

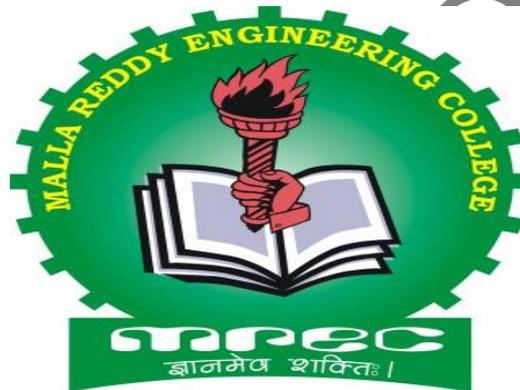


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Maisammaguda(H),Medchal -Malkajgiri District, Secunderabad, Telangana State-500100,www.mrec.ac.in



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II MBA III Semester

Subject

STRATEGIC HUMAN RESOURCE MANAGEMENT

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STRATEGIC MANAGEMENT ACCOUNTING SYLLABUS

UNIT – I

MANAGEMENT ACCOUNTING VS COST ACCOUNTING:

Objectives, advantages and limitations of management accounting and cost accounting, Role of accounting information in planning and control, cost concepts and managerial use of classification of costs, the management process and accounting, cost analysis and control: direct and indirect expenses, allocation and apportionment of overheads, calculation of machine hour rate, introduction to activity based costing and life cycle costing.

UNIT – II

COSTING FOR SPECIFIC INDUSTRIES:

Unit costing, job costing, cost sheet and tender sheet and process costing and their variants, treatment of normal losses and abnormal losses, inter process profits, costing for byproducts and equivalent production, introduction, application of marginal costing in terms of cost control, profit planning, closing down a plant, dropping a product line, charging general and specific fixed costs, fixation of selling price.

UNIT – III

MAKE OR BUY DECISIONS:

Key or limiting factor, selection of suitable product mix, desired level of profits, diversification of products, closing down or suspending activities, level of activity planning.

Break even analysis: application of breakeven point for various business problems, inter firm comparison: need for inter firm comparison, types of comparisons, advantages.

UNIT – IV

BUDGETARY CONTROL:

Budget, budgetary control, steps in budgetary control, flexible budget, different types of budgets: sales budget, cash budget, production budget, master budget, performance budgets, material vs. purchase budgets, zero based budgeting, introduction to cost audit and management audit.

UNIT – V

STANDARD COSTING:

Standard cost and standard costing, standard costing vs. budgetary control, standard costing vs. estimated cost, standard costing and marginal costing analysis of variance, material variance, labor variance, Sales and Profit variance, Case studies.

UNIT-I

MANAGEMENT ACCOUNTING Vs. COST ACCOUNTING

COST ACCOUNTANCY:

This is the widest of all the terms. It is applications of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and ascertainment of profitability.

According to the Institute of Cost and Management Accounts, London, “cost accountancy is the application of costing and cost accounting principles, methods, techniques etc., to the science, art and practice of cost control, cost audit and ascertainment of profitability.”

COST ACCOUNTING:

It is a formal system of accounting for costs by means of which costs of products and services are ascertained and controlled.

COSTING:

Costing is the classifying, recording and appropriate allocation of expenditure for the determination of costs of products or services.

The techniques and processing of ascertainment of costs is known as costing. The technique in costing consists of principles and rules which govern the procedure of ascertaining costs of products or services. This technique is dynamic and changes with time.

DEFINITIONS OF MANAGEMENT ACCOUNTING:

According to Anglo-American Council on Productivity: “Management Accounting is the presentation of accounting information in such a way as to assist management in creation of policy and day-to-day operation of an undertaking.”

According to Robert N. Anthony, “Management Accounting is concerned with accounting information that is useful to management.”

According to Brown and Howard, “The essential aim of management accounting should be to assist management in decision making and control.”

In the words of J. Batty, “Management Accounting is the term used to describe the accounting methods, systems and techniques which coupled with special knowledge and ability, assist management in its task of maximizing profits and minimizing losses.”

According to T.G.Rose, “Management Accounting is the adaptation and analysis of accounting information and its diagnosis and explanation in such a way as to assist management.”

FINANCIAL ACCOUNTING

Accounting is the wider term and includes recording, classifying and summarizing of business transactions in terms of money, the preparation of financial reports, the analysis and interpretation of these reports for the information and guidance of management.

According to the American Institute of Certified Public Accounts, “ Financial Accounting as the art of recording, classifying and summarizing in a significant manner in terms of money transactions and events which in part, at least of financial character and interpreting the results thereof”

American Accounting Association defines accounting as “ the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information

According to Smith and Ashburne,

“Accounting is the science of recording and classifying business transactions and events, primarily of financial character and art of making significant summaries, analysis and interpretations of those transactions and events and communicating the results to persons who must make decisions or form judgements”.

According to committee on terminology of American Institute of Certified Public Accountants (AICPA),

“Accounting is the art of recording, classifying and summarizing in a significant manner and in terms of money transactions and events which are in part, at least of financial character and interpreting the results thereof.”

Differences between Financial Accounting and Management Accounting

Point of Difference	Financial Accounting	Management Accounting
1. Objective	Its main objective is to provide information in the form of profit and loss account and balance sheet to varies interested parties such as shareholders, creditors, bankers, investors, debenture holders, government etc.	Its main objective is to help the management in formulation of policies and plans.

2. Scope	It covers only that information which can be measured in terms of money.	It considers both qualitative information and other information.
3. Nature	It is concerned almost exclusive with historical records i.e., transactions which have already Taken place.	It represents predetermined and as well as post determined information.
4. Subject Matter	It portrays the position of the business as a whole. It assesses the results of the whole business.	It is concerned with the activities of different units, departments and cost centres.
5. Focus	Financial accounting reports reveal what had happened in the past.	It takes into account the past events only to the extent they affect the future position.
6. Precision	In financial accounting all transactions are recorded with actual amounts. There is no room for use of appropriate figures.	In management accounting no emphasis is given to actual figures. Sometimes approximate figures are considered more useful than actual figures to know the trends of the business.
7. Statutory Obligation	The preparation of financial accounting is a statutory obligation. Financial statements should be prepared in the formats prescribed by law.	It is optional. It is upto the management whether to instal it or not.
8. Accounting principles	It is governed by generally accepted accounting principles and conventions.	No such set of accounting principles and conventions are followed in management accounting.
9. Reporting	Financial statements prepared under financial accounts are useful to outsiders like creditors, bankers, debenture holders etc.	Reports prepared under management account are useful for internal management only.
10. Period	Financial accounts are prepared for a particular period of time.	It supplies needed information to the management from time to time thought the year.
11. Communication	Prompt And Quick communication of information and keeping upto date are not desired in financial accounting.	In this, immediate and prompt communication of data is very much required.

12. Audit	Financial statements such as profit and loss account and balance sheet are subject to verification. Under companies Act Auditing is compulsory for financial accounting.	It cannot be audited. As it not based on actual figures. It is not possible to get the management accounts audited.
13. Publication	As per companies Act 1956, every registered company should publish it's final statements for the benefit of public. A copy of the same should be filled with registrar of companies.	Statements and reports prepared under management accounting are meant only for internal management only. Hence, they are not published.

Classification of Cost for Managerial Use

The Cost may be classified in various ways to serve different purposes. Some of the important classifications are as under:

They are

1. By elements
2. As direct or indirect
3. By functional divisions
4. By departments
5. By product
6. As variable, semi-variable and fixed costs.
7. As expenditure being capital or revenue.

The Cost may be classified into eight categories on the basis of managerial Decisions.

They are

1. Marginal cost
2. Out of pocket costs
3. Differential cost
4. Sunk cost

5. Imputed or notional costs
6. Opportunity cost.
7. Replacement cost.
8. Avoidable and Unavoidable cost

1. Marginal Cost:

Marginal cost is the total of variable costs i.e., prime cost plus variable overheads.

It is based on the distinction between fixed and variable costs.

Fixed costs are ignored and only variable costs are taken into consideration for determining cost of products and value of work-in-progress and finished goods.

2. Out of Pocket Costs:

This is that portion of the costs which involves payment to outsiders i.e., gives rise to each expenditure as opposed to such costs as depreciation, which do not involve any cash expenditure. Such costs are relevant for price fixation during recession or when make or buy decision is to be made.

3. Differential Cost:

The change in costs due to change in the level of activity or pattern or method of production is known as differential cost. If the change increases the cost, it will be called incremental cost. If there is decrease in cost resulting from decrease in output, the difference is known as decremental cost.

4. Sunk Cost:

A sunk cost is an irrecoverable cost and is caused by complete abandonment / rejection / leaving of a plant. It is written down value of the abandoned plant less its salvage value. Such costs are not relevant for decision-making and are not affected by increase or decrease in volume / size. Thus, expenditure which has taken place and is irrecoverable in a situation, is treated as sunk cost. For taking managerial decisions with future implications, a sunk cost is an irrelevant cost.

If a decision has to be made for replacing the existing plant, the book value of the plant less salvage value(if any) will be a sunk cost and will be irrelevant cost for taking decision of the replacement of the existing plant.

5. Imputed Costs or Notional Costs:

Imputed costs or notional costs have the same meaning.

The American equivalent term of the British term 'notional cost' is imputed cost.

These costs are notional in nature and do not involve any cash outlay.

The Chartered Accountants, London defines notional cost as “ the value of a benefit where no actual cost is incurred.”

Even though such costs do not involve any cash outlay but are taken into consideration while making managerial decisions.

Examples of such costs are: notional / unreal rent charged on business premises owned by the proprietor, interest on capital for which no interest has been paid.

When alternative capital investment projects are being evaluated it is necessary to consider the imputed interest on capital before a decision is arrived as to which is the most profitable project.

6. Opportunity Cost:

It is the maximum possible alternative earning that might have been earned if the productive capacity or services had been put to some alternative use. In simple words, it is the advantage, in measurable terms which has been foregone due to not using the facility in the manner originally planned.

For example, if an owned building is proposed to be used for a project, the likely rent of building is the opportunity cost which should be taken into consideration while evaluating the profitability of the project.

Similarly, if the fixed deposit in a bank is withdrawn for financing a new project, the loss of interest on such fixed deposit is the opportunity cost.

7. Replacement Cost:

It is the cost at which there could be purchase of an asset or material identical to that which is being replaced or revalued.

It is the cost of replacement at current market price.

8. Avoidable and Unavoidable Cost:

Avoidable costs are those which can be eliminated if a particular product or department, with which they are directly related, is discontinued.

For example, salary of the clerks employed in a particular department can be eliminated, if the department is discontinued.

Unavoidable cost is that cost which will not be eliminated with the discontinuation of a product or department.

For example, salary of factory manager or factory rent cannot be eliminated even if a product is eliminated.

COST ANALYSIS

Cost Accounting

As compared to the financial accounting, the focus of cost accounting is different. In the modern days of cut throat competition, any business organization has to pay attention towards their cost of production. Computation of cost on scientific basis and thereafter cost control and cost reduction has become of paramount importance. Hence it has become essential to study the basic principles and concepts of cost accounting. These are discussed in the subsequent paragraphs.

Cost :- Cost can be defined as the expenditure (actual or notional) incurred on or attributable to a given thing. It can also be described as the resources that have been sacrificed or must be sacrificed to attain a particular objective. In other words, cost is the amount of resources used for something which must be measured in terms of money. For example – Cost of preparing one cup of tea is the amount incurred on the elements like material, labour and other expenses; similarly cost of offering any services like banking is the amount of expenditure for offering that service. Thus cost of production or cost of service can be calculated by ascertaining the resources used for the production or services.

Costing :- Costing may be defined as ‘the technique and process of ascertaining costs’. According to Wheldon, ‘Costing is classifying, recording, allocation and appropriation of expenses for the determination of cost of products or services and for the presentation of suitably arranged data for the purpose of control and guidance of management. It includes the ascertainment of every order, job, contract, process, service units as may be appropriate. It deals with the cost of production, selling and distribution. If we analyze the above definitions, it will be understood that costing is basically the procedure of ascertaining the costs. As mentioned above, for any business organization, ascertaining of costs is must and for this purpose a scientific procedure should be followed. ‘Costing’ is precisely this procedure which helps them to find out the costs of products or services.

Cost Accounting :- Cost Accounting primarily deals with collection, analysis of relevant of cost data for interpretation and presentation for various problems of management. Cost accounting accounts for the cost of products, service or an operation. It is defined as, ‘the establishment of budgets, standard costs and actual costs of operations, processes, activities or products and the analysis of variances, profitability or the social use of funds’.

Cost Accountancy :- Cost Accountancy is a broader term and is defined as, ‘the application of costing and cost accounting principles, methods and techniques to the science and art and practice of cost control and the ascertainment of profitability as well as presentation of information for the purpose of managerial decision making.’

If we analyze the above definition, the following points will emerge,

- A. Cost accounting is basically application of the costing and cost accounting principles.
- B. This application is with specific purpose and that is for the purpose of cost control, ascertainment of profitability and also for presentation of information to facilitate decision making.

- C. Cost accounting is a combination of art and science; it is a science as it has well defined rules and regulations, it is an art as application of any science requires art and it is a practice as it has to be applied on continuous basis and is not a onetime exercise.

OBJECTIVES OF COST ACCOUNTING

Objectives of Cost Accounting can be summarized as under

1. To ascertain the cost of production on per unit basis, for example, cost per kg, cost per meter, cost per liter, cost per ton etc.
2. Cost accounting helps in the determination of selling price. Cost accounting enables to determine the cost of production on a scientific basis and it helps to fix the selling price.
3. Cost accounting helps in cost control and cost reduction.
4. Ascertainment of division wise, activity wise and unit wise profitability becomes possible through cost accounting.
5. Cost accounting also helps in locating wastages, inefficiencies and other loopholes in the production processes/services offered.
6. Cost accounting helps in presentation of relevant data to the management which helps in decision making. Decision making is one of the important functions of Management and it requires presentation of relevant data. Cost accounting enables presentation of relevant data in a systematic manner so that decision making becomes possible.
7. Cost accounting also helps in estimation of costs for the future.

ESSENTIALS OF A GOOD COSTING SYSTEM:

For availing of maximum benefits, a good costing system should possess the following characteristics.

1. Costing system adopted in any organization should be suitable to its nature and size of the business and its information needs.
2. A costing system should be such that it is economical and the benefits derived from the same should be more than the cost of operating of the same.
3. Costing system should be simple to operate and understand. Unnecessary complications should be avoided.
4. Costing system should ensure proper system of accounting for material, labour and overheads and there should be proper classification made at the time of recording of the transaction itself.
5. Before designing a costing system, need and objectives of the system should be identified.
6. The costing system should ensure that the final aim of ascertaining of cost as accurately possible should be achieved.

Certain Important Terms: It is necessary to understand certain important terms used in cost accounting.

A. Cost Centre: Cost Center is defined as, 'a production or service, function, activity or item of equipment whose costs may be attributed to cost units. A cost center is the smallest organizational sub unit for which separate cost allocation is attempted'. To put in simple words, a cost center is nothing but a location, person or item of equipment for which cost may be ascertained and used for the purpose of cost control. For example, a production department, stores department, sales department can be cost centers. Similarly, an item of equipment like a lathe, fork-lift, truck or delivery vehicle can be cost center, a person like sales manager can be a cost center. The main object of identifying a cost center is to facilitate collection of costs so that further accounting will be easy. A cost center can be either personal or impersonal, similarly it can be a production cost center or service cost centre. A cost center in which a specific process or a continuous sequence of operations is carried out is known as Process Cost Center.

B. Profit Centre: Profit Center is defined as, 'a segment of the business entity by which both revenues are received and expenses are incurred or controlled'. (CEMA) A profit centre is any sub unit of an organization to which both revenues and costs are assigned. As explained above, cost centre is an activity to which only costs are assigned but a profit centre is one where costs and revenues are assigned so that profit can be ascertained. Such revenues and expenditure are being used to evaluate segmental performance as well as managerial performance. A division of an organization may be called as profit center. The performance of profit centre is evaluated in terms of the fact whether the centre has achieved its budgeted profits. Thus the profit centre concept is used for evaluation of performance.

Costing Systems : There are different costing systems used in practice. These are described below.

A. Historical Costing :- In this system, costs are ascertained only after they are incurred and that is why it is called as historical costing system. For example, costs incurred in the month of April, 2007 may be ascertained and collected in the month of May. Such type of costing system is extremely useful for conducting post-mortem examination of costs, i.e. analysis of the costs incurred in the past. Historical costing system may not be useful from cost control point of view but it certainly indicates a trend in the behaviour of costs and is useful for estimation of costs in future.

B. Absorption Costing :- In this type of costing system, costs are absorbed in the product units irrespective of their nature. In other words, all fixed and variable costs are absorbed in the products. It is based on the principle that costs should be charged or absorbed to whatever is being costed, whether it is a cost unit, cost center.

C. Marginal Costing :- In Marginal Costing, only variable costs are charged to the products and fixed costs are written off to the Costing Profit and Loss A/c. The principle followed in this case is that since fixed costs are largely period costs, they should not enter into the production units. Naturally, the fixed costs will not enter into the inventories and they will be valued at marginal costs only.

D. Uniform Costing :- This is not a distinct method of costing but is the adoption of identical costing principles and procedures by several units of the same industry or by several undertakings by mutual agreement. Uniform costing facilitates valid comparisons between organizations and helps in eliminating inefficiencies.

CLASSIFICATION OF COSTS / COST ANALYSIS

An important step in computation and analysis of cost is the classification of costs into different types. Classification helps in better control of the costs and also helps considerably in decision making. Classification of costs can be made according to the following basis.

A. Classification according to elements: - Costs can be classified according to the elements. There are three elements of costing, viz. material, labor and expenses. Total cost of production/ services can be divided into the three elements to find out the contribution of each element in the total costs.

B. Classification according to nature :- As per this classification, costs can be classified into Direct and Indirect. Direct costs are the costs which are identifiable with the product unit or cost centre while indirect costs are not identifiable with the product unit or cost centre and hence they are to be allocated, apportioned and then absorbed in the production units. All elements of costs like material, labor and expenses can be classified into direct and indirect. They are mentioned below.

i. Direct and Indirect Material :- Direct material is the material which is identifiable with the product. For example, in a cup of tea, quantity of milk consumed can be identified, quantity of glass in a glass bottle can be identified and so these will be direct materials for these products. Indirect material cannot be identified with the product, for example lubricants, fuel, oil, cotton wastes etc cannot be identified with a given unit of product and hence these are the examples of indirect materials.

ii. Direct and Indirect Labour :- Direct labour can be identified with a given unit of product for example, when wages are paid according to the piece rate, wages per unit can be identified. Similarly wages paid to workers who are directly engaged in the production can also be identified and hence they are direct wages. On the other hand, wages paid to workers like sweepers, gardeners, maintenance workers etc are indirect wages as they cannot be identified with the given unit of production.

iii. Direct and Indirect Expenses: - Direct expenses refer to expenses that are specifically incurred and charged for specific or particular job, process, service, cost centre or cost unit. These expenses are also called as chargeable expenses. Examples of these expenses are cost of drawing, design and layout, royalties payable on use of patents, copyrights etc, consultation fees paid to architects, surveyors etc. Indirect expenses on the other hand cannot be traced to specific product, job, process, service or cost centre or cost unit. Several examples of indirect expenses can be given like insurance, electricity, rent, salaries, advertising etc. It should be noted that the total of direct expenses is known as 'Prime Cost' while the total of all indirect expenses is known as 'Overheads'.

C. Classification according to behaviour: - Costs can also be classified according to their behaviour. This classification is explained below.

i. Fixed Costs: - Out of the total costs, some costs remain fixed irrespective of changes in the production volume. These costs are called as fixed costs. The feature of these costs is that the total costs remain same while per unit fixed cost is always variable. Examples of these costs are salaries, insurance, rent, etc.

ii. Variable Costs: - These costs are variable in nature, i.e. they change according to the volume of production. Their variability is in the same proportion to the production. For example, if the production units are 2,000 and the variable cost is Rs. 5 per unit, the total Variable cost will be Rs. 10,000, if the production units are increased to 5,000 units, the total variable costs will be Rs. 25,000, i.e. the increase is exactly in the same proportion of the production. Another feature of the variable cost is that per unit variable cost remains same while the total variable costs will vary. In the example given above, the per unit variable cost remains Rs. 5 per unit while total variable costs change. Examples of variable costs are direct materials, direct labour etc.

iii. Semi-variable Costs: Certain costs are partly fixed and partly variable. In other words, they contain the features of both types of costs. These costs are neither totally fixed nor totally variable. Maintenance costs, supervisory costs etc are examples of semi-variable costs. These costs are also called as 'stepped costs'.

D. Classification according to functions: Costs can also be classified according to the functions/ activities. This classification can be done as mentioned below:

i. Production Costs: All costs incurred for production of goods are known as production costs.

ii. Administrative Costs: Costs incurred for administration are known as administrative costs. Examples of these costs are office salaries, printing and stationery, office telephone, office rent, office insurance etc.

iii. Selling and Distribution Costs :- All costs incurred for procuring an order are called as selling costs while all costs incurred for execution of order are distribution costs.

Market research expenses, advertising, sales staff salary, sales promotion expenses are some of the examples of selling costs. Transportation expenses incurred on sales, warehouse rent etc are examples of distribution costs.

iv. Research and Development Costs: In the modern days, research and development has become one of the important functions of a business organization. Expenditure incurred for this function can be classified as Research and Development Costs.

E. Classification according to time: Costs can also be classified according to time. This classification is explained below:

i. Historical Costs: These are the costs which are incurred in the past, i.e. in the past year, past month or even in the last week or yesterday. The historical costs are ascertained after the period is over. In other words it becomes a post-mortem analysis of what has happened in the past. Though historical costs have limited importance, still they can be used for estimating the trends of the future, i.e. they can be effectively used for predicting the future costs.

ii. Predetermined Cost: These costs relating to the product are computed in advance of production, on the basis of a specification of all the factors affecting cost and cost data. Predetermined costs may be either standard or estimated. Standard Cost is a predetermined calculation of how much cost should be under specific working conditions. It is based on technical studies regarding material, labour and expenses. The main purpose of standard cost is to have some kind of benchmark for comparing the actual performance with the standards. On the other hand, estimated costs are predetermined costs based on past performance and adjusted to the anticipated changes. It can be used in any business situation or decision making which does not require accurate cost.

F. Classification of costs for Management decision making: - One of the important functions of cost accounting is to present information to the Management for the purpose of decision making. For decision making certain types of costs are relevant. Classification of costs based on the criteria of decision making can be done in the following manner:

Marginal Cost: Marginal cost is the change in the aggregate costs due to change in the volume of output by one unit. For example, suppose a manufacturing company produces 10,000 units and the aggregate costs are Rs. 25,000, if 10,001 units are produced the aggregate costs may be Rs. 25,020 which means that the marginal cost is Rs. 20. Marginal cost is also termed as variable cost and hence per unit marginal cost is always same, i.e. per unit marginal cost is always fixed. Marginal cost can be effectively used for decision making in various areas.

II. Differential Costs: Differential costs are also known as incremental cost.

III. Opportunity Costs: It is the value of benefit sacrificed in favour of an alternative course

of action. It is the maximum amount that could be obtained at any given point of time if a resource was sold or put to the most valuable alternative use that would be practicable. Opportunity cost of goods or services is measured in terms of revenue which could have been earned by employing that goods or services in some other alternative uses.

IV. Relevant Cost: The relevant cost is a cost which is relevant in various decisions of management. Decision making involves consideration of several alternative courses of action. In this process, whatever costs are relevant are to be taken into consideration. In other words, costs which are going to be affected matter the most and these costs are called as relevant costs. Relevant cost is a future cost which is different for different alternatives. It can also be defined as any cost which is affected by the decision on hand. Thus in decision making relevant costs plays a vital role.

V. Replacement Cost: This cost is the cost at which existing items of material or fixed assets can be replaced. Thus this is the cost of replacing existing assets at present or at a future date.

VI. Abnormal Costs: It is an unusual or a typical cost whose occurrence is usually not regular and is unexpected. This cost arises due to some abnormal situation of production. Abnormal cost arises due to idle time, may be due to some unexpected heavy breakdown of machinery. They are not taken into consideration while computing cost of production or for decision making.

VII. Controllable Costs: - In cost accounting, cost control and cost reduction are extremely important. In fact, in the competitive environment, cost control and reduction are the key words. Hence it is essential to identify the controllable and uncontrollable costs. Controllable costs are those which can be controlled or influenced by a conscious management action. For example, costs like telephone, printing stationery etc can be controlled while costs like salaries etc cannot be controlled at least in the short run. Generally, direct costs are controllable while uncontrollable costs are beyond the control of an individual in a given period of time.

VIII. Shutdown Cost: These costs are the costs which are incurred if the operations are shut down and they will disappear if the operations are continued. Examples of these costs are costs of sheltering the plant and machinery and construction of sheds for storing exposed property. Computation of shutdown costs is extremely important for taking a decision of continuing or shutting down operations.

IX. Capacity Cost: These costs are normally fixed costs. The cost incurred by a company for providing production, administration and selling and distribution capabilities in order to perform various functions. Capacity costs include the costs of plant, machinery and building for production, warehouses and vehicles for distribution and key personnel for administration. These costs are in the nature of long-term costs and are incurred as a result of planning decisions.

X. Urgent Costs: These costs are those which must be incurred in order to continue operations of the firm. For example, cost of material and labour must be incurred if production is to take place.

COST ANALYSIS AND COST CONTROL

INTRODUCTION TO COST CONTROL:

Cost Control has been defined as the guidance and regulation by execution action of the costs of operating and under taking. It is regarded as an important derivative of cost accounting is inseparably connected with cost control with the help of cost data.

CLASSIFICATION OF COST CONTROL:

1. Physical cost control – control over production and distribution.
2. Managerial cost control- the use of cost data for regulating current operations.
3. Mechanics cost control-the accounting techniques which are involved in providing for cost control.

STEPS IN COST CONTROL:

1. Target should be set up for expenses and performance.
2. The actual expenses and production performances should be measured periodically.
3. Actual cost should be compared with the targets with a view to find out the deviations.
4. Variations if any should be analysed by cases.
5. Corrective actions should be taken to eliminate the variations.

Cost control is essential for a manufacturing organization because, it aims at guiding the actual costs towards the line of targets regulates the actual if they deviate from targets. This guidance and regulation is done by a management action. A suitable cost control system helps in maintaining expected return on capital employed, increasing productivity of men, machines and other resources, fixing a reasonable price for customers and increasing the economic stability of the manufacturing organization.

DIRECT AND INDIRECT EXPENSES

Direct expenditure also known as chargeable expenses includes all such expenditure other than expenses on direct material and labour that can be directly identified with cost unit examples of direct expenses are architect or surveyors fees. Cost of drawings and patterns, royalty, repairs and maintenance of plant obtained on hire etc.

Indirect expenses are also called overhead. They are also referred to as on cost. They include material, indirect labour and other expenses, which cannot be directly charged to specific cost units. The overheads can be divided into three categories.

1. Factory Overheads:

Factory overheads include all indirect expenses, which are connected with manufacturing of a product. When they are allocated to different cost units they are referred to as factory on cost or works on cost. Examples of factory overheads are salary of factory manager, supervisor's salary, factory rent and rates and factory insurance etc.

2. Administrative Overheads:

Administrative overheads include all indirect expenses relating to enter price. They are also called as office overheads or office on cost. They include expenses incurred towards formulation of policies, planning and controlling the functions and motivating the personnel of organization.

3. Selling and Distribution Overheads:

Selling and distribution overheads are indirect expenses connected with marketing and sales. Selling expenses are incurred in securing and retaining customers. Salaries and commission of sales managers and salesmen, training expenses, cost of samples, catalogues, price lists, exhibition and demonstrating expenses, market research expenses and expenses incurred on entertaining customers. Distribution expenses are expenses incurred in ensuring that the products are available at all potential points of sale. They include expenses on handling the products from the time they are placed in the Warehouse until they reach their destination. Examples of distribution overheads are cost of warehousing, packing and loading charges etc.

ACTIVITY BASED COSTING

Activity based costing is the method for estimating the resources required to operate an organization's business processes, produce its products and serve its customers.

Characteristics of ABC Costing:

Simple traditional distinction made between fixed and variable cost is not enough guide to provide quality information to design a cost system.

The more appropriate distinction between cost behaviour patterns are volume related, diversity related and time related.

Cost drivers need to be identified.

BENEFITS OF ACTIVITY BASED COSTING:

1. Identify the most profitable customers, products and channels.
2. Identify the least profitable customers, products and channels.
3. Determine the true contributors to and detractors from financial performance.
4. Accurately predict costs, profits and resources requirements associated with changes in production volumes, organizational structure and costs of resources.
5. Easily identify the root causes of poor financial performance.
6. Track costs of activities and work processes.
7. Equip managers with cost intelligence to stimulate improvements.
8. Facilitate a better Marketing Mix.
9. Enhance the bargaining power with the customers.
10. Achieve better positioning of products.

LIMITATIONS OF ACTIVITY BASED COSTING:

1. Allocation:

Not all costs have been appropriated activity or resource consumption cost drivers. Some costs require allocations to departments and pre-cuts based on arbitrary volume measures because finding the activity that causes because finding the activity that causes the cost is impractical. Eg. Faculty sustaining costs such as cost of information system, factory manager's salary, factory insurance etc.

2. Omission of costs:

Product or service costs identified by ABC System are likely to not include all costs associated with the product or service. Product or service costs typically do not include costs for such activities as marketing, advertising, research and development and product engineering even though some these costs can be traced to individual products or services. Product costs do not include these costs because generally accepted accounting principles (GAAP) for financial reporting requires them to be treated as period costs.

3. Expense and Time:

An ABC System is not cost free and is time consuming to develop and implement. For firms or organizations that have been using a traditional volume based costing, installing a new ABC System is likely to be very expensive. Furthermore, like most innovative management or accounting system. ABC usually requires a year or longer for successful development and implementation.

LIFE CYCLE COSTING

Life cycle costing is also called whole life costing is technique to establish the total cost of ownership. It is a structured approach that addresses all the elements of this cost and can be used to produce a spend profile of the product or services over its anticipated life span.

The results of an LCC analysis can be used to assist management in the decision making process where there is a choice of options. The accuracy of LCC analysis diminishes as it projects further into the future, so it is most valuable as a comparative tool when long term assumptions apply to all the opinions and consequently have the same impact.

LCC is a system that tracks and accumulates the actual costs and revenues attributable to cost object from its invention to its abandonment. It involves tracing cost and revenues on a product by product basis over several calendar periods.

LIFE CYCLE COST:

Life cycle cost are incurred both ;

i) Product and services from design stage through development to market launch, production and sale and their eventual withdrawal from market and

ii) Fixed costs i.e., capital equipment.

The component elements of a product cost over its life cycle should include:

- Acquisition cost- costs of research design, testing. Production, construction or purchase in case of capital equipment.
- Product distribution-transport and handling.
- Maintenance cost-cost as customer service, field maintenance and in factory maintenance.
- Operation cost-the costs incurred in operations such as energy costs and various faculty and other utility costs.
- Training- operators and maintenance training.
- Retirement and disposal-cost at the end of product's life or life of capital equipment.

BENEFITS OF LCC ANALYSIS:

1. Option Evaluation:

LCC techniques allow evaluation of competing proposals on the basis of life costs. LCC analysis is relevant to most service contracts and equipment purchasing decisions.

2. Improved Awareness:

Application of LCC techniques provides management with an improved awareness of the factors that drive cost and resources the required by the purchase. It is important that the cost drives are identified so that most of management effort is applied to the most cost effective area of purchase. Additionally awareness of the cost drives will also highlight areas in existing items which would benefit from management involvement.

3. Improved Forecasting:

The application of LCC technique allows the full cost associated with a procurement to be estimated more accurately. It leads to improved decision making at all levels for example major investment decisions or establishment of cost effective support policies. Additionally, LCC analysis allows more accurate forecasting of future expenditure to be applied to long-term costing assessment.

4 Performance Trade off against cost:

In purchasing decisions cost is not the only factor to be considered when assessing the options. There are other factors such as the overall fit against the requirement

and the quality of goods and the levels of service to be provided. LCC analysis allows for a cost trade-off to be made against the varying attributes of the purchasing options.

. LIFE CYCLE COSTING AND MANAGEMENT CONTROL:

When life cycle costing is used for capital investment appraisal, the aim of life cycle management then switches to control i.e., monitoring actual life cycle costs and comparing them with the expected costs. Control action might consist of action to reduce costs of existing asset, but it will also include

- i) Action to improve the design or specifications for future capital purchases and
- ii) Action to improve the life cycle costing techniques that are being used so that future capital asset purchase decision will be better.

MRECMBA

UNIT-II

COSTING FOR SPECIFIC INDUSTRIES

1. JOB COSTING

As mentioned in the above paragraph, the methods of costing are used to ascertain the cost of product or service offered by a business organization. There are two principle methods of costing. These methods are as follows:

- I] Job Costing
- II] Process Costing

Other methods of costing are the variations of these two principle methods. The variations of these methods of costing are as follows.

- I] Job Costing: Batch Costing, Contract Costing, Multiple Costing.
 - II] Process Costing: Unit or Single Output Costing, Operating Costing, Operation Costing
- The Job Costing and its variations are discussed in detail in the following paragraphs:

I] **Job Costing:** This method of costing is used in Job Order Industries where the production is as per the requirements of the customer. In Job Order industries, the production is not on continuous basis rather it is only when order from customers is received and that too as per the specific cautions of the customers. Consequently, each job can be different from the other one. Method used in such type of business organizations is the Job Costing or Job Order Costing. The objective of this method of costing is to work out the cost of each job by preparing the Job Cost Sheet. A job may be a product, unit, batch, sales order, project, contract, service, specific program or any other cost objective that is distinguishable clearly and unique in terms of materials and other services used. The cost of completed job will be the materials used for the job, the direct labour employed for the same and the production overheads and other overheads if any charged to the job.

Features of Job Costing:

- 1) It is a specific order costing
- 2) A job is carried out or a product is produced is produced to meet the specific requirements of the order.
- 3) Job costing enables a business to ascertain the cost of a job on the basis of which quotation for the job may be given.
- 4) While computing the cost, direct costs are charged to the job directly as they are traceable to the job.
- 5) Indirect expenses i.e. overheads are charged to the job on some suitable basis.

- 6) Each job completed may be different from other jobs and hence it is difficult to have standardization of controls and therefore more detailed supervision and control is necessary.
- 7) At the end of the accounting period, work in progress may or may not exist.

Methodology used in Job Costing:

As discussed above, the objective of job costing is to ascertain the cost of a job that is produced as per the requirements of the customers. Hence it is necessary to identify the costs associated with the job and present it in the form of job cost sheet for showing various types of costs. Various costs are recorded in the following manner.

1. Direct Material Costs: Material used during the production process of a job and identified with the job is the direct material. The cost of such material consumed is the direct material cost. Direct material cost is identifiable with the job and is charged directly. The source document for ascertaining this cost is the material requisition slip from which the quantity of material consumed can be worked out. Cost of the same can be worked out according to any method of pricing of the issues like first in first out, last in first out or average method as per the policy of the organization. The actual material cost can be compared with standard cost to find out any variations between the two. However, as each job may be different from the other, standardization is difficult but efforts can be made for the same.

2. Direct Labour Cost: This cost is also identifiable with a particular job and can be worked out with the help of 'Job Time Tickets' which is a record of time spent by a worker on a particular job. The 'job time ticket' has the record of starting time and completion time of the job and the time required for the job can be worked out easily from the same. Calculation of wages can be done by multiplying the time spent by the hourly rate. Here also standards can be set for the time as well as the rate so that comparison between the standard cost and actual cost can be very useful.

3. Direct Expenses: Direct expenses are chargeable directly to the concerned job. The invoices or any other document can be marked with the number of job and thus the amount of direct expenses can be ascertained.

4. Overheads: This is really a challenging task as the overheads are all indirect expenses incurred for the job. Because of their nature, overheads cannot be identified with the job and so they are apportioned to a particular job on some suitable basis. Pre determined rates of absorption of overheads are generally used for charging the overheads. This is done on the basis of the budgeted data. If the predetermined rates are used, under/over absorption of overheads is inevitable and hence rectification of the same becomes necessary.

5. Work in Progress: On the completion of a job, the total cost is worked out by adding the overhead expenses in the direct cost. In other words, the overheads are added to the prime cost. The cost sheet is then marked as 'completed' and proper entries are made in the finished goods ledger. If a job remains incomplete at the end of an accounting period, the total cost incurred on the same becomes the cost of work in progress. The work in progress at the end of the accounting period becomes the closing work in progress and the same becomes

the opening work in progress at the beginning of the next accounting period. A separate account for work in progress is maintained in the books of business concern..

Advantages of Job Costing:

The following are the advantages of job costing.

1. Accurate information is available regarding the cost of the job completed and the profits generated from the same.
2. Proper records are maintained regarding the material, labor and overheads so that a costing system is built up.
3. Useful cost data is generated from the point of view of management for proper control and analysis.
4. Performance analysis with other jobs is possible by comparing the data of various jobs. However it should be remembered that each job completed may be different from the other.
5. If standard costing system is in use, the actual cost of job can be compared with the standard to find out any deviation between the two.
6. Some jobs are priced on the basis of cost plus basis. In such cases, a profit margin is added in the cost of the job. In such situation, a customer will be willing to pay the price if the cost data is reliable. Job costing helps in maintaining this reliability and the data made available becomes credible.

Limitations of Job Costing:

Job costing suffers from certain limitations.

These are as follows.

- i. It is said that it is too time consuming and requires detailed record keeping. This makes the method more expensive.
- ii. Record keeping for different jobs may prove complicated.
- iii. Inefficiencies of the organization may be charged to a job though it may not be responsible for the same.

In spite of the above limitations, it can be said that job costing is an extremely useful method for computation of the cost of a job. The limitation of time consuming can be removed by computerization and this can also reduce the complexity of the record keeping.

INTER-PROCESS PROFITS

The output of one process is transferred to the subsequent process at cost price. However sometimes, the transfer is made at cost + certain percentage of profit. This is done when each process is treated as a profit centre. In such cases, the difference between the debit and credit side of the process account represents profit or loss and is transferred to the Profit and Loss Account. The stocks at the end and at the beginning contain an element of unrealized profits, which have to be written back in this method. If the profit element contained in the closing

inventory is more than the profit element in the opening inventory, profit will be overstated and vice versa. Profit is realized only on the goods sold, thus to obtain the actual profit the main task would be to calculate the profit element contained in the inventories. In order to compute the profit element, in closing inventory and to obtain the net realized profit for a period, three columns have to be shown in the ledger for showing the cost, unrealized profit and the transfer price.

Costing / Accounting for by-products

By-products are jointly produced products of minor importance and do not have separate costs until the split off point. They are not produced intentionally but are emerging out of the manufacturing process of the main products. The following methods are used for accounting of by-products. The methods are broadly divided into Non-Cost Methods and Cost Methods.

Non-Cost Methods: The following methods are included in this category.

Other income or miscellaneous income method: Under this method, sales value of by-products is credited to the Profit and Loss Account and no credit is given in the cost accounts. The credit to the profit and loss account is treated as other income or miscellaneous income. No effort is made for ascertaining the cost of the product. No valuation of inventory is made and all costs and expenses are charged to the main product. This is the least scientific method and is used where the sales value of the by-product is negligible.

II. **Total sales less total cost:** Under this method, sales value of by-product is added to the sales value of the main product. Further the total cost of the main product including the cost of the by-product is deducted from the sales revenue of the main product and by-product. All costs and expenses are charged to the main product.

III. **Total cost less sales value of by-product:** In this method, the total cost of production is reduced by the sales value of the by-product. This method seems to be more acceptable because like waste and scrap, by-product revenue reduces the cost of major products.

IV. **Total cost less sales value of by-products after setting off selling and distribution overheads of by-products:** Sales value of the by-product minus the selling and distribution overheads of by-product is deducted from the total cost. Selling and distribution overheads are charged against by-products actually sold.

V. **Reverse cost method:** This method is based on the view that the sales value of the by-product contains an element of profit. It is agreed that this element of profit should not be credited to the profit and loss account. The cost of by-product is arrived at by working backwards. Selling price of the by-product is deflated by an assumed gross profit margin. Thus under this method, sales value of the by-product is first reduced by, an estimated profit margin, selling and distribution expenses and then the post split off costs and then the cost of the main product is thus reduced by this net figure.

Cost Methods: The following methods are included in this category.

I. Replacement or opportunity cost method: If the by-products are consumed actively, they are valued at the opportunity cost method or replacement cost method. This means the cost which would have been incurred had the by-product been purchased from outside. For example, biogases, which is one of the main by-product of sugar industry and which is used for the factory as a fuel in the boiler is valued at the market value, i.e. the price that would have been paid if it would have been purchased from outside.

II. Standard cost method: Under this method, the by-product is valued at the standard cost determined for each product. The standard cost may be based on technical assessment. Standard cost of the by-product is credited to the process account of the main product. Accordingly, the cost control of main product can be exercised effectively.

III. Joint cost proration: Where the by-product is of some significance, it is appropriate that the joint costs should be apportioned between the main products and by-products on a most suitable and acceptable method. Thus in this method, no distinction is made between the joint product and by-product. Industries, where the by-products are quite important, use this method. For example, in a petroleum refinery, gas was earlier considered as a by-product. Now it has assumed the importance like petrol, diesel etc. and is being treated as joint product. Accordingly, the joint cost is prorated between the joint product and the by-product.

2. PROCESS COSTING

Process costing is probably the most widely used method of costing. It is used in mass production industries producing standard products such as cement, sugar, steel, oil refining etc. In such industries goods produced are identical and processes are standardized. In these industries, for manufacturing a product, the raw material has to pass through several distinct stages of manufacture in a predetermined sequence. Each such stage of manufacture is called a "process".

The goods produced are identical and all factory processes are standardized.

Method of cost ascertainment in such industries is known as process costing in which costs are compiled for each process by preparing a separate account of such process.

CHARACTERISTICS OF PROCESS COSTING

1. The production is continuous and the final product is the result of a sequence of processes.
2. Costs are accumulated by processes.
3. The products are standardized and homogeneous.

4. The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced.
5. The finished product of each but last process becomes the input for the next process in sequence and that of the last process is transferred to the finished goods stock.
6. The sequence of operations or processes is specific and pre-determined.
7. Some loss of materials in processes (due to chemical action, evaporation etc.,) is unavoidable.
8. Processing of raw materials may give rise to the production of several products.
9. These several products produced from the same raw material may be termed as joint products or by-products.

ADVANTAGES OF PROCESS COSTING

The following are the main advantages of process costing:

1. It is possible to determine process costs periodically at short intervals.
2. Unit cost can be computed weekly or even daily if overhead rates are used on Pre-determined basis.
3. It is simple and less expensive to find out the process cost.
4. It is possible to have managerial control by evaluating the performance of each Process.
5. It is easy to allocate the expenses to processes in order to have accurate costs.
6. It is easy to quote the prices with standardization of process. Standard costing can be established easily in process type of manufacture.

DISADVANTAGES OF PROCESS COSTING

The following are the main disadvantages of Process Costing.

1. Costs obtained at the end of the accounting period are only of historical value and are not very useful for effective control.
2. Work- in- progress is required to be ascertained at the end of an accounting period for calculating the cost of continuous process. Valuation of work- in-progress is generally done on estimated basis which introduces further inaccuracies in total cost.
3. Where different products arise in the same process and common costs are prorated to various cost units. Such individual products' costs may be taken as only approximation and hence not reliable but may be taken as the best.

4. There is a wide scope of errors while calculating average costs. An error in one average cost will be carried through all processes to the valuation of work in process and finished goods.

5. The computation of average cost is more difficult in those cases where more than one type of products are manufactured and a division of cost elements is necessary.

PROBLEMS ON COST SHEET

Single or Output Costing:

Q1. Prepare a cost sheet and calculate the percentage of works expenses of office expenses to direct wages and the percentage office expenses to works cost from the following

1	Stock of raw materials	1-1-2010	30,500
2	Stock of finished goods	1-1-2010	20,400
3	Stock of raw materials	31-1-2010	48,500
4	Stock of finished goods	31-1-2010	10,000
5	Purchase of raw materials		25,000
6	stock of work in progress	1-1-2010	8,000
7	stock of work in progress	31-1-2010	9,000
8	Sales		95,000
9	Direct wages		20,400
10	Factory expenses		10,500
11	Office expenses		5,400
12	Selling & Distribution expenses		6,300

Solution:

Cost sheet at the month ended 31-1-2010

Particulars	I.C	O.C
opening stock of raw materials	30,500	
<u>Add:</u> Purchase of raw materials	25,000	
	55,500	
<u>Less:</u> closing stock of materials	48,500	
COST OF MATERIAL CONSUMED		7,000
<u>Add:</u> direct wages		20,400
PRIME COST		27,400
<u>Add:</u> factory Overheads		10,500
		37,900
<u>Add:</u> opening stock in WIP		8,000
		45,900
<u>Less:</u> closing stock in WIP		9,000
FACTORY/ WORKS COST		36,900
<u>Add:</u> office overheads		5,400
COST OF PRODUCTION		42,300
<u>Add:</u> opening stock of finished goods		20,400
		62,700
<u>Less:</u> closing stock of finished goods		10,000
COST OF GOODS SOLD		52,700
<u>Add:</u> Selling & distribution overheads		6,300
TOTAL COST		59,000
Profit		36,000
SALES		95,000

- i) Calculation of percentage of works expenses to direct wages

$$\% \text{ of office expenses} = \frac{\text{office expenses}}{\text{works cost}} \times 100 = \frac{10,500}{20,400} \times 100 = 51.47\%$$

- ii) Calculation of % of office expenses to work cost

$$\% \text{ of office expenses} = \frac{\text{office expenses}}{\text{works cost}} \times 100 = \frac{5,400}{36,900} \times 100 = 14.63\%$$

Detailed cost sheet:

Q2. Prepare a cost sheet for the month ended from the following information.

	Particulars	Amount
1	Opening stock of material	50,000
2	Purchases	20,000
3	Carriage inwards	40,000
4	Octroi & custom charges	6,000
5	Closing stock of raw material	10,000
6	Productive wages	8,000
7	Chargeable expenses/direct expenses	2,000
8	Indirect material	6,000
9	Indirect wages	4,000
10	Leave wages	5,000
11	Overtime premium	8,000
12	Fuel & power	2,000
13	Coal & coke	4,000
14	Factory rent	6,000
15	Factory insurance	4,000
16	Factory lighting	6,000
17	Supervision	5,000
18	Canteen & welfare	4,000
19	Haulage	6,000
20	Work salaries	10,000
21	Drawing off salaries	5,000
22	Gas & water	1,000
23	Laboratory expenses	7,000
24	Internal transport expenses	1,000
25	Sale & scrap	5,000
26	Opening stock of WIP	10,000
27	Closing stock of WIP	5,000
28	Office salaries	20,000
29	Directors fees	10,000
30	Depreciation on office furniture	5,000
31	Subscription to trade journals	2,000
32	Establishment charges	3,000
33	Legal charges	6,000
34	Postage & telegram	4,000
35	Audit fee	3,000
36	Opening stock of finished goods	10,000
37	Closing stock of finished goods	6,000
38	Advertisement	4,000
39	Showroom expenses	6,000
40	Bad debts	5,000
41	Carriage outwards	6,000
42	Counting house salaries	10,000
43	Warehouse rent	4,000
44	Expenses of sales branches	6,000
45	Sales	3,00,000

46	Provision for bad debts	10,000
47	Interest paid	5,000
48	Donations	20,000
49	Income tax paid	5,000
50	Cash discount	7,000

Sol: DETAILED COST SHEET

Particulars	I.C	O.C
opening stock of materials	50,000	
Add: Purchases	20,000	
Add: carriage inwards	5,000	
Add: octrai& custom charges	6,000	
	81,000	
Less: closing stock of materials	10,000	
COST OF MATERIAL		
CONSUMED		71,000
Add: productive wages	8,000	
Add: chargeable expenses	2,000	
		10,000
PRIME COST		81,000
<u>Add: factory Overheads</u>		
indirect material	6,000	
leave wages	5,000	
indirect wages	4,000	
overtime premium	8,000	
fuel & power	2,000	
cole& coke	4,000	
factory rent	6,000	
factory insurance	4,000	
Supervision	5,000	
canteen expenses	4,000	
Haulage	6,000	
work salaries	10,000	
drawing of salaries	5,000	
gas & water	1,000	
laboratory expenses	7,000	
internal transport expenses	1,000	
	84,000	
Less: sale of scrap	5,000	
	79,000	
Add: opening stock in WIP	10,000	
	89,000	
Less: closing stock in WIP	5,000	

		84,000
	FACTORY/ WORKS COST	1,65,000
<u>Add: office overheads</u>		
office salaries	20,000	
directors fees	10,000	
depreciation on office furniture	5,000	
subscription to trade journals	2,000	
establishment charges	3,000	
legal charges	6,000	
postage & telegram	4,000	
audit fees	3,000	
	COST OF PRODUCTION	53,000
Add: opening stock of finished goods	10,000	
		63,000
Less: closing stock of finished goods	6,000	
		57,000
	COST OF GOODS SOLD	2,22,000
<u>Add: Selling & distribution overheads</u>		
Advertisement	4,000	
showroom expenses	6,000	
bad debts	5,000	
carriage outwards	6,000	
counting house salaries	10,000	
warehouse rent	4,000	
expenses of sales branches	6,000	
		41,000
	TOTAL COST	2,63,000
	profit	37,000
	SALES	3,00,000

TENDER SHEET PROBLEM:

Q. E ltd. company furnishes the following information for 10,000units of a product manufactured during the year 2007

Materials	90,000
Direct wages	60,000
Power & consumable stores	12,000
Indirect wages	15,000
Factory lighting	5,500
Cost of rectification of defective work	3,000
Clerical salaries & management expenses	33,500
Selling expenses	5,500
Sale of scrap	2,000

Repairs & depreciation on P&M	11,500
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Other information:

1. Net selling price was 31.60p.u sold & all units were sold
2. As from 1-1-2008, the selling price was reduced to Rs.31 p.u. It was estimated that production could be increased in 2008 by 50% due to spare capacity.
3. Rates for materials & direct wages will increase by 10%.

You are required to prepare

- i. Cost sheet for the year 2007 showing various elements of cost per unit
- ii. Estimated cost sheet & profit for 2008 assuming that 15,000 will be produced and sold during the year 2008 and factory overheads will be recovered as a % of direct wages and office & selling overheads as a percentage of works cost.

Sol: Cost sheet of E ltd. Company for the year 2007 (10,000 units)

Particulars	Unit rate	O.C
Materials (90000/10,000)	9.00	90,000
Direct wages	6.00	60,000
PRIME COST	15.00	1,50,000
<u>Add:</u> factory Overheads power & consumable stores	1.2	12,000
indirect wages	1.5	15,000
factory lighting	0.55	5,500
cost of defective work plant & depreciation	0.3	3,000
	1.15	11,500
	19.7	1,97,000
<u>Less:</u> sale of scrap	0.2	2,000
FACTORY/ WORKS COST	19.5	1,95,000
<u>Add:</u> office overheads clerical staff salaries	3.35	33,500
OFFICE COST	22.85	2,28,500
<u>Add:</u> Selling & distribution overheads	0.55	55,000
TOTAL COST	23.4	2,34,000
profit	8.2	82,000
SALES	31.6	3,16,000

- i. Calculation of factory overheads rates on direct wages

$$\frac{\text{factory O.H}}{\text{direct wages}} \times 100 = \frac{45,000}{60,000} \times 100 = 75\%$$

- ii. Calculation of office & selling O.H on works cost

$$\frac{\text{office O.H}}{\text{works cost}} \times 100 = \frac{5,500+33,500}{1,95,000} \times 100 = 20\%$$

Tender sheet for 15,000 units

Particulars	Unit rate	O.C
Materials	9.90	1,48,500
Direct wages	6.60	99,000
PRIME COST	16.50	2,47,500
<u>Add:</u> factory Overheads 75% of direct wages	4.95	74,250
FACTORY/ WORKS COST	21.45	3,21,750
<u>Add:</u> office and selling & distribution overheads 20% of works cost	4.29	64,350
TOTAL COST	25.74	3,86,100
profit	5.26	78,900
SALES	31.00	4,65,000

PROBLEMS ON PROCESS COSTING

MODEL 1: When Abnormal and normal wastages are not given in the problem

Q1. Prepare process accounts and calculate total cost of production from the following

Particulars	Process		
	X	Y	Z
Materials	2,250	750	300
Labour	1,200	3,000	900
<u>DIRECT EXPENSES</u>			
Fuel & Power	300	200	400
Carriage	200	300	100
Work Overheads	1,890	2,580	1,875

Indirect expenses of Rs. 1,275 should be apportioned on the basis of Direct wages

Sol: Calculation of Indirect Wages to X,Y,Z in the ratio of Direct Labour (4:10:3):

X process share indirect wages : $1275 \times (4 \div 17) = 300$

Y process share indirect wages : $1275 \times (10 \div 17) = 750$

Z process share indirect wages : $1275 \times (3 \div 17) = 225$

Dr

Process X Account

Cr

Particulars	Amount	Particulars	Amount
To materials	2,250	By transfer to process Y	6,140
To labour	1,200		
To fuel & power	300		
To carriage	200		
To work overheads	1,890		
To indirect expenses	300		
	6,140		6,140

Dr

Process Y Account

Cr

Particulars	Amount	Particulars	Amount
To transfer from process X	6,140	By transfer to process Z	13,720
To materials	750		
To labour	3,000		
To fuel & power	200		
To carriage	300		
To work overheads	2,580		
To indirect expenses	750		
	13,720		13,720

Dr

Process Z Account

Cr

Particulars	Amount	Particulars	Amount
To transfer from process Y	13,720	By stock of finished good (BIF)	17,520
To materials	300		
To labour	900		
To fuel & power	400		
To carriage	100		
To work overheads	1,875		
To indirect expenses	225		
	17,520		17,520

MODEL 2: When normal loss is given in problem

Q2. Prepare process accounts A & B from following information

Particulars	Process	
	A	B
Materials (50 units)	50	--
Expenses	30	--

Normal Loss	5 units valued at Rs. 1.25	2 units valued at Rs. 3.50
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Sol:

Dr **Process A account** Cr

Particulars	Units	Amount	Particulars	Units	Amount
To materials	50	50	By normal loss (5x1.25)	5	1.25
To expenses	--	30	By transfer to process B a/c	45	78.75
	50	80		50	80

Dr **Process B account** Cr

Particulars	Units	Amount	Particulars	Units	Amount
To transfer from process A	45	79	By normal loss	2	3.5
			By finished goods	43	75.25
	45	79		45	78.75

MODEL 3: When Normal and Abnormal wastages/losses are given

Q3. A product passes 3 process A, B & C. The normal wastage of each process is as follows:

Process	Normal loss	Wastage sold
A	3%	25 paise per unit
B	5%	50 paise p.u
C	8%	1 rupee p.u

10,000 units were issues to process A on 1-Apr-2004 at a cost of Rs.1 per unit. The other costs were given as follows

	A	B	C
Sundry material	1,000	1,500	500
Labour	5,000	8,000	6,500
Direct expenses	1,050	1,188	2,009
Actual output (in units)	9,500	9,100	8,100

Prepare process accounts assuming that no opening and closing stocks, also prepare abnormal wastage gain account.

Sol:

Dr Process A a/c Cr

Particulars	Units	Amount	Particulars	Units	Amount
To units introduced	10,000	10,000	By normal loss @ 3% of output	300	75
To material	--	1,000	By abnormal loss	200	350
To labour cost	--	5,000	By transfer to process B a/c	9,500	16,625
To direct expenses	--	1,050			
	10,000	17,050		10,000	17,050

Working Notes: Calculation of the value of abnormal wastage of 200 units in process A

$\frac{\text{Dr Value} - \text{Cr Value}}{\text{Dr units} - \text{Cr units}} \times \text{abnormal wastage}$

$$\frac{17,050 - 75}{10,000 - 300} \times 200 = 350/-$$

Dr Process B a/c Cr

Particulars	Units	Amount	Particulars	Units	Amount
To transfer from process A a/c	9,500	16,625	By normal loss @ 5% of output	475	238
To material	--	1,500	By abnormal loss	-	-
To labour cost	--	3,000	By transfer to process C a/c	9,100	27,300
To direct expenses	--	1,188			
To abnormal gain	75	225			
	9,575	27,538		9,575	27,538

Working Notes: Calculation of the value of abnormal gain of 75 units in process B

$\frac{\text{Dr Value} - \text{Cr Value}}{\text{Dr units} - \text{Cr units}} \times \text{abnormal wastage}$

$$\frac{27,313-238}{9,500 - 475} \times 75 = 225/-$$

Dr Process C a/c Cr

Particulars	Units	Amount	Particulars	Units	Amount
To transfer from process B a/c	9,100	27,300	By normal loss @ 8% of output	728	728
To material	--	500	By abnormal loss	272	1,156
To labour cost	--	6,500	By transfer to finished goods	8,100	34,425
To direct expenses	--	2,009			
	9,100	36,309		9,100	36,309

Working Notes: Calculation of the value of abnormal loss of 272 units in process C

$\frac{\text{Dr Value} - \text{Cr Value}}{\text{Dr units} - \text{Cr units}} \times \text{abnormal wastage}$

$$\frac{36,309-728}{9,100-728} \times 272 = 1,156/-$$

Dr Abnormal loss a/c Cr

Particulars	Units	Amount	Particulars	Units	Amount
To process A a/c	200	350	By sale of wastage process A	200	50
To process C a/c	272	1,156	Process C	272	272
			By profit&loss a/c	-	1,184
	472	1,506		472	1,506

Dr

Abnormal wastage a/c

Cr

Particulars	Units	Amount	Particulars	Units	Amount
To sale value in process B	75	38	By process B a/c	75	225
To P&L a/c	-	187			
	75	225		75	225

Applications [Merits] of Marginal Costing

Marginal costing is a very useful technique of costing and has great potential for management in various managerial tasks and decision-making process. The applications of marginal costing are discussed in the following paragraphs:

1) **Cost Control:** One of the important challenges in front of the management is the control of cost. In the modern competitive environment, increase in the selling price for improving the profit margin can be dangerous as it may lead to loss of market share. The other way to improve the profit is cost reduction and cost control. Cost control aims at not allowing the cost to rise beyond the present level. Marginal costing technique helps in this task by segregating the costs between variable and fixed. While fixed costs remain unchanged irrespective of the production volume, variable costs vary according to the production volume. Certain items of fixed costs are not controllable at the middle management or lower management level. In such situation it will be more advisable to focus on the variable costs for cost control purpose. Since the segregation of costs between fixed and variable is done in the marginal costing, concentration can be made on variable costs rather than fixed cost and in this way unnecessary efforts to control fixed costs can be avoided.

2) **Profit Planning:** Another important application of marginal costing is the area of profit planning. Profit planning, generally known as budget or plan of operation may be defined as the planning of future operations to attain a defined profit goal. The marginal costing technique helps to generate data required for profit planning and decision-making. For example, computation of profit if there is a change in the product mix, impact on profit if there is a change in the selling price, change in profit if one of the product is discontinued or if there is a introduction of new product, decision regarding the change in the sales mix are some of the areas of profit planning in which necessary information can be generated by marginal costing for decision making. The segregation of costs between fixed and variable is thus extremely useful in profit planning.

$$\text{Desired sales} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V Ratio}}$$

3), **Key Factor Analysis:** The management has to prepare a plan after taking into consideration the constraints if any, on the various resources. These constraints are also known as limiting factors or principal budget factors as discussed in the topic of 'Budgets and Budgetary Control'. These key factors may be availability of raw material, availability of skilled labour, machine hours availability, or the market demand of the product. Marginal costing helps the management to decide the best production plan by using the scarce resources in the most beneficial manner and thus optimize the profits. For example, if raw material is the key factor and its availability is limited to a particular quantity and the company is manufacturing three products, A, B and C. In such cases marginal costing technique helps to prepare a statement, which shows the amount of contribution per kg of material. The product, which yields highest contribution per kg of raw material, is given the priority and produced to the maximum possible extent. Then the other products are taken up in the order of priority. Thus the resultant product mix will yield highest amount of profit in the given situation.

4. Decision Making: Managerial decision-making is a very crucial function in any organization. Decision – making should be on the basis of the relevant information. Through the marginal costing technique, information about the cost behaviour is made available in the form of fixed and variable costs. The segregation of costs between fixed and variable helps the management in predicting the cost behaviour in various alternatives. Thus it becomes easy to take decisions. Some of the decisions are to be taken on the basis of comparative cost analysis while in some decisions the resulting income is the deciding factor. Marginal costing helps in generating both the types of information and thus the decision making becomes rational and based on facts rather than based on intuition. Some of the crucial areas of decision-making are mentioned below.

- _ Make or buy decisions
- _ Accepting or rejecting an export offer
- _ Variation in selling price
- _ Variation in product mix
- _ Variation in sales mix
- _ Key factor analysis
- _ Evaluation of different alternatives regarding profit improvement
- _ Closing down/continuation of a division
- _ Capital expenditure decisions.

5. Break Even Point

The concept of 'Break Even Point' is extremely important for decision making in various areas. This concept is based on the behaviour of costs, i.e. fixed cost and variable costs. As discussed earlier, fixed costs are those costs that remain constant irrespective of the changes in the volume of production. On the other hand, variable costs are the costs that vary with the level of production. While fixed cost per unit is always variable, variable cost per units is always fixed. In addition to these two types of costs, there are semi variable costs that are partially fixed and partially variable. Semi variable costs thus have the features of both types of costs. They remain fixed up to a certain level of production and after crossing that level,

they become variable. The Break Even Point is a level of production where the total costs are equal to the total revenue, i.e. sales. Thus at the breakeven level, there is neither profit nor loss. Production level below the break-even-point will result into loss while production above break-even point will result in profits.

6. Closing down a plant / Shutdown Decision

A factory may have to cease operation for sometime due to various reasons such as labour troubles, material shortage, major break down, market depression etc., this shut down may be of temporary nature and operations are renewed when the situation improves. Shut down costs are classified as follows:

1. Costs incurred on suspension of operations. These include cost of notifying customers about shut down, retrenchment and lay off costs etc.
2. Costs incurred during continued shut down such as cost of care and custody of plant and machinery and other equipment etc.
3. Costs incurred on remaining operations after shut down e.g., cost of recruiting and training new workers time lag in packing up production and sales, additional promotional costs etc.

7. Dropping a product line/ Discontinuance of a product Line:

Another type of decision making in multi-product firm is regarding the dropping of a product line. The following factors should be considered before taking a decision about the dropping of a product line.

1. The contribution given by the product, this contribution is the difference from profit. Profit is arrived at after deducting fixed cost from contribution. Fixed costs are apportioned over different products on some reasonable basis which may not be very much correct. Hence contribution gives a better idea about the profitability of a product as compared to profit.
2. The capacity utilization i.e., whether the firm is working with full capacity or below normal capacity. In case a firm is having idle capacity, the production of any product which can contribute toward the recovery of fixed cost can be justified.
3. The availability of product to replace the product which the firm wants to discontinue and which is already accounting for a significant proportion of the total capacity.
4. The long-term prospects the market for the product.
5. The effect on sale of other products. In some cases, dropping down of one product may result in heavy decline in sales of other products affecting the overall profitability of the firm.

8. Charging General and Specific Fixed Costs:

Sometimes it is observed that general fixed cost is apportioned to departments or for products. This may be done for ascertainment of total cost but will not be prudent for decision making. Any apportionment of general fixed costs may give misleading

results. However, where fixed costs are specific. The same may be taken into consideration as a relevant cost.

9. Fixation of Selling Price:

Although the prices are more controlled by market conditions and other economic factors than by decisions of management yet fixation of selling prices is one of the most important functions of management. This function is to be performed

- Under normal conditions
- In times of competition
- In times of trade depression.
- In accepting additional orders for utilising idle capacity.
- In exporting and exploring new markets.
- Selling price below the Marginal cost.
- When a new product is introduced into the market.
- When foreign market is to be explored to earn foreign exchange.
- When the concern has already purchased large quantities of material.
- At the time of closure of the business.
- When the sales one product at a price below the marginal cost will be pushed up the sales of other profitable products.
- When employees cannot be retrenched.
- When the goods are perishable in nature.

UNIT-III

MAKE OR BUY DECISIONS

MARGINAL COSTING

INTRODUCTION OF MARGINAL COSTING:

Marginal Costing is not a method of costing like job, batch or contract costing. It is in fact a technique of costing in which only variable manufacturing costs are considered while determining the cost of goods sold and also for valuation of inventories. In fact this technique is based on the fundamental principle that the total costs can be divided into fixed and variable. While the total fixed costs remain constant at all levels of production, the variable costs go on changing with the production level. It will increase if the production increases and will decrease if the production decreases. The technique of marginal costing helps in supplying the relevant information to the management to enable them to take decisions in several areas. In this chapter, the technique of marginal costing is explained in detail.

DEFINITIONS OF MARGINAL COSTING:

Marginal Cost is defined as, 'the change in aggregate costs due to change in the volume of production by one unit'. For example, if the total number of units produced are 800 and the total cost of production is Rs.12, 000, if one unit is additionally produced the total cost of production may become Rs.12, 010 and if the production quantity is decreased by one unit, the total cost may come down to Rs.11, 990. Thus the change in the total cost is by Rs.10 and hence the marginal cost is Rs.10. The increase or decrease in the total cost is by the same amount because the variable cost always remains constant on per unit basis. Marginal Costing has been defined as, 'Ascertainment of cost and measuring the impact on profits of the change in the volume of output or type of output. This is subject to one assumption and that is the fixed cost will remain unchanged irrespective of the change.' Thus the marginal costing involves firstly the ascertainment of the marginal cost and measuring the impact on profit of alterations made in the production volume and type. To clarify the point, let us take a simple example, suppose company X is manufacturing three products, A, B and C at present and the number of units produced are 45 000, 50 000 and 30 000 respectively p.a. If it decides to change the product mix and decides that the production of B is to be reduced by 5000 units and that of A should be increased by 5000 units, there will be impact on profits and it will be essential to measure the same before the final decision is taken. Marginal costing helps to prepare comparative statement and thus facilitates the decision-making. This decision is regarding the change in the volume of output. Now suppose if the company has to take a decision that product B should not be produced at all and the capacity, which will be

available, should be utilized for A and B this will be change in the type of output and again the impact on profit will have to be measured. This can be done with the help of marginal costing by preparing comparative statement showing profits before the decision and after the decision. This is subject to one assumption and that is the fixed cost remains constant irrespective of the changes in the production. Thus marginal costing is a very useful technique of costing for decision-making.

PROBLEM ON MARGINAL COSTING:

Company X is producing 1 00 000 units. The variable cost per unit is Rs.5 and the fixed costs are Rs.5, 00,000. If we work out the total cost per unit, it will be variable cost + fixed cost per unit [at present level of production] that means, the total cost will be $Rs.5 + Rs.5 = Rs.10$. But as per the technique of marginal costing, the variable cost only i.e. Rs.5, will be charged to the production while the fixed cost of Rs.5, 00, 000 will not be charged to the cost of production, it will be charged to the Costing Profit and Loss Account. Thus the selling price of the product will be fixed on the basis of variable costs of Rs.5 per unit. This may result in charging the price below the total cost but producing and selling a large volume of the product will cover the fixed costs. Suppose, in the above example, selling price is Rs.9, which covers the variable cost but not the total cost, efforts of the company will be to maximize the volume of sales and through the margin between the selling price and variable cost, cover the fixed cost. The difference between the selling price of Rs.10 per unit and the variable cost of Rs.5 per units is the margin, which is called as 'Contribution'. The contribution margin in this case is Rs.5 per unit. If the company is able to produce and sell, say, 1 50 000 units it will earn a total contribution of $Rs.5 \times 1\ 50\ 000\ units = Rs.7\ 50\ 000$ which will cover the fixed costs and earn profits. However if the company is not able to sell sufficient number of units, it will incur a loss. The concept of break-even point which is discussed in detail later in this chapter is based on the same calculation.

Determination of marginal costing is the first basic principle of marginal costing. Marginal cost is the additional cost of the production of additional unit. The marginal cost to an economist means the cost of producing one additional unit of output and in this cost fixed costs may be included. In cost accounting and management accounting marginal cost means only variable expenses and it excludes the fixed cost. Hence it can be said that marginal cost means additional variable cost to produce one more unit.

FEATURES OF MARGINAL COSTING:

1. Marginal costing is a technique of costing which is used in conjunction with other methods of costing like process or job costing.
2. Only marginal costs i.e., variable costs are charged to products. These include direct material, direct labour, direct expenses and variable over heads.
3. Fixed costs are treated as period costs and are directly charged to profit and loss account for the period for which they are incurred. They are not charged to products.
4. The finished goods and work-in-progress are valued at marginal cost.

5. In marginal costing prices are determined on the basis of marginal cost plus contribution.
6. Profitability of departments and products is determined with reference to their contribution margin.
7. Fixed costs remain constant irrespective of level of activity.
8. Cost-volume-profit relationship is fully employed to reveal the state of profitability at various levels of activity.
9. It high lights the effect of costs on the level of output planned.
10. Break-even point is the prime component of marginal costing technique.

ADVANTAGES OF MARGINAL COSTING:

i) Simply to operate and easy to understand:

Marginal costing is a simple technique. It is very simple to operate and easy to understand. It is constant in nature. Complications involved in allocation, apportionment and absorption of overheads are avoided.

ii) Cost control:

In marginal costs are divided into fixed and variable costs. Variable costs are always controllable. Thus greater control may be exercised over these costs. Further, effective control on fixed costs becomes easier by treating them as a whole in the determination of profit.

iii) Helps Management in Decision making:

This technique helps the management in taking various decisions. Marginal costing is more useful in taking decisions like price fixation, make or buy, introduction of new product line, selection of product mix etc.

iv) Relationship of net income with sales:

Marginal costing system establishes direct relationship of net income with the sales. The marginal contribution technique provides a better and more logical basis for the fixation of sales prices with intending profits.

v) Treatment of Overheads simplified:

It reduces the degree of over or under recovery of overheads due to separation of fixed overheads from production cost.

vi) Helps in preparing Flexible Budget:

Marginal costing facilitates the preparation of flexible budget by differentiating variable costs and fixed costs. It also helps in the evaluation of performance of responsible personnel.

vii) Stock Valuation:

Marginal costing inventory is valued at variable cost. Thus, unrealized profits are not taken into account. Under this method stock valuation will be uniform and realistic.

viii) Aid to profit planning:

Marginal costing technique provides data relating to cost-volume-profit relationship. This facilitates profit planning in future.

xi) Helps in pricing:

Marginal costing is very helpful in fixation of selling price of products under various conditions. It gives a better and more logical base for the fixation of sales price as well as for tendering contracts when the business is at low level.

x) Profitability Appraisal:

Marginal costing helps the management in evaluating the profitability of alternative operations.

LIMITATIONS OF MARGINAL COSTING:

i) Practical Difficulty In Dividing Cost:

The whole concept of marginal costing is based on the classification of total cost into fixed and variable cost which is a very difficult task. In marginal costing semi-variable and semi-fixed costs are not considered.

ii) Time Factor Ignored:

Marginal costing technique does not attach much importance to time factor. If time taken for completing two different jobs is not the same, costs will naturally be higher for the job which has taken longer time. Though marginal cost may be the same for both jobs.

iii) Improper basis of pricing:

Marginal costing gives an impression that as long as the price is more than the marginal cost of production is profitable. But it may result in overall losses. In the long run the price without covering total cost will not yield profit to the firm.

iv) Not suitable to all industries:

Marginal costing technique is not suitable to all types of industries. For example, in capital intensive industries fixed cost like depreciation is more. If fixed costs are ignored, proper results cannot be ascertained. With the increase of automation, the scope of marginal costing is decreasing.

v) Fluctuations in Profits:

Marginal costing technique cannot be applied in industries where there is large stock of work-in-progress. As fixed overheads are not included in the value of stock, firm will get losses in some years. This results in wide fluctuations in profits.

vi) Difficulty in fixation of price:

Under marginal costing, selling price is fixed on the basis of contribution. In case of cost plus contract is very difficult to fix price.

vii) Under or over absorption:

application of variable overheads depends on estimate and not on actual as such there may be under or absorption.

viii) Full claim cannot be claimed:

Since stock is valued at marginal cost, in case of fire full amount of loss cannot be recovered from the insurance company.

xi) Not suitable for external reporting:

This technique is not suitable for external reporting viz., for tax authorities, where marginal income is not considered to be taxable profit.

X) Significance Lost:

In capital intensive industries fixed costs occupy major portion in the total cost. But marginal costs cover only variable costs. As such, it loses its significance in capital intensive industries.

x) Full information is not given:

Marginal costing does not explain reasons for increase in production or sales.

1. MAKE OR BUY DECISION

A firm may make some products; parts or tools or sometimes it may buy the same thing from outside. The management must decide which is profitable. In taking such a make or buy decision marginal costing technique helps the management.

Make or buy decisions become necessary when utilized production facilities exist and the product being produced has a component, which can either be made in the factory itself or purchased from outside market.

While deciding to make or buy, the cost comparison should be made between the marginal cost of manufacture and price at which the product or component could be obtained from outside. It is profitable to the firm to buy the component from others only when the supplier's price is less than the marginal cost. Fixed costs are excluded on the assumption that they have been already recovered.

Factors that influence make or Buy Decision:

In a make or buy decision, the following cost and non-cost factors must be considered specifically

Cost Factors

- a) Availability of plant facility.
- b) Quality and type of item which effects the production schedule.
- c) The space required for production of item.
- d) Any special machinery or equipment required.
- e) Any transportation involved due to the location of the product i.e., the feeder point.
- f) Cost of acquiring special know-how required for the item.

2. KEY FACTOR OR LIMITING FACTOR

The limiting factor which prevents an enterprise from earning unlimited profit is known as the key factor. Usually this limiting factor is sales. A concern may not be able to sell as much as it can produce. Sometimes a concern cancels all it produces but production is limited due to the shortage of material, lower plant capacity or capital. In such a case, decision has to be taken the choice of the product whose production is to be increased, reduced or stopped. The key factor is also called as limiting factor or principle budget factor.

When there is no limiting factor, the choice of the product will be on the basis of the highest P/V Ratio. But when there is scarce or limited resources selection of the product will be on the basis of contribution per unit of scarce factor of production. When a limiting factor is in operation, the contribution per unit of such a factor should be the criterion to judge the profitability of a product. When two or more limiting factors are in operation simultaneously, it is necessary to take all of them into consideration to determine the profitability. When the material is in short supply, profitability is determined by contribution per kg, when labour shortage is there profitability is measured contribution per labour hour.

3. SELECTION OF A SUITABLE PRODUCT MIX

When a factory manufactures more than one product, a problem is faced by the management as to which product mix gives the maximum profits. The best product mix is that which yields the maximum contribution.

- The best product mix is that which yields the maximum contribution.
- The products which give the maximum contribution are to be retained and their production should be increased.
- The products which give comparatively less contribution should be reduced or close down altogether.
- The effect of sales mix can also be seen by comparing the P/V Ratio and Breakeven point.

- The new sales mix will be favourable if it increases P/V Ratio and reduces the breakeven point.

4. DIVERSIFICATION OF PRODUCTS

Sometimes it becomes necessary for a concern to introduce a new product or products in order to utilize the idle capacity or to capture a new market or for other purposes. General fixed costs will however, be charged to the old product / products.

- In order to decide about the profitability of the new product, it is assumed that the manufacture of the new product will not increase fixed costs of the concern.
- If the price realized from the sale of such product is more than its variable cost of production it is worth trying.
- If the data is presented under absorption costing method, the decision will be wrong.
- If with the introduction of new product, there is an increase in the fixed costs, then such specific increase in fixed costs must be deducted from the contribution for making any decision.
- General fixed costs will be charged to the old products.

5. CLOSING DOWN ALL SUSPECTING ACTIVITIES

The deduction to close down or suspend its activities will depend whether products are making contribution towards fixed costs or not. i.e., whether the contribution is more than the difference in fixed costs by working at normal operations and when the plant or product is closed down or suspended.

If the business is closed down,

- They may be certain fixed costs which could be avoided.
- There will be certain expenses which will have to be incurred at the time of closing the operations like redundancy payments, necessary maintenance of the plant or overhauling of plant on reopening training of personal etc.
- Such costs are associated with closing down of the business and must be taken into consideration before taking any decision.

Applications of BEP for various business problems:

1. MAKE OR BUY DECISION

A firm may make some products; parts or tools or sometimes it may buy the same thing from outside. The management must decide which is profitable. In taking such a make or buy decision marginal costing technique helps the management.

Make or buy decisions become necessary when utilized production facilities exist and the product being produced has a component, which can either be made in the factory itself or purchased from outside market.

While deciding to make or buy, the cost comparison should be made between the marginal cost of manufacture and price at which the product or component could be obtained from outside. It is profitable to the firm to buy the component from others only when the supplier's price is less than the marginal cost. Fixed costs are excluded on the assumption that they have been already recovered.

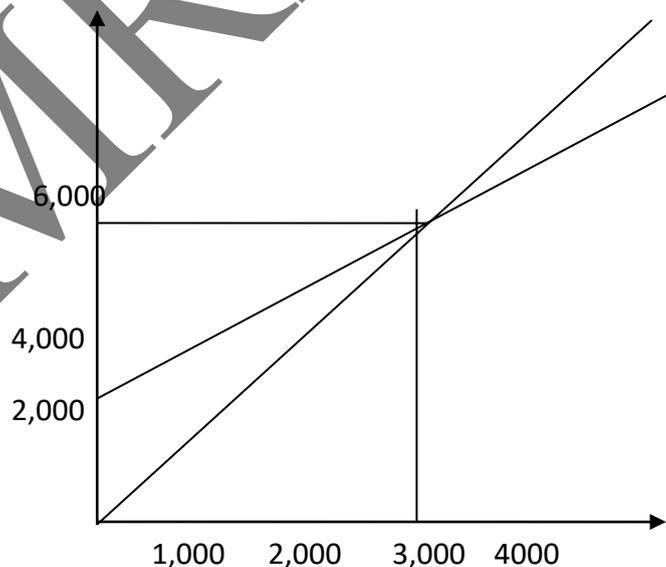
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In a make or buy decision, the following cost and non-cost factors must be considered specifically

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3. The space required for production of item.
4. Any special machinery or equipment required.
5. Any transportation involved due to the location of the product i.e., the feeder point.
6. Cost of acquiring special know-how required for the item.

Every business process need planning to select, plan, analyse and reengineering and it is essence of operating management. One of the common used quantitative method is process selection is break –even analysis. This helps in identifying what volume of sales and production can make it profit. Process planning involve major issues such as make or buy decision. This make or buy decision refer to a decision such as which components are purchased and which components are manufactured . management is usually confronted with the problem of decision of make or buy of any item. This problem can be solve by a large extent through break-even chart.



2. PRICING DECISION:

Break-even point is valuable analytical tool to recognize and interpret its results. For management it is useful in pricing determination, expenses control and profitability. Changing the price of a product would change the total revenue function of the business and this would affect the break-even point and the margin of safety. These factors need to be considered along with market-based factors such as the demand for the product.

3. SALES MIXING DECISION:

Altering the sales mix in a multi-product environment would tend to alter the total revenue function of the business and also the variable cost function. This would affect the break-even point and margin of safety but by explaining the effects of different sales mixes it is possible to consider their effect on the profitability of the business and this will facilitate decisions regarding the sales mix.

4. PRODUCTION CAPACITY PLANNING:

We have seen that the cost and revenue relationship do not apply indefinitely but only within the relevant range. As activity is expanded it will eventually be constrained by shortage of one of the factors of production and this factor is known as the limiting factor. While this limitation can be overcome in the long term. In short term maximum profits can be made by maximising contribution per unit of the limiting factor.

The limiting factor is the major constraint on organizational activity. Here we will merely state that C.V.P. Analysis can facilitate an understanding of the effect upon profit of the limiting factor.

BREAK EVEN ANALYSIS

When we use in broad sense, break-even analysis is used to determine probable profit /loss at any given level of production or sales. It also helps to determine the amount or volume of sales to earn a desired amount of profit.

Break Even Analysis refers to analysis of the break-even point(BEP).

The BEP is defined as no profit or no loss point. Why is it necessary to determine the BEP when there is neither profit nor loss? It is an important because it denotes the minimum volume of production to be undertaken to avoid losses. In other words, it points out how much minimum to be produced to see the profits. It is a technique for profit planning and control and therefore is considered a valuable managerial tool.

Break-even analysis is defined as analysis of costs and their possible impact on revenues and volume of the firm. Hence, it is also called the cost-volume-profit analysis. A firm is said to

attain the BEP when its total revenue is equal to total cost ($TR=TC$). Total cost comprises fixed cost and variable cost. The significant variables on which the BEP is based are fixed cost, variable cost and total revenue. The study of cost-volume-profit relationship is often referred as Break Even Analysis. The Break Even Analysis is interpreted in two senses. In its narrow sense, it is concerned with finding out Break Even Point. Break Even Point is the point at which total revenue is equal to total cost. It is the point of no profit , no loss. In its broad sense, BEP determines the probable profit at any level of production.

ASSUMPTIONS OF BREAK EVEN ANALYSIS:

1. Costs can perfectly be classified into fixed and variable costs.
2. Selling price per unit remains constant in spite of competition or change in the volume of production. It does not consider the price discounts or cash discounts.
3. Volume of sales and volume of production are equal(All the goods produced are sold). Hence there is no closing stock/ unsold stock.
4. There is only one product available for sale. In case of multi product firm, the product mix / Sales mix remains constant.
5. Fixed costs remain constant at all levels of output.
6. Variable cost fluctuates /varies proportionally with volume of production.
7. There is no opening or closing stock.
8. There will be no change in operating efficiency.
9. The volume of output or production is the only factor which affecting/influencing the cost.
10. There will be no change in general price level.

SIGNIFICANCE / IMPORTANCE/ADVANTAGES OF BREAK-EVEN ANALYSIS

1. Information provided by Break-Even Chart can be understood more easily than those contained in profit and Loss Account and the cost statement.
 2. Break Even Chart discloses the relationship between cost, volume and profit. It reveals how changes in the profit. So it helps management in decision-making.
 3. It is very useful for forecasting costs and profits for a long-term planning and growth.
 4. The Break Even Chart discloses profits at various levels of production.
- It serves as very useful tool for cost control.
6. It can also be used to study the comparative plant efficiencies of the industry.

7. Analytical Break Even Chart presents the different elements in the costs i.e., direct material, direct labour, fixed overheads and variable overheads.

Break-even analysis is also a valuable tool

- to ascertain the profit on a particular level of sales volume or a given capacity of production.
- to calculate sales required to earn a particular desired level of profit.
- to compare the product lines, sales area, methods of sale for individual company.
- to compare the efficiency of the different firms.
- to decide whether to add a particular product to the existing product line or drop one from it.
- to decide to 'make or buy' a given component or spare part.
- to decide what promotion mix will yield optimum sales.
- to assess the impact of changes in fixed cost, variable cost or selling price on BEP and profits during a given period.

LIMITATIONS OF BREAK-EVEN ANALYSIS

Break-even analysis has certain underlying assumptions which form its limitations.

1. Break-even point is based on fixed cost, variable cost and total revenue. A change in one variable is going to affect the BEP.
2. All costs cannot be classified into fixed and variable costs. We have semi-variable costs also.
3. In case of multi-product firm, a single chart cannot be of any use. Series of charts have to be made use of.
4. It is based on fixed cost concept and hence holds good only in the short-run.
5. total cost and total revenue lines are not always straight as shown in the figure. The quantity and price discounts are the usual phenomena affecting the total revenue line.
6. Where the business conditions are volatile/ unstable BEP cannot give stable results.
7. Break-even chart represents only cost volume profits. It ignores other considerations such as capital amount, marketing aspects and effect of government policy etc., which are necessary in decision making.
8. It is assumed that sales, total cost and fixed cost can be represented as straight lines. In actual practice, this may not be so.

9. It assumes that profit is a function of output. This is not always true. The firm may increase the profit without increasing output.
10. A major drawback of Break Even Chart(BEC) is its inability to handle production and sale of multiple products.
11. It is difficult to handle selling costs such as advertisement and sales promotion in BEC.
12. It ignores economies of scale in production.
13. Fixed costs do not remain constant in the long run.
14. Semi-variable costs are completely ignored.
15. It assumes production is equal to sale. It is not always true because generally there may be opening stock.
16. When production increases variable cost per unit may not remain constant but may reduce on account of bulk buying etc.
17. The assumption of static nature of business and economic activities is a well-known defect of Break Even Chart (BEC).

INTER-FIRM COMPARISONS

Meaning of Inter-firm comparison:

Inter-Firm comparison is a technique, which studies the performances, efficiencies, costs and profits of various concerns in an industry with help of exchange of information in order to have a relative comparison. It involves the process by bringing together a number of identical firms and collecting their business figures and statistics through a neutral organization in which the participating firms repose their full confidence.

The figures under comparison may relate to:

1. Financial results viz., the position of assets, liabilities, profit, capital employed etc., expressed in terms of financial ratios.
2. Cost structure of the products viz., material cost, labour cost and overhead cost etc., expressed in terms of cost ratios.
3. Physical and operational performance such as output or operation per man-hour, expressed in terms of productivity ratios, percentages and so on.

Need for Inter-firm comparison:

Progressive management, the world over has always asked itself the question how is my company performing in comparison to that of others? The published trading and profit and loss accounts and balance sheets along with annual reports provide scanty data for purposeful study and assessment of the performance of a company.

The figures from these reports just indicate in a general way, the profitability, stability, solvency and growth of an organization, but they do not throw light on whether a company has really made the optimum use of all the available resources in men, materials etc. It is the inter-firm comparison that provides the management with a vivid comparative picture of how its operating performance, financial results and product cost structure compare with those of other firms of similar size, nature, industry or trade.

Requirement (prerequisites) of Inter-firm comparison Scheme:

The following are the main requirements while installing a scheme of inter-firm comparisons:

1. Adoption of uniform costing:

There must be a sound system of uniform costing in the firm where inter-firm comparison scheme is to be implemented. A uniform manual should also be prepared and distributed among the member units to enable the function of the system efficiently.

2. Organization Responsible:

An organization must be established to run the system efficiently and for better results firms of different sizes in an industry should become member of the organization.

3. Information to be collected:

The nature of information to be collected from the participating firms depends upon the needs of the management, comparative importance of the information and the efficiency of the central body responsible for the collection of the information.

4. Method of Collection and Presentation of Information:

The time and the firm in which the information is to be submitted by the member units must be decided in advance. The various statistical tools for the purpose of collection of data, its editing, classification, presentation, drawing conclusions and inferences can be used. Ratio analysis for measuring profitability, efficiency and productivity can also be used.

Types of comparisons:

The following three types of comparisons made for this purpose.

1. Comparison of Management Ratio:

The management ratios are those which are linked to sales, profits, and assets of the business. These ratios are not meant to provide management in a nutshell with comparative picture of its operating performance.

2. Comparison of Cost Ratios:

Management may not be satisfied with the ratios calculated in. they would like to go a step further to make inter-firm comparison more meaningful and to find out how they are doing in relation to others as regards the cost of production.

3. Comparison of Technical Data:

This type of comparison will be of special interest to industries working in highly competitive economics. It is visualized that technical comparison will be in the realm of quality of materials used, their utilization, process involved machinery used and certain other technical aspects of production. The following are the main ratios, which are calculated for this purpose:

1. $\frac{\text{Quality of Raw Material consumed}}{\text{Man Hours or Machine Hours}}$
2. $\frac{\text{Cost of Raw Material consumed}}{\text{Man Hours or Machine Hours}}$
3. $\frac{\text{Cost of Scrap}}{\text{Cost of Raw Material Consumed}}$
4. $\frac{\text{Quality of Scrap}}{\text{Cost of Raw Material Consumed}}$
5. $\frac{\text{Quality of Scrap}}{\text{Quality of Raw Material Consumed}}$
6. $\frac{\text{Quantity produced}}{\text{Man Hours or Machine Hours}}$
7. $\frac{\text{Cost of Rejected material}}{\text{Cost of production}}$
8. $\frac{\text{Cost of reworking}}{\text{Cost of production}}$
9. $\frac{\text{Loss of Process}}{\text{Cost of Material}}$
10. $\frac{\text{Idle time hours}}{\text{Total Available time}}$
11. $\frac{\text{Overtime Hours}}{\text{Man Hours}}$
12. $\frac{\text{Cost of Idle Time}}{\text{Direct Labour Cost}}$
13. $\frac{\text{Power Units Consumed}}{\text{Machine Hours}}$

14. Total cost of production
Man Hours or Machine Hours
15. Quality of Scrap
Cost of Raw Material Consumed
16. Cost of Machine Maintenance
Cost of Production
17. Cost of maintenance of other factory assets
Cost of Production

Advantages of Inter- Firm Comparisons:

Inter-firm comparison is nothing more than learning. It is for the management that inter-firm comparison has been evolved as a Inter-firm comparison:

1. It encourages managerial efficiency in the organization by technique in industry. The following are the main advantages of pointing out the spots of inefficiencies and thus brings stability in the cost structure and presentation of information.
2. It creates cost consciousness among the participating firms and they are cautious in this respect at all levels of management.
3. It helps the member firms to reduce their costs in case their costs are more as compared to other firms.
4. It increases the productivity by locating the weaknesses and in economies.
5. It provides useful information to management of every member unit to make proper decisions.
6. It helps the government, regulatory agencies and researchers in getting useful data and information to improve policies and conducting depth studies and research.

IMPORTANT PROBLEMS FROM BREAK EVEN ANALYSIS

1. You are required to compute (i) Break Even Point (Rs.) (ii) Margin of Safety (MOS) (iii) Margin of Safety Ratio (iv) Sales at a Profit of Rs.10,000 from the following information:

Sales Rs. 3,00,000 ; Variable Cost Rs.2,00,000 ; Fixed Cost Rs. 70,000;

Profit Rs. 30,000.

Solution: Break-Even Point (Rs.) = Fixed cost / P/V Ratio

P/V Ratio = (Contribution / Sales) X 100

Contribution= Sales – Variable cost

$$= 3,00,000 - 2,00,000 = \text{Rs. } 1,00,000$$

$$\text{P/V Ratio} = (\text{Contribution} / \text{Sale}) \times 100$$

$$= (1,00,000 / 3,00,000) \times 100 = 33.33 \% \text{ or } 1/3$$

- i) Break-Even Point = Fixed Cost / P/V Ratio
 $= 70,000 / 1/3 = 70,000 \times 3/1 = \text{Rs. } 2,10,000$
- ii) Margin of Safety = Actual sales – Break-Even Sales
 $= 3,00,000 - 2,10,000 = \text{Rs. } 90,000$
- iii) Margin of Safety Ratio = (MOS / Sales) X 100
 $= (90,000 / 3,00,000) \times 100 = 30\%$
- iv) Sales required to earn a desired profit of Rs.10,000 will be
Estimated Sales = (Fixed cost + Desired profit) / P/V Ratio
 $= (70,000 + 10,000) / 1/3 = 80,000 \times 3/1 = \text{Rs. } 2,40,000$

2. You are required to compute (i) Break Even Point (Rs.) (ii) Margin of Safety (MOS) (iii) Margin of Safety Ratio (iv) Sales at a Profit of Rs.10,000 from the following information:

Sales Rs. 3,00,000 ; Variable Cost Rs.2,40,000 ; Fixed Cost Rs. 30,000;

Profit Rs. 30,000

Solution: Break-Even Point (Rs.) = Fixed cost / P/V Ratio

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

$$\text{Contribution} = \text{Sales} - \text{Variable cost} = 3,00,000 - 2,40,000 = \text{Rs. } 60,000$$

$$\text{P/V Ratio} = (60,000 / 3,00,000) \times 100 = 20 \%$$

- i) Break-Even Point (Rs.) = $30,000 / 20\% = 30,000 \times 100/20 = \text{Rs. } 1,50,000$
- ii) Margin of Safety = Actual sales – Break-Even Sales
 $= 3,00,000 - 1,50,000 = \text{Rs. } 1,50,000$
- iii) Margin of Safety Ratio = (MOS / Sales) X 100
 $= (1,50,000 / 3,00,000) \times 100 = 50\%$
- iv) Sales required to earn a desired profit of Rs.10,000 will be
Estimated Sales = (Fixed cost + Desired profit) / P/V Ratio
 $= (30,000 + 10,000) / 20\%$
 $= 40,000 \times 100 / 20 = \text{Rs. } 2,00,000$

3. You are required to compute (i) P/V Ratio (ii) Break Even Point (Rs.)

iii) Sales required to earn a Profit of Rs.4,50,000 from the following:

Fixed Expenses Rs.90,000

Variable Cost per Unit

Direct Materials Rs. 5 per unit

Direct Labour Rs. 2 per unit

Direct Overheads 100 % of Direct Labour.

Selling Price per Unit Rs.12

SOLUTION: Contribution per unit = Selling price per unit – variable cost per unit

$$= 12 - (5+2+2) = 12-9 = \text{Rs.3}$$

i) P/V Ratio = (Contribution Per unit/ Selling price per unit) X 100

$$= (3/ 12) \times 100 = 25\%$$

ii) Break-Even Point (Rs.) = Fixed Expenses / P/V Ratio

$$= 90,000 / 25\% = 90,000 \times 100/25 = \text{Rs.3,60,000}$$

iii) Sales required to earn a profit of Rs.4,50,000 Estimated

sales = (Fixed Cost + Desired Profit)/ P/V Ratio

$$= (90,000+4,50,000) / 25\%$$

$$= 5,40,000 \times 100/25 = \text{Rs.21,60,000}$$

4. You are required to calculate i) P/V Ratio (ii) B.E.P (in Rs.) (iii) B.E.P (in units) (iv) Margin of Safety from the following:

Total Sales Rs.3,60,000; Selling price per unit Rs.100;

Variable cost per unit Rs.50;

Fixed Cost Rs.1,00,000.

SOLUTION:

Contribution per unit = Selling price per unit- Variable cost per unit.

$$= 100 - 50 = \text{Rs.50}$$

i) P/V Ratio = (Contribution per unit / Selling price per unit) X 100

$$= (50/100) \times 100 = 50\%$$

ii) Break-Even Sales (in Rs.) = Fixed cost / P/V Ratio

$$= 1,00,000 / 50\% = 1,00,000 \times 100/50 = \text{Rs.2,00,000}$$

iii) Break-Even Sales (in Units) = Fixed Cost / Contribution per unit

$$= 1,00,000 / 50 = 2,000 \text{ units}$$

iv) Margin of Safety = Actual Sales – Break Even Sales

$$= 3,60,000 - 2,00,000 = \text{Rs.1,60,000}$$

5. You are required to compute

(i) Break Even Point (Rs.) (ii) Sales required to earn a Profit of Rs.20,000

(iii) Profit when sales are Rs.1,25,000 from the following

Information:

Years	Sales (Rs.)	Profit (Rs.)
2000	1,00,000	15,000
2001	1,20,000	23,000

SOLUTION:

(i) **P/V Ratio = (Change in Profit / Change in Sales) X 100**

Change in profit = Current year Profit – Last year profit

$$= 23,000 - 15,000 = \text{Rs.}8,000$$

Change in Sales = Current year sales- Last year Sales

$$= 1,20,000 - 1,00,000 = \text{Rs.}20,000$$

$$\text{P/V Ratio} = (8,000 / 20,000) \times 100 = 40\%$$

(i) Fixed Cost = (Current Year sales X P/V Ratio)- Current year Profit

$$= (1,20,000 \times 40/100) - 23,000$$

$$= 48,000 - 23,000 = \text{Rs.}25,000$$

(ii) Break-Even Point (Rs.) = Fixed Cost / P/V Ratio

$$= 25,000 / 40\% = 25,000 \times 100/40 = \text{Rs.}62,500$$

(iii) Sales required to earn a profit of Rs.20,000

Estimated Sales = (Fixed Cost + Desired Profit) / P/V Ratio

$$= (25,000 + 20,000) / 40\%$$

$$= 45,000 \times 100/40 = \text{Rs.}1,12,500$$

The sales required to earn a profit of Rs.20,000 will be Rs.1,12,500

(iv) Profit at an estimated sales of Rs.1,25,000

Estimated Profit = (Desired Sales X P/V Ratio)- Fixed Cost

$$= (1,25,000 \times 40\%) - 25,000$$

$$= 50,000 - 25,000 = \text{Rs.}25,000$$

The profit at an estimated sales of Rs.1,25,000 will be Rs.25,000

6. The Sales Turnover and profit during two years were given as follows:

Years	Sales (Rs.)	Profit (Rs.)
2003	1,40,000	15,000
2004	1,60,000	20,000

You are required to calculate the following:

- i) Break Even Point (Value)
- ii) Sales required to earn a profit of Rs.40,000
- iii) Profit when Sales are Rs.1,20,000.

SOLUTION:

- (i) **P/V Ratio = (Change in Profit / Change in Sales) X 100**

Change in profit = Current year Profit – Last year profit

$$= 20,000 - 15,000 = \text{Rs.}5,000$$

Change in Sales = Current year sales- Last year Sales

$$= 1,60,000 - 1,40,000 = \text{Rs.}20,000$$

$$\text{P/V Ratio} = (5,000 / 20,000) \times 100 = 25\%$$

Fixed Cost = (Current Year sales X P/V Ratio)- Current year Profit

$$= (1,60,000 \times 25 / 100) - 20,000$$

$$= 40,000 - 20,000 = \text{Rs.}20,000$$

- (ii) **Break-Even Point (Rs.) = Fixed Cost / P/V Ratio**

$$= 20,000 / 25\% = 20,000 \times 100 / 25 = \text{Rs.}80,000$$

- (iii) **Sales required to earn a profit of Rs.40,000**

Estimated Sales = (Fixed Cost + Desired Profit) / P/V Ratio

$$= (20,000 + 40,000) / 25\%$$

$$= 60,000 \times 100 / 25 = \text{Rs.}2,40,000$$

The sales required to earn a profit of Rs.40,000 will be Rs.2,40,000.

- (iv) **Profit at an estimated sales of Rs.1,20,000**

Estimated Profit = (Desired Sales X P/V Ratio)- Fixed Cost

$$= (1,20,000 \times 25\%) - 20,000$$

$$= 30,000 - 20,000 = \text{Rs.}10,000$$

The profit at desired sales of Rs.1,20,000 will be Rs.10,000.

7. The Sales Turnover and profit during two years were given as follows:

Years	Sales (Rs.)	Profit (Rs.)/Loss (Rs.)

2009	38,000	-2,400
2010	65,000	3,000

You are required to calculate the following:

- i) Break Even Point (Value)
- ii) Sales required to earn a profit of Rs.5,000
- iii) Profit/Loss when Sales are Rs.46,000.

SOLUTION:

(i) P/V Ratio = (Change in Profit / Change in Sales) X 100

Change in profit = Current year Profit – Last year profit

$$= 3,000 - (-2,400) = 3,000 + 2,400 = \text{Rs.}5,400$$

Change in Sales = Current year sales- Last year Sales

$$= 65,000 - 38,000 = \text{Rs.}27,000$$

$$\text{P/V Ratio} = (5,400 / 27,000) \times 100 = 20\%$$

Fixed Cost = (Current Year sales X P/V Ratio)- Current year Profit

$$= (65,000 \times 20 / 100) - 3,000$$

$$= 13,000 - 3,000 = \text{Rs.}10,000$$

(ii) Break-Even Point (Rs.) = Fixed Cost / P/V Ratio

$$= 10,000 / 20\% = 10,000 \times 100 / 20 = \text{Rs.}50,000$$

(iii) Sales required to earn a profit of Rs.5,000

Estimated Sales = (Fixed Cost + Desired Profit) / P/V Ratio

$$= (10,000 + 5,000) / 20\%$$

$$= 15,000 \times 100 / 20 = \text{Rs.}75,000$$

The sales required to earn a profit of Rs.40,000 will be Rs.75,000.

(iv) Profit /Loss at an estimated sales of Rs.46,000

Estimated Profit / Loss = (Desired Sales X P/V Ratio)- Fixed Cost

$$= (46,000 \times 20\%) - 10,000$$

$$= 9,200 - 10,000 = -\text{Rs.}800$$

The Loss at a desired sales of Rs.46,000 will be Rs.800.

8. The Sales Turnover and Total cost during two years were given as follows:

Years	Total Sales (Rs.)	Total Cost (Rs.)
2008	42,500	38,700

2009	39,200	36,852
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You are required to calculate the following:

- i) Break Even Point (Value)
- ii) Sales required to earn a profit of Rs.6,000
- iii) Profit when Sales are Rs.47,500.

SOLUTION:

Profit for 2009= Current year sales – Current year Total cost

$$= 39,200 - 36,852 = \text{Rs. } 2,348$$

Profit for 2008=Last year sales – Last year Total cost

$$= 42,500 - 38,700 = \text{Rs.}3,800$$

Change in sales = Current year sales – Last year sales

$$= 39,200 - 42,500 = -3,300$$

Change in Profit = Current year profit – Last year profit

$$= 2,348 - 3,800 = -1,452$$

- i) $P/V \text{ Ratio} = (\text{Change in Profit} / \text{Change in sales}) \times 100$

$$= (-1452 / -3,300) \times 100 = 44\%$$

Fixed Cost = (Last year Sales X P/V Ratio)- Last Year Profit.

$$= (42,500 \times 44\%) - 3,800$$

$$= 18,700 - 3,800 = 14,900$$

- (ii) **Break-Even Sales = Fixed Cost / P/V Ratio**

$$= 14,900 / 44\% = 14,900 \times 100 / 44 = \text{Rs.}33,863.64 = \text{Rs.}33,864$$

- (iii) **Sales required to earn a profit of Rs.6,000**

Estimated Sales = (Fixed Cost + Desired Profit) / P/V Ratio

$$= (14,900 + 6,000) / 44\%$$

$$= 20,900 \times 100 / 44 = \text{Rs.}47,500$$

The Sales required to earn a profit of Rs.6,000 will be Rs.47,500

- (iv) **Profit when sales are Rs.47,500**

Estimated Profit = (Desired Sales X P/V Ratio)- Fixed Cost

$$= (47,500 \times 44\%) - 14,900$$

$$= 20,900 - 14,900 = \text{Rs.}6,000$$

The profit at sales of Rs.47,500 will be Rs.6,000.

UNIT-IV

BUDGETARY CONTROL

Introduction of Budgetary Control:

Budgetary control is the process of determining various budgeted figures for the enterprises for the future period and then comparing the budgeted figures with the actual performance for calculating variances, if any. First of all budgets are prepared and then actual results are recorded. The comparison of budgeted and actual figures will enable to find out discrepancies and take remedial measures at a proper time. The budgetary control is a continuous process which helps in planning and co-ordination. It provides a method of control too. A budget is a means and budgetary control is the end-result.

Definitions of Budgetary Control:

According to Brown and Howard, “Budgetary control is a system of controlling costs which includes the preparation of budgets, co-ordinating the department and establishing the responsibilities, comparing the actual performance with the budgeted (standard performances) and acting upon results to achieve maximum profitability.”

Wheldon characterizes budgetary control as “planning in advance of various functions of a business so that the business as a whole is controlled.”

J.Batty defines budgetary control as “A system which uses budgets as a means of planning and controlling all aspects of producing and/or selling commodities and services.”

According to Welsch, “Budgetary control involves the use of budget and budgetary reports, throughout the period to co-ordinate, evaluate and control day-to-day operations in accordance with the goals specified by the budget.”

Advantages of Budgetary Control:

1. **Maximisation of profit:** The budgetary control aims at the maximization of profits of enterprise. To achieve this aim, a proper planning and co-ordination of different functions is undertaken. There is a proper control over various capital and revenue expenditures. The resources are put to the best possible use.

2. **Co-ordination:** The working of different departments and sectors is properly co-ordinated. The budgets of different departments have a bearing on one another. The co-ordination of various executives and subordinates is necessary for achieving budgeted targets.
3. **Specific Aims:** The plans, policies and goals are decided by the top management. All efforts are put together to reach the common goal of the organization. Every department is given a target to be achieved. The efforts are directed towards achieving some specific aims. If there is no definite aim then the efforts will be wasted in pursuing different aims.
4. **Tool for Measuring Performance:** By providing targets to various departments, budgetary control provides a tool for measuring managerial performance. The budgeted targets are compared to actual results and deviations are determined. The performance of each department is reported to the top management. This system enables the introduction of management by exception.
5. **Economy:** The planning of expenditure will be systematic and there will be economy in spending. The finances will be put to optimum use. The benefits derived for the concern will ultimately extend to industry and then to national economy. The national resources will be used economically and wastage will be eliminated.
6. **Determining weaknesses:** the deviations in budgeted and actual performance will enable the determination of weak spots. Efforts are concentrated on those aspects where performance is less than the stipulated.
7. **Corrective Action:** The management will be able to take corrective measures whenever there is a discrepancy in performance. The deviations will be regularly reported so that necessary action is taken at the earliest. In the absence of budgetary control system the deviations can be determined only at the end of the financial period.
8. **Consciousness:** It creates budget consciousness among the employees. By fixing targets for the employees, they are made conscious of their responsibility. Everybody knows what he is expected to do and he continues with his work uninterrupted.
9. **Reduces Costs:** In the present day competitive world budgetary control has a significant role to play. Every business man tries to reduce the cost of the production for increasing sales. He tries to have those combinations of products where profitability is more.
10. **Introduction of Incentive scheme:** Budgetary control system also enables the introduction of incentive schemes of remuneration. The comparison of budgeted and actual performance will enable the use of such schemes.

Limitations of Budgetary Control:

- 1. Uncertain future:** The budgets are prepared for the future period. Despite best estimates made for the future, the predictions may not always come true. The future is always uncertain and the situation which have to be prepared on the basis of certain assumptions. The future uncertainties reduce the utility of budgetary control.
- 2. Budgetary Revisions Required:** Budgets are prepared on the assumptions that certain conditions will prevail. Because of future uncertainties, assumed conditions may not prevail necessitating the revision of budgetary targets. The frequent revision of targets will reduce the value of budgets and revisions involve huge expenditure too.
- 3. Discourages Efficient Persons:** Under budgetary control system the targets are given to every person in the organization. The common tendency of people is to achieve the targets only. There may be some efficient persons who can precede the targets but they will also feel contented by reaching the targets. So budgets may serve as constraints on managerial initiatives.
- 4. Problem of Co-ordination:** The success of budgetary control depends upon the co-ordination among different departments. The performance of one department affects the results of other departments. To overcome the problem of co-ordination a Budgetary Officer is needed. Every concern cannot afford to appoint a Budgetary Officer. The of co-ordination among different departments results in poor performance.
- 5. Conflict among Different Departments:** Budgetary Control may lead to conflict among functional departments. Every departmental head worries for his department goals without thinking of business goal. Every department tries to get maximum allocations of funds and this raises a conflict among different departments.
- 6. Depends upon Support of Top Management:** Budgetary control system depends upon the support of top management. The management should be enthusiastic for the success of this system and should give full support for it. If at any time there is a lack of support from top management then this system will collapse.

Differences between Fixed Budget and Flexible Budget:

Fixed Budget:

According to ICWA London, “Fixed budget is a budget which is designed to remain unchanged irrespective of the level of activity actually attained.” Fixed budgets are suitable under static conditions. If, sales, expenses and costs can be forecasted with greater accuracy then this budget can be advantageously used.”

Flexible Budget

A Flexible budget consists of a series of budgets for different levels of activities. It therefore, varies with level of activity attained. A flexible budget is prepared after taking into consideration unforeseen changes in the conditions of the business. A flexible budget is defined as a budget which by recognizing the difference between fixed, semi-fixed and variable cost is designed to change in relation to the level of activity.

The Flexible budgets will be useful where level of activity changes from time to time. When the forecasting of the demand is uncertain and the undertaking operates under conditions of shortage of materials, labour etc., then this budget will be more suited.

Differences between Fixed Budget and Flexible Budget

Basis of Distinction	Fixed Budget	Flexible Budget
1.Rigidity	A fixed budget remains the same irrespective of changed situations. It remains inflexible even if volume of business is changed.	A flexible budget is recast to suit the changed circumstances. Suitable adjustments are made if the situation so demands.
2.Conditions	A fixed budget assumes that conditions will remain constant.	This budget is changed if the level of activity varies.
3.Cost Classification	In fixed budgets costs are not classified according to their nature.	The costs are studied as per their nature. i.e.,fixed, variable and semi-variable.
4.Change in Volume	If the level of activity changes then budgeted and actual results cannot be compared because of change in basis.	The budgets are redrafted as per the changed volume and a comparison between budgeted and actual figures will be possible.

5. Forecasting	Forecasting of accurate results is difficult.	Flexible budgets clearly show the impact of expenses on operations and it helps in making accurate forecasts.
6. Cost ascertainment	Under changed circumstances costs cannot be ascertained.	The costs can be easily ascertained under different levels of activity. This helps in fixing prices.

BUDGETS AND BUDGETARY CONTROL

Introduction

The first important task in front of the management is to have clearly defined objectives. Objectives are short term as well as long term and they should be defined in clear terms. It is necessary to prepare a comprehensive plan to transform these objectives into reality and planning without controlling will not be effective and hence there is a need of effective control system. While planning helps an organization to work systematically towards achieving the objectives, controlling helps to review the progress made and to monitor whether the work is progressing as per the plan or not. Budgeting is one such technique that helps in planning as well as controlling. It is a technique of cost accounting with the twin objectives of facilitating planning and ensuring controlling. Various aspects of budgets and budgetary control, the types of budgets and the preparation of the same are discussed in detail in this chapter.

Definitions of Budget:

To begin with, let us try to understand the definitions of budget and budgetary control. Budget has been defined by CIMA U.K. as, 'A financial and/or quantitative statement prepared prior to a defined period of time, of the policy to be pursued during that period for the purpose of achieving a given objective.' If we analyze the definition, the following features of budget emerge.

I. A budget is a statement that is always prepared prior to a defined period of time. This means that budget is always prepared for future period and not for the past. For example, a budget for the year 2008-09 regarding the sales will be prepared in the year 2007-08. Another important point is that the time for which it is prepared is certain. Thus a budget may be prepared for next 3 years/1 year/ 6 months/1 month or even for a week, but the point is that the time frame for which it is prepared is certain. It cannot be prepared for indefinite period of time.

II. Budget is prepared either in quantitative details or monetary details or both. This means that budget will show the planning in terms of rupees or in quantity or both. For example, a production budget will show the production target in number of units and when the target units are multiplied by the anticipated production cost, it will be a production cost budget that is expressed in terms of money. Similarly purchase budget is prepared in quantity to show the anticipated purchases in the next year and when the quantity is multiplied by the expected price per unit, it will become a purchase cost budget that is expressed in monetary terms. Some budgets are prepared only in monetary terms, for example, cash budget, capital expenditure budget etc.

III. Every organization has well defined objectives, which are to be achieved in a particular span of time. It is of paramount importance that there should be systematic efforts to bring them into reality. As a part of these efforts, it is necessary to formulate a policy and it is reflected in the budget. Thus if a firm has to launch a massive drive for recruitment of people, this policy will be reflected in the manpower planning budget as well as other relevant budgets. Thus the policy to be pursued in future for the purpose of achieving well-defined objectives is reflected in the budget.

Budgetary Control is actually a means of control in which the actual results are compared with the budgeted results so that appropriate action may be taken with regard to any deviations between the two.

Budgetary control has the following stages.

1. **Developing Budgets:** The first stage in budgetary control is developing various budgets. It will be necessary to identify the budget centre in the organization and budgets will have to develop for each one of them. Thus budgets are developed for functions like purchase, sale, production, manpower planning as well as for cash, capital expenditure, machine hours, labour hours and so on. Utmost care should be taken while developing the budgets. The factors affecting the planning should be studied carefully and budgets should be developed after a thorough study of the same.
2. **Recording Actual Performance:** There should be a proper system of recording the actual performance achieved. This will facilitate the comparison between the budget and the actual. An efficient accounting and cost accounting system will help to record the actual performance effectively.
3. **Comparison of Budgeted and Actual Performance:** One of the most important aspects of budgetary control is the comparison between the budgeted and the actual performance. The objective of such comparison is to find out the deviation between the two and provide the base for taking corrective action.
4. **Corrective Action:** Taking appropriate corrective action on the basis of the comparison between the budgeted and actual results is the essence of budgeting. A

budget is always prepared for future and hence there may be a variation between the budgeted results and actual results. There is a need for investigation of the same and take appropriate action so that the deviations will not repeat in the future. Responsibilities can be fixed on proper persons so that they can be held responsible for any such deviations.

Objectives of Budgeting

An effective budgeting system plays a crucial role in the success of a business organization. The budgeting system has the following objectives, which are of paramount importance in the overall efficiency and effectiveness of the business organization. These objectives are discussed below:

1. **Planning:** Planning is necessary for doing any work in a systematic manner. A well-prepared plan helps the organization to use the scarce resources in an efficient manner and thus achieving the predetermined targets becomes easy. A budget is always prepared for future period and it lays down targets regarding various aspects like purchase, production, sales, manpower planning etc. This automatically facilitates planning.
2. **Co-ordination:** For achieving the predetermined objectives, apart from planning, coordinated efforts are required. Budgeting facilitates coordination in the sense that budgets cannot be developed in isolation. For example, while developing the production budget, the production manager will have to consult the sales manager for sales forecast and purchase manager for the availability of the raw material. Production budget cannot be developed in isolation. Similarly the purchase and sales budget as well as other functional budgets like cash, capital expenditure, manpower planning etc cannot be developed without considering other functions. Hence the coordination is automatically facilitated.
3. **Control:** Planning is looking ahead while controlling is looking back. Preparation of budgets involves detailed planning about various activities like purchase, sales, production, and other functions like marketing, sales promotion, manpower planning. But planning alone is not sufficient. There should be a proper system of controlling which will ensure that the work is progressing as per the plan. Budgets provide the basis for such controlling in the sense that the actual performance can be compared with the budgeted performance. Any deviation between the two can be found out and analyzed to ascertain the reasons behind the deviation so that necessary corrective action can be taken to rectify the same. Thus budgeting helps immensely in controlling function.

Benefits of Budgeting:

Budgeting plays an important role in planning and controlling. It helps in directing the scarce resources to the most productive use and thus ensures overall efficiency in the organization. The benefits derived by an organization from an effective system of budgeting can be summarized as given below:

- I. Budgeting facilitates planning of various activities and ensures that the working of the organization is systematic and smooth.
- II. Budgeting is a coordinated exercise and hence combines the ideas of different levels of management in preparation of the same.
- III. Any budget cannot be prepared in isolation and therefore coordination among various departments is facilitated automatically.
- IV. Budgeting helps planning and controlling income and expenditure so as to achieve higher profitability and also act as a guide for various management decisions.
- V. Budgeting is an effective means for planning and thus ensures sufficient availability of working capital and other resources.
- VI. It is extremely necessary to evaluate the actual performance with predetermined parameters. Budgeting ensures that there are well-defined parameters and thus the performance is evaluated against these parameters.
- VII. As the resources are directed to the most productive use, budgeting helps in reducing the wastages and losses.

(Steps involved in the Preparation for) Essentials of Budgetary Control

A budgetary control is extremely useful for planning and controlling as described above. However, for getting these benefits, sufficient preparation should be made. For complete success, a solid foundation should be laid down and in view of this the following aspects are of crucial importance.

- I. **Budget Committee:** For successful implementation of budgetary control system, there is a need of a budget committee. In small or medium size organizations, the budget related work may be carried out by the Chief Accountant himself. Due to the size of the organization, there may not be too many problems in implementation of

the budgetary control system. However, in large size organization, there is a need of a budget committee consisting of the chief executive, budget officer and heads of main departments in the organization. The main functions of the budget committee are to get the budgets prepared and then scrutinize the same, to lay down broad policies regarding the preparation of budgets, to approve the budgets, to suggest for revision, to monitor the implementation and to recommend the action to be taken in a given situation.

II. **Budget Centres:** Establishment of budget centres is another important pre-requisite of a sound budgetary control system. A budget centre is a group of activities or a section of the organization for which budget can be developed. For example, manpower planning budget, research and development cost budget, production and production cost budget, labour hour budget and so on. Budget centres should be defined clearly so that preparation becomes easy.

III. **Budget Period:** A budget is always prepared prior to a defined period of time. This means that the period for which a budget is prepared is decided in advance. Thus a budget may be prepared for three years, one year, six months, one month or even for one week. The point is that the period for which the budget is prepared should be certain and decided in advance. Generally it can be said that the functional budgets like sales, purchase, production etc. are prepared for one year and then broken down on monthly basis. Budgets like capital expenditure are generally prepared for a period from 1 year to 3 years. Thus depending upon the type of budget, the period of the same is decided and it is important that it is decided well in advance.

IV. **Preparation of an Organization Chart:** There should be an organization chart that shows clearly defined authorities and responsibilities of various executives. The organization chart will define clearly the functions to be performed by each executive relating to the budget preparation and his relationship with other executives. The organization chart may have to be adjusted to ensure that each budget center is controlled by an appropriate member of the staff.

V. **Budget Manual:** A budget manual is defined by ICMA as 'a document which sets out the responsibilities of the person engaged in, the routine of and the forms and records required for budgetary control'.

The budget manual thus is a schedule, document or booklet, which contains different forms to be used, procedures to be followed, budgeting organization details, and set of instructions to be followed in the budgeting system. It also lists out details of the responsibilities of different persons and the managers involved in the process. A typical budget manual contains the following.

- _ Objectives and managerial policies of the business concern.
- _ Internal lines of authorities and responsibilities.
- _ Functions of the budget committee including the role of budget officer.
- _ Budget period

- _ Principal budget factor
- _ Detailed program of budget preparation
- _ Accounting codes and numbering
- _ Follow up procedures.

VI. Principal Budget Factor or Key Factor: A key factor or a principal budget factor [also called as constraint] is that factor the extent of whose influence must first be assessed in order to prepare the functional budgets. Normally sales is the key factor or principal budget factor but other factors like production, purchase, skilled labor may also be the key factors. For example, a company has production capacity to produce 30,000 tones per annum but if the sales forecast tells that the market can absorb only 20,000 units, there is no point in producing 30,000 units. Thus the sale is the key factor in this case. On the other hand, if the company has capacity to produce 30,000 units and the market has the capacity to absorb the entire production which means that sales is not the key factor but if raw material is available in limited quantity so that only 25,000 units can be produced, the raw material will become the key factor. The key factor puts restrictions on the other functions and hence it must be considered carefully in advance. So continuous assessment of the business situation becomes necessary. In all conditions the key factor is the starting point in the process of preparation of budgets. A typical list of some of the key factors is given below:

- _ **Sales:** Consumer demand, shortage of sales staff, inadequate advertising
- _ **Material:** Availability of supply, restrictions on import
- _ **Labor:** Shortage of labor
- _ **Plant:** Availability of capacity, bottlenecks in key processes
- _ **Management:** Lack of capital, pricing policy, shortage of efficient executives, lack of know-how, faulty design of the product etc.

VII. Establishment of Adequate Accounting Records: It is essential that the accounting system should be able to record and analyze the transactions involved. A chart of accounts or accounts code should be maintained which may correspond with the budget centres for establishment of budgets and finally control through budgets.

Types of Budgets

Budgets can be classified as per the following basis.

On the basis of Area of Operation

- A. Functional Budgets
- B. Master Budget

On the basis of Capacity Utilization

- A. Fixed Budget
- B. Flexible Budgets

On the basis of Time

- A. Short Term
- B. Medium Term
- C. Long Term

On the basis of Conditions

- A. Basic Budget
- B. Current Budget

These budgets are discussed in detail in the following paragraphs.

_ Classification according to Area of Operation

A. **Functional Budgets:** The functional budgets are prepared for each function of the organization. These budgets are normally prepared for a period of one year and then broken down to each month. The following budgets are included in this category.

_ **Sales Budget:** A Sales Budget shows forecast of expected sales in the future period [the period is well-defined] and expressed in quantity of the product to be sold as well as the monetary value of the same. A Sales Budget may be prepared product wise, territories/area/country wise, customer group wise, salesmen wise as well as time wise like quarter wise, month wise, weekly etc. The following factors are taken into consideration while preparing a sales budget.

_ **Analysis of past sales:** Analysis of sales for the last 5-10 years will provide valuable information like the long term trend, seasonal trends, cyclical fluctuations and other relevant information like customer preference analysis, shift in demand, competition and other environmental factors. This information can be used to predict the likely future demand of the product.

_ **Estimates given by the sales staff:** Sales staff of the business organization works in the field and hence they know the market situation very well. They have very close interaction with the market and are in a better position to know the demand pattern and other such trends.

However, care is to be taken that the subjective element in the sales estimates given by the sales staff should be eliminated to arrive at a realistic sales forecast.

_ **Market Potential Analysis:** Marketing Research helps any business organization to collect the data regarding markets, demand pattern, customer preferences, market potential and other factors like economic factors and environmental factors. From this analysis, market potential can be worked out which will be used in the sales budget.

_ **Dependent Factor:** Demand of a product is dependent upon certain factors. For example, the demand for petrol and diesel is dependent on the number of vehicles plying though the roads. Analysis of such dependent factor will help to prepare the sales forecast which can be used in the sales budget.

Production Budget / Material Purchase Budget:

This budget shows the quantity of materials to be purchased during the coming year. For the preparation of this budget, production budget is the starting point if it is the key factor. If the raw material availability is the key factor, it becomes the starting point. The desired closing inventory of the raw materials is added to the requirement as per the production budget and the opening inventory is subtracted from the gross requirements. This budget is prepared in quantity as well as in the monetary terms and helps immensely in planning of the purchases of raw materials. Availability of storage space, financial resources, various levels of materials like maximum, minimum, re-order and economic order quantity are taken into consideration while preparing this budget. A separate material utilization budget may also be prepared as a preparation of material purchase budget.

Cash Budget:

A cash budget is an estimate of cash receipts and cash payments prepared for each month. In this budget all expected payments, revenue as well as capital and all receipts, revenue and capital are taken into consideration. The main purpose of cash budget is to predict the receipts and payments in cash so that the firm will be able to find out the cash balance at the end of the budget period. This will help the firm to know whether there will be surplus cash or deficit at the end of the budget period. It will help them to plan for either investing the surplus or raise necessary amount to finance the deficit. Cash Budget is prepared in various ways, but the most popular form of the same is by the method of Receipt and Payment method.

Other Functional Budgets:

In addition to the budgets discussed above, the following are other functional budgets.

Direct Labor Budget: The labor budget estimates the labor required for smooth and uninterrupted production. The labor budget shows the number of each type or grade of workers required in each period to achieve the budgeted output, budgeted cost of such labor, period wise and period of training necessary for different types of labor.

– ***Factory Overhead Budget:*** This budget is prepared for planning of the factory overheads to be incurred during the budget period. In this budget the overheads should be shown department wise so that responsibility can be fixed on proper persons. Classification of factory overheads into fixed and variable components should also be shown in this budget.

– ***Administrative Overhead Budget:*** This budget covers the administrative costs for non-manufacturing business activities. The administrative overheads include expenses like office expenses, office salaries, directors' remuneration, legal expenses, audit fees, rent, interest, property taxes, postage, telephone, telegraph etc. These expenses should be classified properly under different headings to determine the responsibilities regarding cost control and reduction.

– ***Capital Expenditure Budget:*** Capital expenditure is incurred with a long - term perspective and with the objective of augmenting the earning capacity of the firm in the long run. Capital expenditure results in either acquisition of fixed asset or permanent improvement in the existing fixed assets. Another important feature of

capital expenditure is that the amount involved is very heavy and the decision to incur capital expenditure is not reversible. Hence a careful planning is required before decision to incur capital expenditure is taken. In the budget of capital expenditure, apart from the planning of incurring the expenditure, evaluation of the same is also shown. This budget therefore becomes extremely crucial as it not only plans the expenditure but also evaluates the same and helps in arriving at a decision.

– **Manpower Planning Budget:** This budget shows the requirement of manpower in the budget period. The categories in which manpower is required are also shown in this budget. The requirement of manpower depends on the expansion plans of the organization and also on the expected separations during the budget period.

– **Research and Development Cost Budget:** This budget is one of the important tools for planning and controlling research and development costs. It helps management in planning the research and development activities well in advance and also about the fairness of the expenditure. Research and development is one of the important activities of any firm and hence proper planning and coordination is required for effectiveness of the same. This budget also helps to plan the requirement of necessary staff for carrying out research and development.

B. **Master Budget:** All the budgets described above are called as 'Functional Budgets' that are prepared for planning of the individual function of the organization. For example, budgets are prepared for Purchase, Sales, Production, Manpower Planning, and so on. A Master Budget which is also called as 'Comprehensive Budget' is a consolidation of all the functional budgets. It shows the projected Profit and Loss Account and Balance Sheet of the business organization. For preparation of this budget, all functional budgets are combined together and the relevant figures are incorporated in preparation of the projected Profit and Loss Account and Balance Sheet. Thus Master Budget is prepared for the entire organization and not for individual functions.

– **Fixed and Flexible Budgets:** The fixed and flexible budgets are discussed in detail in the following paragraphs.

– **Fixed Budgets:** When a budget is prepared by assuming a fixed percentage of capacity utilization, it is called as a fixed budget. For example, a firm may decide to operate at 90% of its total capacity and prepare a budget showing the projected profit or loss at that capacity. This budget is defined by The Institute of Cost and Management Accountants [U.K.] as 'the budget which is designed to remain unchanged irrespective of the level of activity actually attained. It is based on a single level of activity.' For preparation of this budget, sales forecast will have to be prepared along with the cost estimates. Cost estimates can be prepared by segregating the costs according to their behaviour i.e. fixed and variable. Cost predictions should be made element wise and the projected profit or loss can be worked out by deducting the costs from the sales revenue. Actually in practice, fixed budgets are prepared very rarely. The main reason is that the actual output differs from the budgeted output significantly. Thus if the budget is prepared on the assumption of producing 50,000 units and actually the number of units produced are 40,000, the comparison of actual

results with the budgeted ones will be unfair and misleading. The budget may reveal the difference between the budgeted costs and actual costs but the reasons for the deviations may not be pointed out. A fixed budget may be prepared when the budgeted output and actual output are quite close and not much deviation exists between the two. In such cases, maximum control can be exercised between the budgeted performance and actual performance.

- _ **Flexible Budgets:** A flexible budget is a budget that is prepared for different levels of capacity utilization. It can be called as a series of fixed budgets prepared for different levels of activity. For example, a budget can be prepared for capacity utilization levels of 50%, 60%, 70%, 80%, 90% and 100%. The basic principle of flexible budget is that if a budget is prepared for showing the results at say, 15,000 units and the actual production is only 12,000 units, the comparison between the expenditures, budgeted and actual will not be fair as the budget was prepared for 15,000 units. Therefore a flexible budget is developed for a relevant range of production from 12,000 units to 15,000 units. Thus even if the actual production is 12,000 units, the results will be comparable with the budgeted performance of 12,000 units. Even if the production slips to 8,000 units, the manager has a tool that can be used to determine budgeted cost at 9,000 units of output. The flexible budget thus, provides a reliable basis for comparisons because it is automatically geared to changes in production activity. Thus a flexible budget covers a range of activity, it is flexible i.e. easy to change with variation in production levels and it facilitates performance measurement and evaluation.
- _ While preparing flexible budget, it is necessary to study the behavior of costs and divide them in fixed, variable and semi variable. After doing this, the costs can be estimated for a given level of activity.
 - _ It is also necessary to plan the range of activity. A firm may decide to develop flexible budget for activity level starting from 50% to 100% with an interval of 10% in between. It is necessary to estimate the costs and associate them with the chosen level of activity.
- _ Finally the profit or loss at different levels of activity will be computed by comparing the costs with the revenues.

Classification of Budgets According to Time: According to this classification, budgets are divided in the following categories.

- o **Short Term Budget:** Any budget that is prepared for a period up to one year is known as Short Term Budget. Functional budgets are normally prepared for a period of one year and then it is broken down month wise.
- o **Medium Term Budget:** Budget prepared for a period 1-3 years is Medium Term Budget. Budgets like Capital Expenditure, Manpower Planning are prepared for medium term.
- o **Long Term Budgets:** Any budget exceeding 3 years is known as Long Term Budgets. Master Budget is normally prepared for long term. In the modern days due to uncertainty, very few budgets are prepared for long term.

ZERO BASE BUDGETING

- ***Zero Base Budgeting:*** Zero Base Budgeting is method of budgeting whereby all activities are reevaluated each time budget is formulated and every item of expenditure in the budget is fully justified. Thus the Zero Base Budgeting involves from scratch or zero.

Zero based budgeting [also known as priority based budgeting] actually emerged in the late 1960s as an attempt to overcome the limitations of incremental budgeting. This approach requires that all activities are justified and prioritized before decisions are taken relating to the amount of resources allocated to each activity. In incremental budgeting or traditional budgeting, previous year's figures are taken as base and based on the same the budgeted figures for the next year are worked out. Thus the previous year is taken as the base for preparation of the budget. However the main limitation of this system of budgeting is that an activity is continued in the future only because it is being continued in the past. Hence in Zero Based Budgeting, the beginning is made from scratch and each activity and function is reviewed thoroughly before sanctioning the same and all expenditures are analyzed and sanctioned only if they are justified. Besides adopting a 'Zero Based' approach, the Zero Based Budgeting also focuses on programs or activities instead of functional departments based on line items, which is a feature of traditional budgeting. It is an extension of program budgeting. In program budgeting, programs are identified and goals are developed for the organization for the particular program. By inserting decision packages in the system and ranking the packages, the analysis is strengthened and priorities are determined.
- ***Applications of Zero Based Budgeting:*** The following stages/steps are involved in the application of Zero Based Budgeting.
 - Each separate activity of the organization is identified and is called as a decision package. Decision package is actually nothing but a document that identifies and describes an activity in such a manner that it can be evaluated by the management and rank against other activities competing for limited resources and decide whether to sanction the same or not.
 - It should be ensured that each decision package is justified in the sense it should be ascertained whether the package is consistent with the goal of the organization or not.
 - If the package is consistent with the overall objectives of the organization, the cost of minimum efforts required to sustain the decision should be determined.
 - Alternatives for each decision package are considered in order to select better and cheaper options.

- Based on the cost and benefit analysis a particular decision package/s should be selected and resources are allocated to the selected package.



- **Benefits from Zero Based Budgeting:** ZBB was first introduced by Peter A. Pyhrr, a staff control manager at Texas Instruments Corporation, U.S.A. He developed this technique and implemented it for the first time during the year 1969-70 in Texas in the private sector and popularized its wider use. He wrote an article on ZBB in Harvard Business Review and later wrote a book on the same. The ZBB concept was first applied in the State of Georgia, U.S.A. when Mr. Jimmy Carter was the Governor of the State. Later after becoming the President of U.S.A. Mr. Carter introduced and implemented the ZBB in the country in the year 1987.

ZBB has a wide application not only in the Government Departments but also in the private sector in a variety of business. In India, the ZBB was applied in the State of Maharashtra in 80s and early 90s. Benefits from ZBB can be summarized in the following manner.

1. ZBB facilitates review of various activities right from the scratch and a detailed cost benefit study is conducted for each activity. Thus an activity is continued only if the cost benefit study is favorable. This ensures that an activity will not be continued merely because it was conducted in the previous year.
2. A detailed cost benefit analysis results in efficient allocation of resources and consequently wastages and obsolescence is eliminated.
3. A lot of brainstorming is required for evaluating cost and benefits arising from an activity and this results into generation of new ideas and also a sense of involvement of the staff.
4. ZBB facilitates improvement in communication and co-ordination amongst the staff.
5. Awareness amongst the managers about the input costs is created which helps the organization to become cost conscious.
6. An exhaustive documentation is necessary for the implementation of this system and it automatically leads to record building.

- **Limitations of Zero Based Budgeting:** The following are the limitations of Zero Based Budgeting.

1. It is a very detailed procedure and naturally if time consuming and lot of paper work is involved in the same.
2. Cost involved in preparation and implementation of this system is very high.
3. Morale of staff may be very low as they might feel threatened if a particular activity is discontinued.
4. Ranking of activities and decision-making may become subjective at times.
5. It may not be advisable to apply this method when there are non-financial considerations, such as ethical and social responsibility because this will dictate rejecting a budget claim on low ranking projects.

Performance Budgeting: It is budgetary system where the input costs are related to the performance i.e. the end results. This budgeting is used extensively in the Government and Public Sector Undertakings. It is essentially a projection of the Government activities and expenditure thereon for the budget period. This budgeting starts with the broad classification of expenditure according to functions such as education, health, irrigation, social welfare etc. Each of the functions is then classified into programs sub classified into activities or projects. The main features of performance budgeting are as follows.

- _ Classification into functions, programs or activities
- _ Specification of objectives for each program
- _ Establishing suitable methods for measurement of work as far as possible.

_ Fixation of work targets for each program. Objectives of each program are ascertained clearly and then the resources are applied after specifying them clearly. The results expected from such activities are also laid down. Annual, quarterly and monthly targets are determined for the entire organization. These targets are broken down for each activity centre. The next step is to set up various productivity or performance ratios and finally target for each program activity is fixed. The targets are compared with the actual results achieved. Thus the procedures for the performance budgets include allocation of resources, execution of the budget and periodic reporting at regular intervals. The budgets are initially compiled by the various agencies such as Government Department, public undertakings etc. Thereafter these budgets move on to the authorities responsible for reviewing the performance budgets. Once the higher authorities decide about the funds, the amount sanctioned is communicated and the work is started. It is the duty of these agencies to start the work in time, to ensure the regular flow of expenditure, against the physical targets, prevent over runs under spending and furnish report to the higher authorities regarding the physical progress achieved. In the final phase of performance budgetary process, progress reports are to be submitted periodically to higher authorities to indicate broadly, the physical performance to be achieved, the expenditure incurred and the variances together with explanations for the variances.

PROBLEM ON PRODUCTION BUDGET

Production (in units) = sales – opening stock + closing stock

Problem No.1: Prepare a production budget for each month and summarized production cost budget for 6 months ending 31-12-2005 from the following data of product X.

- i. Units to be sold for different months as follows:

July 2005	1,100
Aug 2005	1,100
Sept 2005	1,700
Oct 2005	1,900
Nov 2005	2,500

PROBLEM ON CASH BUDGET

Problem No. 2 A company is expecting to have rs.32,000 cash in hand on 1-4-2005 and it request you to prepare cash budget for 3 months i.e; april to june 2005. The following information is supplied to you.

Months	Sales	Purchases	Wages	Expenses
Feb	70,000	44,000	6,000	5,000
Mar	80,000	56,000	9,000	6,000
April	96,000	60,000	9,000	7,000
May	1,00,000	68,000	11,000	9,000
June	1,20,000	62,000	14,000	9,000

Other information:

- i. 2months credit is allowed by suppliers.
- ii. 25% of sales if for cash and 1 month credit is allowed to customers.
- iii. Delay in the payment of expenses & wages for one month.
- iv. Income tax of re.28,000 paid in june 2005.

Solution: Cash budget for 3 months from April – june 2005

Particulars	2005		
	April	May	June
Balance b/d	32,000	57,000	1,87,000
Add: Cash Receipts			
Cash sales (25%)	24,000	25,000	30,000
Cash received from debtors (75% of previous month)	60,000	72,000	75,000
Total ash available	1,16,000	1,54,000	1,87,000
Less: Cash payments			
cash paid to creditors	44,000	56,000	60,000
payment of wages	9,000	9,000	11,000
payment of expenses	6,000	7,000	9,000
income tax paid	-	-	28,000
Total payments	59,000	72,000	1,08,000
Closing balance of cash	57,000	82,000	79,000

PROBLEM ON FLEXIBLE BUDGET:

Problem No.3: The following information at 50% of capacity is given. Prepare a flexible budget and farecast profit/loss at 60%, 70% and 90% capacities.

Expenses	@ 50% capacity
<u>Fixed expenses</u>	
Salaries	50,000
Rent & rates	40,000
Depreciation	60,000

Admin expenses	70,000
<u>Variable expenses</u>	
Direct material	2,00,000
Labour	2,50,000
Other expenses	40,000
<u>Semi-variable expenses</u>	
Repairs	1,00,000
Indirect labour	1,50,000
Other expenses	90,000

Other information:

- i. It is estimated that fixed expenses will remain constant at all capacities.
- ii. Semi-variable expenses will not change between 45% & 60% , capacity will raise by 10% between 60% & 75% and further increase of 5% when capacity crosses 75%
- iii. Estimated sales of various capacities are given as follows:
 At 60% capacity sales will be 11,00,000
 At 70% capacity sales will be 13,00,000
 At 90% capacity sales will be 15,00,000.

Solution:

FLEXIBLE BUDGET

Particulars	levels of capacity			
	50%	60%	70%	90%
<u>Fixed expenses</u>				
salaries	50,000	50,000	50,000	50,000
rent & rates	40,000	40,000	40,000	40,000
depreciation	60,000	60,000	60,000	60,000
admin expenses	70,000	70,000	70,000	70,000
<u>Variable expenses</u>				
direct material	2,00,000	2,40,000	2,80,000	3,60,000
labour	2,50,000	3,00,000	3,50,000	4,50,000
other expenses	40,000	48,000	56,000	72,000
<u>Semi-variable expenses</u>				
repairs	1,00,000	1,00,000	1,10,000	1,15,000
indirect labour	1,50,000	1,50,000	1,65,000	1,72,500
other expenses	90,000	90,000	99,000	1,03,500
TOTAL COST	-	11,48,000	12,80,000	1,49,300
profit/loss	-	-48,000	20,000	7,000
SALES	-	11,00,000	13,00,000	15,00,000

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STANDARD COSTING

Definitions of Standard Costing:

1. According to Backer and Jocobsen, “Standard cost is the amount of firm thinks a product or operation of a process for a period of time should cost, based upon certain assumed conditions of efficiency, economic conditions and other factors”.
2. According to Brown and Howard, standard costing may be defined as “a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation so that any remedial action may be taken immediately.”
3. According to The Terminology of Cost Accountancy defines Standard costing as “the preparation and use of standard costs, their comparison with actual costs, and the analysis of variance to their causes and points of incidence”.
4. According to London Institute of Cost and Works Accounts, standard costing as “an estimate cost, prepared in advance of production or supply correlating a technical specification of material and labour to the price and wage rates estimated for a selected period of time within a prescribed set of working conditions”.

Significance of Standard Costing:

1. Measuring Efficiency:

Standard costing is a yardstick for measuring efficiency. The comparison of actual cost with standard costs enables the management to evaluate performance of various cost centres. In the absence of standard costing system actual costs of different periods may be compared to measure efficiency. It is not proper to compare costs of different periods because circumstances of both the periods may be different. Moreover, a decision about base period with which the comparison is to be made is also difficult to be made. Standard costing gives targets with which actual performance can be compared.

2. Formulation of Production and Price Policy:

Standard costing is helpful in formulating production policies. The standards are set by studying all existing conditions. It becomes easy to formulate production plans by taking into account standard costs. It is also helpful for finding prices of various products. In case tenders are to be submitted or prices are to be quoted in advance then standard costing produces necessary data for price fixation.

3. Determination of Variance:

By comparing actual costs with standard costs variances are determined. Management is able to spot out the place of inefficiencies. It can fix responsibility for deviation in performance. It is possible to corrective actions/ measures earliest. A regular check on various expenditures is also ensured by standard costing system.

4. Reduction of work:

In historical costing, records are maintained for determining costs. Standard costing reduces clerical work to a considerable extent and management is supplied with useful information. In this system only necessary information will be recorded and superfluous data are avoided. The report presentation is simplified and only required information is presented in such a form that management is able to interpret the information easily and useful.

5. Management by Exception:

With the use of standard costing, the targets of different individuals are fixed. If the performance is according to predetermined standards then there is nothing to worry. The attention of management is drawn only when actual performance is less than the budgeted performance. Management by exception means that everybody is given a target to be achieved and management need not supervise each and everything. The responsibilities are fixed and everybody tries to achieve his targets. If the things are not going as per targets then management need not bother. Management devotes its time to other important things. So management by exception is possible only when targets of work can be fixed. Standard costing enables the determination of targets.

6. Facilitates Cost Control:

Every costing system aims at cost control and cost reduction. Standard costing helps in achieving these aims. The standards are being constantly analysed and an effort is made to improve efficiency. Whenever a variance occurs the reasons are studied and immediate corrective measures are undertaken. The action taken in spotting weak points enables cost control system.

7. Eliminating Inefficiencies:

The setting of standard for different elements of cost requires a detailed study of different aspects. The standards are differently set for manufacturing, administrative and selling expenditure. Improved methods are used for setting these standards. The determination of manufacturing expenses will require time and motion study for labour and effective control devices for materials etc. Similar studies will be needed for finding other expenses. All these studies will make it possible to eliminate inefficiencies at different steps. The whole effort will give an improved costing system and will enable better service to the consumer.

8. Helpful in Taking important Decisions:

Standard costing provides useful information to the management in taking important decisions. The problem created by inflation, rising prices etc. can be effectively tackled with the help of standard costing. It can also be used to provide incentive plans for employees, etc

Limitations of Standard Costing:

1. Standard costing cannot be used in those concerns where non-standard products are produced. If the production is undertaken according to customer's specifications then each job will involve different amount of expenditure. Under such circumstances it is not possible to set up standards for every job. Standard costing can be used only in those concerns where standard products are manufactured.
2. The process of setting up standards is a different task as it requires technical skill. The time and motion study is required to be undertaken for this purpose. These studies require a lot of time and money.
3. There are no inset circumstances to be considered for fixing standards. The conditions under which standards are fixed do not remain static. With the change circumstances the standards are also to be revised. The revision of standards is a costly affair. In case the standards are not revised the same become impracticable.
4. This system is expensive and small concerns may not afford to bear the cost. For small concerns the utility from this system may be less than the cost involved in it.
5. The fixing of responsibility is not an easy task. The variances are to be classified into controllable and uncontrollable variances. The responsibility can be fixed only for controllable variances. The determination of controllable and uncontrollable variances will be a problem. The variances may be controllable at one point of time and may become uncontrollable at another point of time. The problem is faced whenever a responsibility is to be fixed.
6. The industries liable for frequent technological changes will not be suitable for standard costing system. The change in production process will require a revision of standard. A frequent revision of standard will be costly. So this system will not be useful for industries where methods and techniques for production are fast changing.

3Q. Distinguish between Standard Costing and Budgetary Control.

Differences between Standard Costing and Budgetary Control.

Point of Difference	Standard Costing	Budgetary Control
1. Concept	In standard costing, unit concept is used. The standard cost is fixed for one product and different standards are used for different products.	In budgetary control the budgets are prepared for the concern as a whole. In budgetary control total concept is used. The whole concern is taken as one unit for budgets. The actual figures for the whole concern are compared with predetermined budgeted figures. In case of

		Government, the budgets are fixed for the whole country or state.
2. Basis	Standard costs are fixed on the basis of technical information. Standard costs are planned costs and these are expected in future.	The budgets are fixed on the basis of past records and future expectations.
3. Scope	Standards are set up for expenditures only and therefore, for manufacturing departments standards are set for different elements of cost i.e, material, labour and overheads.	The scope of budgetary control is much wider than the scope of Standard costing. Budgets are prepared for incomes, expenditure and other activities. Budgets are prepared for different functional departments such as purchase, sale, production, finance and personal department. One budget is known as Master budget.
4. Emphasis	In standard costing the standards are set and an attempt is made to achieve these standards. The emphasis is on achieving the standards. Actual costs may be more than standard costs and there can be no such thing in budgetary control.	In budgetary control, the targets of expenditure are set and these targets cannot be exceeded. In this system the emphasis is on keeping the expenditures within the budgeted figures.
5. Objective	Budgets are set on the basis of present level of efficiency while standard costs are based on the standards set by the management.	The standards are related to what management wants to achieve.
6. Relationship	Standard costing is related to cost accounts.	Budgetary control is related to financial accounts.
7. Use	Standard costing control be used for forecasting purposes only.	Budgets are used for forecasting purposes. The forecasts about income, expenses and costs are based on historical figures and expected changes in future.
8. Variance Analysis	In standard costing variances are calculated for different elements of cost i.e., material, labour and overheads. In standard costing variances are	Budgetary control deals with total variances only. The variance may be calculated for different departments or for the

	studied according to their causes. An independent study is possible for determining causes of variances and it will be very helpful for cost control purpose.	concern as a whole.
9. Elements	Standard costing cannot be used partially; it will have to be used wholly. The standards will have to be set for all elements of cost.	The budgetary control system can be applied partly or wholly. Budgets may be prepared for some departments and may not be prepared for all departments. If a concern is interested in preparing production budget only. It is free to do so.

Standard Cost is defined as, ‘a pre-determined cost which is calculated from management’s standard of efficient operation and the relevant necessary expenditure. It may be used as a basis for price fixation and for cost control through variance analysis.’ [CIMA – UK] Standard Costing is defined as, ‘preparation and use of standard costs, their comparison with actual costs and analysis of variances into their causes and points of incidences.’ [CIMA – UK] From the definitions given above, the following features of standard cost and standard costing emerge. Meaning of both the terms will be clearer by going through carefully these features.

Features of Standard Cost and Standard Costing

The following are the features of standard cost:

- Standard cost is a pre-planned or pre-determined cost. This means that the standard cost is determined even before the commencement of production. For example, if a firm is planning to launch a product in the year 2009, the standard cost of the same will be determined in the year 2008.
- Standard cost is not an estimated cost. There is a difference between saying what would be the cost and what should be the cost. Standard cost is a planned cost and it is a cost that should be the actual cost of production.
- It is calculated after taking into consideration the management’s standard of efficient operation. Thus standard cost fixed on the assumption of 80% efficiency will be different from what it will be if the assumption is of 90% efficiency.
- Standard cost can be used as a basis for price fixation as well as for exercising control over the cost.

Standard Costing is a technique of costing rather than a method and has the following features:

- Standard costing involves setting of standards for various elements of cost. Thus standards are set for material costs, labour costs and overhead costs. Setting of standard is the heart of standard costing and so this work is done very carefully. Setting of wrong standards will defeat the very purpose of standard costing. Standards are not only set for costs, but also for sales and profits. The objective behind setting of standards is to have a basis for comparison between the standard performance and the actual performance.
- Another feature of standard costing is to continuously record the actual performance against the standards so that comparison between the two can be done easily.
- Standard costing ensures that there is a constant comparison between the standards and actual and the difference between the two is worked out. The difference is known as variance' and it is to be analysed further to find out the reasons behind the same.
- After the ascertaining of the variances, analyzing them to find out the reasons for the variances and taking corrective action in order to ensure that the variances are not repeated, are the two important actions of management. Thus standard costing helps immensely in evaluation of performance of the organization.
- Estimated costs should not be confused with standard costs. Though both of them are future costs, there is a fundamental difference between the two. Estimated cost is more or less a reasonable assessment of what the cost will be in future while on the other hand, standard cost is a pre planned cost in the sense it denotes what the cost ought to be. Estimated costs are developed on the basis of projections based on past performance as well as expected future trends. Standard costs are pre determined in a scientific manner through technical analysis regarding the material consumption and time and motion study for determining labour requirements. Estimated costs may not help management in decision making as they are not scientifically pre determined costs but standard costs are decided after a comprehensive study and analysis of all relevant factors and hence provide reliable measures for product costing, product pricing, planning, co-ordination and cost control as well as reduction purposes. Under estimated costing, the cost is estimated in advance and is based on the assumption that costs are more or less free to move and that what is made is the best estimate of the cost. Under standard costing, a cost is established which is based on the assumption that cost will not be allowed to move freely but will be controlled as far as possible so that the actual cost will be close to the standard cost as far as possible and any variation between the standard and actual cost will be capable of reasonable explanation.

VARIANCE ANALYSIS

Computation of Variances

After setting the standards and standard costs for various elements of cost, the next important step is to compute variances for each element of cost. Variance is the difference between the standard cost and the actual cost. In other words it is the difference between what the cost should have been and what is the actual cost. Element wise computation of variances is given in the following paragraphs.

A] **Material Variances:** In the material variances, the main objective is to find out the difference between the standard cost of material used for actual production and actual cost of material used. Thus the main variance in this category is the cost variance, which is thereafter broken down into other variances. These variances are given below.

1) **Material Cost Variance:**

As mentioned above, this variance shows the difference between the standard cost of material consumed for actual production and the actual cost. The following formula is used for computation of this variance.

Material Cost Variance:

Standard Cost of Material Consumed for Actual Production – Actual Cost

If the actual cost of material consumed is less than the standard cost of material consumed, the variance is 'favourable', otherwise it is adverse.

2) **Material Price Variance:**

One of the reasons for difference between the standard material cost and actual material cost is the difference between the standard price and actual price. Material Price Variance measures the difference between the standard price and actual price with reference to the actual quantity consumed. The computation is as shown below:

Material Price Variance: Actual Quantity [Standard Price – Actual Price]

3) **Material Quantity [Usage] Variance:**

This variance measures the difference between the standard quantity of material consumed for actual production and the actual quantity consumed and the same is multiplied by standard price. The computation is as shown below.

Material Quantity [Usage] Variance:

Standard Price [Standard Quantity – Actual Quantity]

The total of Price Variance and Quantity Variance is equal to Cost Variance

Material Cost Variance = Material Price Variance + Material Quantity Variance.

Problem No.1. Calculate Material Variances from the following details.

Standard quantity of materials for producing 1 unit of finished product 'P' is 5 kg. The standard price is Rs.6 per kg. During a particular period, 500 units of 'P' were produced. Actual material consumed was 2700 kg at a cost of Rs.16, 200.

Solution:

I] Material Cost Variance = Standard Cost of Materials – Actual Cost

500 units _ 5 kg _ Rs.6 – Rs.16, 200

Rs.15, 000 – Rs.16, 200 = Rs.1, 200 [A]

II] Material Price Variance = Actual Quantity [Standard Price – Actual Price]

2, 700 [Rs.6 – Rs.6] = Nil

III] Material Quantity Variance = Standard Price [Std. Qty – Actual Qty]

Rs.6 [2500 – 2700] = Rs.1, 200 [A]

Reconciliation

Material Cost Variance = Material Price Variance + Material Quantity Variance.

Rs.1200 [A] = Rs. Nil + Rs.1, 200 [A]

4) **Material Mix Variance:**

In case of several products, two or more types of raw materials are mixed to produce the final product. In such cases, standard proportion of mixture is decided in advance. For example, in manufacturing one unit of product 'P', material A and B may have to be mixed in a standard proportion of 3:2. This is called as a standard mix. However, when the actual production begins, the actual proportion of mix may have to be changed due to several reasons like non-availability of a particular material etc. In such cases material mix variance arises. The mix variance is computed in the following manner.

• Material Mix Variance = Standard Cost of Standard Mix – Standard Cost of Actual Mix

5) **Material Yield Variance:**

In any manufacturing process, some unavoidable loss always takes place. Thus if the input is 100, output may be 95, 5 units being normal or unavoidable loss. The normal loss is always anticipated and taken into consideration while determining the standard quantity. Yield variance arises when the actual loss is more or less than the normal loss. The computation of yield variance is as given below.

• Material Yield Variance = SYR [Actual Yield – Standard Yield]

SYR = Standard Yield Rate, i.e. standard cost per unit of standard output.

Reconciliation: Quantity Variance = Mix Variance + Yield Variance.

B] **Labour Variances:** Like the material variances, labour variances arise due to the difference between the standard labour cost for actual production and the actual labour cost. The following variances are computed in case of direct labour.

1) **Labour Cost Variance:**

This variance is the main variance in case of labour and arises due to the difference between the standard labour cost for actual production and the actual labour cost. The following formula is used for computation of this variance.

Labour Cost Variance = Standard Labour Cost for Actual Production – Actual Labour Cost

This variance will be favourable if the actual labour cost is less than the standard labour cost and adverse if the actual labour cost is more than the standard labour cost.

2) **Labour Rate Variance:**

One of the reasons for labour cost variance is the difference between the standard rate of wages and actual wages rate. The labour rate variance indicates the difference between the standard labour rate and the actual labour rate paid. The formula for computation is as under.

Labour Rate Variance: Actual Hours Paid [Standard Rate – Actual Rate]

This variance will be favourable if the actual rate paid is less than the standard rate. The labour rate variance is that portion of direct labour cost variance, which is due to the difference between the labour rates.

3) **Labour Efficiency Variance:**

It is of paramount importance that efficiency of labour is measured. For doing this, the actual time taken by the workers should be compared with the standard time allowed for the job. The standard time allowed for a particular job is decided with the help of time and motion study. The efficiency variance is computed with the help of the following formula.

Labour Efficiency Variance = Standard Rate [Standard Hours for Actual Output – Actual Hours worked]

This variance will be favourable if the actual time taken is less than the standard time.

4) **Labour Mix Variance or Gang Composition Variance:**

This variance is similar to the material mix variance and is computed in the same manner. In doing a particular job, there may be a particular combination of labour force, which may consist of skilled, semi skilled and unskilled workers. However due to some practical difficulties, this composition may have to be changed. How much is the loss caused due to this change or how much is the gain due to this change is indicated by this variance. The computation is done with the help of the following formula.

Labour Mix Variance = Standard Cost of Standard Mix – Standard Cost of Actual Mix.

5) **Labour Yield Variance:**

This variance indicates the difference between the actual output and the standard output based on actual hours. In other words, a comparison is made between the actual production achieved and the production that should have been achieved in actual number of working hours. The variance will be favourable if the actual output achieved is more than the standard output. The computation is done in the following manner.

Labour Yield Variance = Average Standard Wage Rate Per Unit [Actual Output – Standard Output]

6) **Idle Time Variance:**

This variance indicates the loss caused due to abnormal idle time. While fixing the standard time, normal idle time is taken into consideration. However if the actual idle time is more than the standard/normal idle time, it is called as abnormal idle time. This variance will be always adverse and will be computed as shown below.

Idle Time Variance = Abnormal Idle Time X Standard Rate.

C] **Overhead Variances:** The overhead variances show the difference between the standard overhead cost and the actual overhead cost. In case of direct material and direct labour variances, there is no question of dividing them into fixed and variable as the direct material and direct labour costs are variable. However, in case of overheads, it is necessary to divide them into fixed and variable for computation of variances. We will take up the fixed overhead variances first and then the variable overhead variances. The fixed overhead variances are discussed in the following paragraphs.

I] **Fixed Overhead Variances:** The following variances are computed in case of fixed overheads.

A. **Fixed Overhead Cost Variance:** This variance indicates the difference between the standard fixed overheads for actual production and the actual fixed overheads incurred. Actually this variance indicates the under/over absorbed fixed overheads. If the actual overheads incurred are more than the standard fixed overheads, it indicates the under absorption of fixed overheads and the variance is favourable. On the other hand, if the actual overheads incurred are more than the standard fixed overheads, it indicates the over absorption of fixed overheads and the variance is adverse. The following formula is used for computation of this variance.

Fixed Overhead Cost Variance: Standard Fixed Overheads for Actual Production – Actual Fixed Overheads.

B. **Fixed Overhead Expenditure/Budget Variance:** This variance indicates the difference between the budgeted fixed overheads and the actual fixed overhead expenses. If the actual fixed overheads are more than the budgeted fixed overheads, it is an adverse variance as it means overspending as compared to the budgeted amount. On the other hand, if the actual fixed overheads are less than the budgeted fixed overheads, it is a favourable variance. This variance is computed with the help of the following formula.

Fixed Overhead Expenditure Variance: Budgeted Fixed Overheads – Actual Fixed Overheads

C] **Fixed Overheads Volume Variance:** This variance indicates the under/over absorption of fixed overheads due to the difference in the budgeted quantity of production and actual quantity of production. If the actual quantity produced is more than the budgeted one, this variance will be favourable but it will indicate over absorption of fixed overheads. On the other hand, if the actual quantity produced is less than the budgeted one, it indicates adverse variance and there will be under absorption of overheads. The formula for computation of this variance is as shown below:

Fixed Overhead Volume Variance: Standard Rate [Budgeted Quantity – Actual Quantity]
Reconciliation I = Fixed Overhead Cost Variance = Expenditure Variance + Volume Variance

D] **Fixed Overhead Efficiency Variance:** It is that portion of volume variance which arises due to the difference between the output actually achieved and the output which should have been achieved in the actual hours worked. This variance will be favourable if the actual production is more than the standard production in actual hours. The formula for computation of this variance is as follows:

Fixed Overhead Efficiency Variance: Standard Rate [Standard Production – Actual Production]

E] **Fixed Overhead Capacity Variance:** This variance is also that portion of volume variance, which arises due to the difference between the capacity utilization, i.e. the capacity actually utilized and the budgeted capacity. If the capacity utilization is more than the budgeted capacity, the variance is favourable, otherwise it will be adverse. The formula is as follows:

Fixed Overheads Capacity Variance: Standard Rate [Standard Quantity – Budgeted Quantity]

Reconciliation II = Volume Variance = Efficiency Variance + Capacity Variance

F] **Fixed Overhead Revised Capacity Variance:** This variance indicates the difference in capacity utilization due to working for more or less number of days than the budgeted one. The computation of this variance is done by using the following formula.

Fixed Overhead Revised Capacity Variance = Standard Rate [Standard Quantity – Revised Budgeted Quantity]

G] **Fixed Overheads Calendar Variance:** This variance indicates the difference between the budgeted quantity of production and actual quantity of production achieved arising due to the difference in the number of days worked and budgeted. The formula for computation of this variance is as follows.

Fixed Overheads Calendar Variance = Standard Rate [Budgeted Quantity – Revised Budgeted Quantity]

II] **Variable Overhead Variances:** The following variances are computed in case of variable overheads.

A] **Variable Overhead Cost Variance:** This variance indicates the difference between the standard variable overheads for actual overheads and the actual overheads. The difference between the two arises due to the variation between the budgeted and actual quantity. The formula for the computation of this variance is as follows:

Variable Overhead Cost Variance = Standard Variable Overheads for Actual Production – Actual Variable Overheads.

B] **Variable Overheads Expenditure Variance:** This variance indicates the difference between

the standard variable overheads to be charged to the standard production and the actual variable overheads. If the actual overheads are less than the standard variable overheads, the variance is favourable, otherwise it is adverse. The formula for the computation is as follows:

Variable Overhead Expenditure Variance = Standard Variable Overheads for Standard Production – Actual Variable Overheads.

C] **Variable Overheads Efficiency Variance:** It indicates the efficiency by comparing between the output actually achieved and the output that should have been achieved in the actual hours

worked. [Standard Production] This variance will be favourable if the actual output achieved is more than the standard output. The formula for computation is given below:

Variable Overheads Efficiency Variance: Standard Rate [Standard Quantity – Actual Quantity]

Important note: All the formulae mentioned above are with reference to the quantity. All overhead variances can also be computed with relation to number of hours. In one of these illustrations, this is demonstrated.

PROBLEM ON OVERHEADS

From the following information extracted from the books of a manufacturing company, calculate Fixed and Variable Overhead Variances.

Particulars Budgeted Actual

Production – Units 22, 000 24, 000

Fixed Overheads Rs.44, 000 Rs.49, 000

Variable Overheads Rs.33, 000 Rs.39, 000

Number of Days 25 26

Number of man hours 25, 000 27, 000

Solution:

A] Fixed Overhead Variances:

I] **Fixed Overhead Cost Variance:** Standard Fixed Overheads for Actual Production – Actual Fixed Overheads = Rs.48, 000 – Rs.49, 000 = Rs.1, 000 [A]

Note: Standard fixed overheads for actual production = Actual Production 24, 000 X standard rate Rs.2 [Rs.44, 000 budgeted fixed overheads / 22, 000 budgeted production = Rs.2]

II] **Fixed Overhead Expenditure Variance:** Budgeted Fixed Overheads – Actual Fixed Overheads = Rs.44, 000 – Rs.49, 000 = Rs.5, 000 [A]

III] **Fixed Overhead Volume Variance:** Standard Rate [Budgeted Quantity – Actual Quantity] =

Rs.2 [22, 000 – 24, 000] = Rs.4, 000 [F]

The variance is favourable as the actual quantity produced is more than the budgeted quantity.

Reconciliation I = Cost Variance = Expenditure Variance + Volume Variance

Rs.1, 000 [A] = Rs.5, 000 [A] + Rs.4, 000 [F]

IV] **Fixed Overhead Efficiency Variance:** Standard Rate [Standard Quantity – Actual Quantity] = Rs.2 [23, 760 – 24, 000] = Rs.480 [F]

Note: Standard quantity of production is in reference to actual number of hours. If 22, 000 units are produced in 25, 000 hrs [standard hours], in actual 27, 000 hours, 23, 760 units should have been produced. When number of days and number of hours, both are given, the standard quantity is always to be computed in relation to the actual hours. However, if only number of days is given, the standard quantity will have to be computed in relation to number of days.

V] **Fixed Overhead Capacity Variance:** Standard Rate [Standard Quantity – Budgeted Quantity] = Rs.2 [23, 760 – 22, 000] = Rs.3, 520 [F]

Reconciliation II = Volume Variance = Efficiency Variance + Capacity Variance

Ra.4, 000 [F] = Rs.480 [F] + 3, 520 [F]

VI] Fixed Overhead Revised Capacity Variance = Standard Rate [Standard Quantity – Revised Budgeted Quantity] = Rs.2 [23, 760 – 22, 880] = Rs.2 X 880 = Rs.1760 [F]

Note: Standard quantity is computed as shown in the Efficiency Variance. Revised Budget Quantity is computed as: in 25 days, the production is 22, 000 so in 26 days the revised quantity is 22, 880 units.

VII] **Fixed Overhead Calendar Variance:** Standard Rate [Revised Budgeted Quantity – Budgeted Quantity] = Rs.2 [22, 880 – 22, 000] = Rs.2 X 880 = Rs.1, 760 [F]

Reconciliation III = Capacity Variance = Revised Capacity Variance + Calendar Variance = Rs.3, 520 [F] = Rs.1760 [F] + Rs.1760 [F]

I] **Cost Variance:** Standard Variable Overheads for Actual Production – Actual Variable Overheads:

Rs.36, 000 – Rs.39, 000 = Rs.3, 000 [A]

Note: Standard Variable Overheads for Actual Production = Standard Rate Per Unit X Actual Production Units = Rs.1.5 [Budgeted variable overheads Rs.33, 000 /Budgeted production units

22, 000 = Rs.1.5] X 24, 000 units = Rs.36, 000

II] **Expenditure Variance:** Standard Variable Overheads for Standard Production – Actual Variable Overheads: Rs.1.5 X 23, 760 – Rs.39, 000 = Rs.3360 [A]

III] **Efficiency Variance:** Standard Rate [Standard Quantity – Actual Quantity]

Rs.1.5 [23, 760 – 24, 000] = Rs.360 [F]

STEPS INVOLVED IN STANDARD COSTING

The technique of standard costing involves the determination of cost beforehand. The cost is based on technical information after considering the impact of current conditions. Cost ascertainment is not based on a guess work. The impact of possible factors on cost is studied before setting the standards. The standards are set as per existing conditions of work. The standard costs subdivided into standards for materials, labour and overheads. The subdivision of standards will be useful for cost control. The actual cost is recorded, when it incurred. The standard cost is compared with the actual cost. The difference between these two costs is known as variance. The variances are calculated element-wise. The management can take corrective measures to set the things right.

From the above discussions it is clear that the standard costing involves the following steps:

1. The determination of standard cost.
2. The recording of actual cost.

3. The comparison between standard cost and actual cost.
4. The finding out of variance.
5. The reporting of variance so as to find out inefficiency and take necessary corrective actions/ measures.

STANDARD COSTING Vs ESTIMATED COSTS

Both the standard costing and estimated costs are used to determine price in advance. The purpose of both systems is to control cost. The same accounting principles are used in standard cost and estimated cost. The points of difference between standard cost and estimated cost are discussed as under:

1. Estimated costs are based on historical accounting. It is an estimate of what the cost will be. It is a cost of guess work or reasonable estimate for the costs in future. On the other hand standard costs are based on scientific analysis and engineering studies. Standard costing determines what the cost should be.
2. Standard costs are used as a device for measuring efficiency. The standards are determined and a comparison of standard with actual costs enables to determine the efficiency of the concern. Estimated costs cannot be used to determine efficiency. It only determines the expected costs. An effort is made that estimated cost should almost be near to actual costs.
3. The purpose of determining estimated costs is to find out selling price in advance to take a decision whether to produce or to make and also to prepare financial budgets. Estimated costs do not serve the purpose of cost control. On the other hand standard costs are helpful in cost control. The analysis of variance enables to take corrective measures, if necessary.
4. Standard costs are not easily changed. The standards are set in such a way that small changes in conditions do not require a change in standards. Estimated costs are revised with the changes in conditions. They are made realistic by incorporating changes in prices. Standard costs are more realistic than estimated costs.
5. Estimated costs are used by the concern using historical costing. Standard costing is used by those concerns which use standard costing system. Standard costing is a part of cost accounting process while estimated costs are statistical in nature and as such may not become a part of accounting.

PROBLEMS ON MATERIAL VARIANCE

1. From the following data calculate various material variances

Materials	Std.Qty(units)	Std.Price(Rs.)	Actual Qty(units)	Actual Price(Rs.)
A	80	8.00	90	7.50
B	70	3.00	80	4.00

	150		170	
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SOLUTION:

1. Material Cost Variance = (Std.Qty X Std.Price)-(Actual Qty. X Actual Price)

A = (80 X 8)- (90X7.50) = 640-675 = -Rs.35

B = (70 X 3) – (80 X 4) = 210-320 = -Rs.110

Total MCV = Rs.145

2. Material Price Variance = A.Q (Std.Price-Actual Price)

A = 90 (8-7.50) = 90 X 0.50 = Rs.45

B = 80 (3-4) = 80 X 1 = - Rs.80

Total M.P.V= -Rs. 35

3. Material Usage Variance = Std. Price (Std.Qty –Actual Qty)

A = 8 (80-90) = 8 X -10 = - Rs.80

B = 3 (70-80) = 3 X -10 = -Rs. 30

Total MUV= -Rs.110

4. Material Mix Variance =

$$\left[\frac{\text{Total weight of Actual Mix}}{\text{Total Weight of Std. Mix}} \times \text{Std. Cost of Std. Mix} - \text{Std. cost of Actual Mix} \right]$$

$$170/150 \times 80 \times 8 + 70 \times 3 - (90 \times 8 + 80 \times 3)$$

= 963.3 – 960 = Rs.3.3 Favourable

PROBLEM ON LABOUR VARIANCE

2. From the following data you are required to compute various Labour variances.

Budgeted Labour composition for producing 100 articles

20 Men @ Rs.1.25 per hour for 24 hours.

30 Women @Rs.1.10 per hour for 30 hours.

Actual Labour composition for producing 100 articles

25 Men @ Rs.1.50 per hour for 24 hours.

25 Women @Rs.1.20 per hour for 25 hours.

Compute (i) Labour Cost Variance (ii) Labour Rate Variance (iii) Labour Efficiency variance (iv) Labour Mix Variance.

1. Labour Cost Variance = Std. Labour Cost- Actual Labour Cost

Men = (20 x25x 1.25)- (25x24x1.50) = 625-900 = -Rs.275

Women = (30 x30x 1.10) – (25 x25x 1.20) = 990-750 = Rs.240

Total LCV = -Rs.35

2. Labour Rate Variance = Actual Time (Std. Rate-Actual Rate)

$$\begin{aligned} \text{Men} &= 600 (1.25-1.50) = 600 \times -0.25 = -\text{Rs.}150.00 \\ \text{Women} &= 625 (1.10-1.20) = 625 \times -0.10 = -\text{Rs.}62.50 \\ \text{Total L.R.V} &= -\text{Rs.}212.50 \end{aligned}$$

3. Labour Efficiency Variance = Std. Rate (Std. Time –Actual Time)

$$\begin{aligned} \text{Men} &= 1.25(500-600) = 1.25 \times -100 = -\text{Rs.}125 \\ \text{Women} &= 1.10 (900-625) = 1.10 \times 275 = \text{Rs.} 302.50 \end{aligned}$$

$$\text{Total L.E.V} = \text{Rs.}177.50$$

4. Labour Mix Variance =

$$\left[\frac{\text{Total Time of Actual Lab. Mix} \times \text{Std. Cost of Rev. Std. Mix}}{\text{Total Time of Std. Lab. Mix}} - \text{Std. cost of Actual Lab. Mix} \right]$$

$$1,225/1400 \times 20 \times 25 \times 1.25 + 30 \times 30 \times 1.10 - (25 \times 24 \times 1.25 + 25 \times 25 \times 1.10)$$

$$= \left[\frac{1,225}{1400} \times (625+990) - 750+687.50 \right]$$

$$= \left[\frac{1,225}{1400} \times 1615 - 1,437.50 \right] = 1,413.12 - 1,437.50 = \text{Rs.}24.38 \text{ unfavourable.}$$

PROBLEM ON SALES VARIANCE

12. From the following particulars calculate all sales variances according to (A) Profit Method (B) Value Method

Product	Standard			Actual		
	Qty (Units)	Cost per unit(Rs.)	Price per unit	Qty (Units)	Cost per unit(Rs.)	Price per unit
X	3,000	10.00	12.00	3,200	10.50	13.00
Y	2,000	15.00	18.00	3,200	10.50	17.00

SOLUTION:

A) UNDER PROFIT METHOD:

$$1. \text{ Total Sales Margin Variance} = \text{Actual profit} - \text{standard profit} \\ = 12,800 - 12,000 = \text{Rs.}800$$

2. Sales Margin Variance due to Selling price =

$$\text{Actual Qty. of sales (Actual Sale price per unit- budget sales price per unit)}$$

$$X = 3,200 \times (13-12) = 3,200 \times 1 = \text{Rs.}3,200$$

$$Y = 1,600 \times (17-18) = 1,600 \times -1 = \underline{-Rs.1,600}$$

$$\text{TOTAL SMV} = \underline{Rs.1,600}$$

3. Sales Margin Variance due to Volume =

Std. profit per unit (Actual Qty. of Sales- Budgeted Qty. of sales)

$$X = 2 (3,200-3,000) = 2 \times 200 = Rs.400$$

$$Y = 3 (1,600-2,000) = 3 \times -400 = \underline{-Rs.1,200}$$

$$\text{TOTAL SMV} = \underline{-Rs.800}$$

4. Sales Margin Variance due to sales mix =

Std. profit per unit (Actual Qty. of Sales- Budgeted proportion for Actual sales)

$$X = 2 (3,200-2,880) = 2 \times 320 = Rs.640$$

$$Y = 3 (1,600-1,920) = 3 \times -320 = \underline{-Rs.960}$$

$$\text{TOTAL SMV} = \underline{-Rs.320}$$

5. Sales Margin Variance due to Sales Qty.=

Std. profit per unit (Std. proportion for Actual sales - Budgeted Qty. of sales)

$$X = 2 (2,880-3,000) = 2 \times -120 = -Rs.240$$

$$Y = 3 (1,920-2,000) = 3 \times -80 = \underline{-Rs.240}$$

$$\text{TOTAL SMV} = \underline{-Rs.480}$$

UNDER VALUE METHOD:

1. Sales Value Variance = Actual value of sales – Budgeted value of sales
= 68,800 – 72,000 = -Rs.3,200

2. Sales price variance = Actual Qty of sales (Actual price –Budgeted price)

$$X = 3,200 (13-12) = 3,200 \times 1 = Rs.3,200$$

$$Y = 1,600 (17-18) = 1,600 \times -1 = \underline{-Rs.1,600}$$

$$\text{Total} = \underline{Rs.1,600}$$

3. Sales Volume Variance = Std.Price (Actual Qty of sales – Budgeted Qty. of sales)

$$X = 12 (3,200 -3,000) = 12 \times 200 = Rs.2,400$$

$$Y = 18 (1,600 – 2,000) = 18 \times -400 = \underline{-Rs.7,200}$$

$$\text{Total} = \underline{-Rs.4,800}$$

4. Sales Mix Variance = Std. Value of Actual Mix – Std value of Revised Std. Mix
= 67,200 – 69,120 = -Rs.1,920

5. Sales Qty. Variance = Std. Selling Price – (Rev. sales Qty- Budgeted Qty. of sales)

$$X = 12 (2,880 – 3,000) = -Rs. 1,440$$

$$Y = 18 (1,920 – 2,000) = \underline{-Rs.1,440}$$

$$\text{Total} = \underline{-Rs.2,880}$$