Block-III

Foundations of Accounting and Finance

Management Accounting

Foundations of Accounting and Finance

Block

III

MANAGEMENT ACCOUNTING

UNIT 7

Basic Cost Terms and Concepts **1-41**

UNIT 8

Cost Analysis and Decision Making **42-95**

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BLOCK III MANAGEMENT ACCOUNTING

This block discusses the basic cost terms and concepts of Management Accounting and provides an insight in to the Cost Analysis and Decision Making. The block consists of two units.

Unit 7 Basic Cost Terms and Concepts outlines the cost concepts and various types of costs, cost units and cost centers. It also deals with the relation between the cost behavior and cost estimation and the preparation of cost sheet.

Unit 8 Cost Analysis and Decision Making outlines the costs involved in decision making and the use of techniques of marginal cost and differential cost analysis in various production decisions. It also deals with the major considerations for fixation of selling price, different methods of pricing and the channels of distribution in marketing decisions.

The block units have been revised with updated exhibits and addition to content where necessary.

Unit 7

Basic Cost Terms and Concepts

Structure

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7.1 Introduction

We were introduced to financial accounting, one of the branches of accounting, in the previous units. In this unit, we will look into another branch of accounting which is cost accounting. Cost accounting data, along with the data derived from financial statements is used by the management widely to arrive at decisions. Hence, in addition to the financial information, the management would also need information on cost data which is a crucial factor for decision-making. For example, a firm proposes to increase its output by 10%, is it reasonable to expect total cost to increase exactly by 10% or more or less than 10%? Such questions are concerned about cost concepts and basic cost behavior which can be available. Such cost data is available in the cost accounting records maintained by the business.

In this unit, we will discuss the meaning of the terms cost, cost accounting and cost accountancy, and provide an overview of the different types of costs and various methods of costing. An insight into the concepts of cost unit and cost center, and a discussion on the characteristics of cost information for financial reporting purposes is also undertaken. We shall also derive the relation between cost behaviour and cost estimation and learn the preparation of statement of cost or cost sheet.

7.2 Objectives

After reading through the unit, the student should be able to:

- Describe the meaning of cost, cost accounting and cost accountancy
- Explain different types of costs

- Differentiate between cost unit and cost center
- State the characteristics of cost information
- Identify the Costs for Financial Reporting Purposes
- Discuss the relation between cost behaviour and cost estimation; and
- Prepare a statement of cost or cost sheet from the given information

7.3 Types of Costs

It is very difficult to define the term 'cost'. Cost accountants, economists and others define the concept of 'cost' according to their needs. According to the Oxford Dictionary, cost means "the price paid for something".

The important definitions of costs are given below:

According to CIMA (Chartered Institute of Management Accountants), London cost is, "the amount of expenditure (actual or notional) incurred or attributable to a given thing".

According to the Committee on Cost Concepts and Standards of American Accounting Association, "Cost means economic sacrifice, measured in terms of standard monetary unit, incurred or potentially to be incurred, as a consequence of a business decision to achieve a specific objective".

According to ICAI (Institute of Chartered Accountants of India), the term cost can be used as a noun meaning the amount of expenditure (actual or notional) incurred on or attributable to a specific article ,product or activity. As a verb it is used to ascertain the cost of a specified thing or activity.

In order to understand the meaning of the term 'cost', it should be used with a modifier or an adjective according to the specific purpose of its use.

The terms Costing, Cost Accounting and Cost Accountancy need to be interpreted to understand the concept of 'Cost'

Concepts of Cost, Costing, Cost Accounting & Cost Accountancy

ICAI defines the terms as follows:

Cost is "the amount of expenditure (actual or notional) incurred or attributable to a given thing".

Costing is "the technique and process of ascertaining costs".

Cost Accounting is defined as the process of accounting for cost which begins with the recording of income and expenditure or the bases on which they are calculated and ends with the preparation of periodical statements and reports for ascertaining and controlling costs.

Cost Accountancy has been defined as "the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived there from for the purposes of managerial decision-making.

Objectives of Cost Accounting

The objectives of Cost Accounting are:

(i) Ascertainment of Cost
(ii) Determination of Selling Price
(iii) Ascertaining the profit of each activity
(iv) Cost Control and Cost Reduction
(v) Providing assistance to the management in decision-making

Cost Classification

Cost classification is the process of grouping costs according to their common characteristics. A suitable classification of costs is very helpful in identifying a given cost with cost centers or cost units. Costs may be classified according to their nature, i.e., material, labour and expenses and a number of other characteristics. Depending upon the purpose to be achieved and requirements of a particular concern, the same cost figures may be classified into different categories. Costs can be classified in the following ways:

- By Nature or Element or Analytical classification
- By Functions
- By Traceability
- By Variability
- By Controllability
- By Normality
- By Capital or Revenue or Financial Accounting Classification
- By Time
- By Identification as part of Inventory
- According to Planning and Control
- For Managerial Decisions
- Other Types of Costs

Each classification will be discussed in detail in the following paragraphs:

By Nature or Element or Analytical Classification

Under this classification, costs are divided into three categories i.e., Materials, Labour and Overheads. Each element can undergo further sub-classification: for example, material into raw material, components and spare parts, consumable stores, packing material, etc.

Materials

Materials are the principal substances that go into the production process and are transformed into finished goods. They are further classified as direct materials and indirect materials. Direct materials can be easily and directly identified and easily traced with the production of finished goods. The cost of

direct materials generally comprises the major cost of the finished product. All the other materials that go into the production of the finished goods are called indirect material costs. They generally form a part of the manufacturing overheads. For example, for a furniture manufacturer, teak wood is direct material which goes into manufacturing the furniture, while items like the nails, adhesive and other sundry materials can be treated as indirect materials.

Labour

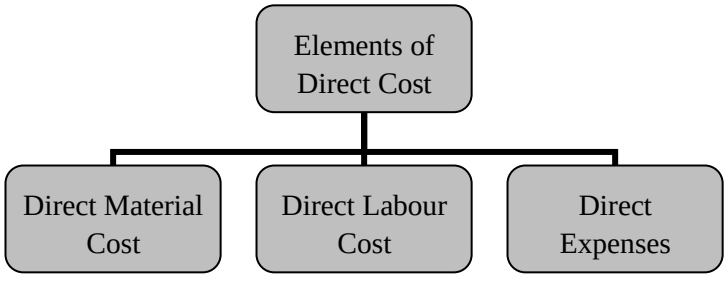
Labour is the human physical and mental effort that goes into the production of a product. It is further classified as direct and indirect labour. Direct labour is directly involved in the production of the product. Direct labour cost generally comprises major labour cost. The residual labour, which cannot be categorized as direct labour, is indirect labour. It forms a part of factory overheads. For example, continuing with the above example in a furniture manufacturing unit, the cost of the workers who directly expend their energy on the direct material with the help of tools and machines are considered as direct labour. The supervisor who is in charge of overseeing the work of say ten workers is considered as indirect labour.

Direct Expenses

According to Cost Accounting standard (CAS10) issued by Cost Accounting Standards Board of ICWAI, direct expenses are expenses relating to manufacture of a product or rendering a service, which can be identified or linked with the cost object other than direct material cost and direct employee cost.

The direct material cost along with the direct labour cost and any other direct expenses are together called as Direct Costs as shown in Figure 7.1.

Figure 7.1: Classification of Direct Costs



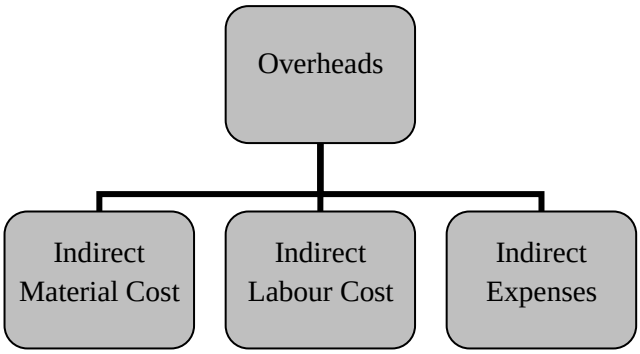
Source: ICFAI Research Center

Overheads

All other costs that are incurred by the company other than direct materials and direct labour are called overheads. Hence, overheads consist of indirect materials, indirect labour and other expenses (refer to figure 7.2). The overheads are further sub-divided into factory overheads, office and administrative overheads and selling and distribution overheads. Continuing with the above

example, factory lighting, rent of factory, rent of administrative building, wages of administrative staff, managers, depreciation of machinery etc., constitute overheads.

Figure 7.2: Classification of Overheads



Source: ICFAI Research Center

Indirect materials costs include costs incurred for tools, lubricants, etc. I**ndirect labour** includes plant maintenance and cleaning labour. **Indirect expenses** can be plant rent, plant insurance, property taxes on the plant, depreciation on plant and equipment, and remuneration to plant managers, advertising, etc.

By Functions

Under this classification, costs are grouped according to the broad divisions of functions of a business undertaking or basic managerial activities, i.e., production, administration, selling and distribution. According to this classification, costs are divided as follows:

Manufacturing and Production Costs

Production costs include the total of costs incurred in manufacture, construction and fabrication of units of production. The manufacturing and production costs comprise direct materials, direct labour and factory overheads.

Administrative Costs

Administrative cost includes costs incurred in planning, directing, controlling and operating a company. For example, salaries paid to managers and other administrative staff.

Selling and Distribution Costs

Selling costs and distribution costs are more often confused to be the same type of costs. However, there is a distinction between the two. Selling costs are defined as “the cost of seeking to create and stimulate demand and of securing orders”. Examples of selling costs are: advertisement, salesmen salaries etc. Distribution costs are defined as “the cost of sequence of operations which begin with making the packed product available for dispatch and ends with

making the reconditioned, returned empty packages, if any available for re-use". Examples of distribution costs are insurance on goods-in-transit, warehousing etc.

By Traceability

According to this classification, total cost is divided into direct costs and indirect costs. Direct costs are incurred for and may be conveniently identified or easily traceable with a particular cost center or cost unit. The common examples are materials used and labour employed in manufacturing an article or in a particular process of production. Indirect costs are incurred for the benefit of a number of cost centers or cost units and cannot be conveniently identified with a particular cost center or cost unit. Examples include rent of building, management salaries, machinery depreciation, etc.

The nature of the business and the cost unit chosen will determine the costs as direct and indirect. For example, the hire charges of a mobile crane used onsite by a contractor would be regarded as a direct cost since it is identifiable with the project/site on which it is employed, but if the crane is used as a part of the services of a factory, the hire charges would be regarded as indirect cost because they will probably benefit more than one cost center or department. The distinction between these two costs is essential because the direct costs of a product or activity can be accurately identified with the cost object while the indirect costs have to be apportioned on the basis of certain assumptions about their incidence.

By Variability

The basis for this classification is the behaviour of costs in relation to changes in the level of activity or volume of production. On this basis, costs are classified into three groups viz. fixed, variable and semi-variable. For a business organization, it is important to identify, track infer and allocate how the various costs change vis a vis volume at different output levels. The breakdown of these expenses determines the price level of the services and assists in many other aspects of the overall business strategy.

Fixed Costs

Fixed costs remain fixed in total with increase or decrease in the volume of output or activity for a given period of time or for a given range of output. Fixed costs per unit vary inversely with the volume of production, i.e., fixed cost per unit decreases as production increases and increases as production decreases. Examples are rent, insurance of factory building, factory manager's salary, etc. These costs are constant in total amount but fluctuate per unit as production level changes. They are also termed as capacity costs.

It is important to note that fixed costs are not constant in the long run. For example, rent will be the same till the business occupies the space or till the

landlord decides to increase the rent after the end of the lease agreement. If the owner decides to move to a bigger facility or pay more, the business expense would obviously go up.

It must be remembered that fixed costs remain constant only with in a particular range. Once that range is crossed the costs rise steeply and remain constant within the next range.

Variable Costs

Variable costs vary in total directly in proportion to the volume of output. These costs per unit remain relatively constant with changes in volume of production or activity. Thus, variable costs fluctuate in total amount but tend to remain constant per unit as production level changes. Examples are direct material costs, direct labour costs, power, repairs, etc.

We can apply the following formula for calculating total variable cost:

Total Variable Cost = Total Quantity of Output x Variable Cost Per Unit of Output

Semi-Variable Costs

Semi-variable costs are partly fixed and partly variable. In this type of cost, a base-level fixed cost will be always be incurred, irrespective of volume, as well as an additional variable cost based only on volume will be incurred. A factory may incur ₹ 10000 labor cost per day to maintain minimum level of production. But due to new order received, production volume is exceeding the minimal level and hence production staff work overtime. Thus, the basic ₹ 10,000 daily cost will be incurred at all volume levels, and is therefore the fixed element of the semi-variable cost, while overtime varies with production volume, and so is the variable element of the cost. For example, telephone expenses include a fixed portion of monthly charge plus variable charge according to the number of calls made; thus total telephone expenses are semi-variable. Other examples of such costs are: depreciation, repairs and maintenance of building and plant, etc. These are also called semi-fixed costs or mixed costs.

As the level of usage of a semi-variable cost item increases, the fixed component of the cost will not change, while the variable component will increase. The formula for this relationship is:

$Y = a + bx$

Y = Total cost

a = Total fixed cost

b = Variable cost per unit of activity

x = Number of units of activity

By Controllability

On the basis of controllability, costs are classified into two categories viz., controllable costs, and uncontrollable costs.

Controllable Costs

If the costs are influenced by the action of a specified member of an undertaking, that is to say, costs, which are at least partly within the control of management, they are called controllable costs. An organization is divided into a number of responsibility centers, and controllable costs incurred in a particular cost center can be influenced by the action of the manager responsible for the center. Generally speaking, all direct costs including direct material, direct labour and some of the overhead expenses are controllable by lower level of management.

Uncontrollable Costs

If the costs cannot be influenced by the action of a specified member of an undertaking, that is to say, costs which are not within the control of management are called uncontrollable costs. Most of the fixed costs are uncontrollable. For example, rent of the building is not controllable and so are managerial salaries. Overhead cost, which is incurred by one service section or department and is apportioned to another, which receives the service, is also not controllable by the latter.

Controllability of costs depends on the level of management (top, middle or lower) and the period of time (long-term or short-term).

By Normality

On the basis of normality, the costs are classified into two categories viz., normal cost, and abnormal cost.

Normal Cost

It is the cost which is normally incurred at a given level of output in conditions which are favourable for that level of output. Normal Costs are the normal or regular costs which are incurred in the normal conditions during the normal operations of the organization. They are the sum of actual direct materials cost, actual labour cost and other direct expense. Example: repairs, maintenance, salaries paid to employees. This cost forms the cost of production of a product.

Abnormal Cost

It is the cost, which is normally incurred at a given level of output in conditions which are not favourable for that level of output. It is not considered as a part of cost of production and charged to Costing Profit and Loss Account. Example: destruction due to fire, shut down of machinery, lock outs, etc.

By Capital and Revenue or Financial Accounting Classification

According to financial accounting terminology, costs are of two types viz., capital costs and revenue costs.

Capital Cost

If the cost is incurred in purchasing assets either to earn income or increase the earning capacity of the business, it is called capital cost. For example: the cost of a rolling machine in a steel plant. Though the cost is incurred at one point of time, the benefits accruing from it are spread over a number of accounting years.

Revenue Cost

Revenue expenditure is any expenditure incurred to maintain the earning capacity of the concern such as cost of maintaining an asset or running a business. For example, cost of materials used in production, labour charges paid to convert the material into production, salaries, depreciation, repairs and maintenance charges, selling and distribution charges, etc. While calculating revenue cost, only revenue items are considered whereas capital items are completely ignored.

By Time

Costs can be classified as (i) Historical costs, and (ii) Predetermined costs.

Historical Costs

The costs, which are ascertained after being incurred, are called historical costs. Such costs are available only when a particular item has already been produced. Such costs are only of historical value and not at all helpful for cost control purposes.

Predetermined Costs

Such costs are estimated costs, i.e., computed prior to production taking into consideration the previous periods' costs and the factors affecting such costs. If they are determined on scientific basis they become standard cost. Such costs when compared with actual costs will give the variances and reasons of variance and will help the management to fix the responsibility and to take remedial action to avoid its recurrence in future.

Historical costs and predetermined costs are not mutually exclusive. Even in a system when historical costs are used, predetermined costs have a very important role to play because a figure of historical cost by itself has no meaning unless it is related to some other standard figure to give meaningful information to the management.

By Identification as Part of Inventory

Costs on this basis are classified as product costs and period costs. This distinction is required for the purpose of profit determination. This is because product costs are carried forward to the next accounting period in the form of unsold finished stock, whereas period costs are written off in the accounting period in which they are incurred.

Product Cost

Product costs are associated with the unit of output. They are 'absorbed by' or 'attached to' the units produced. They go into the determination of inventory valuation (finished goods and partly completed goods) hence are also called inventoriable costs. They consist of direct materials, direct labour and factory overheads (partly or fully). The extent of inclusion of factory overheads depends on the type of costing system in force – absorption and direct costing. Where the absorption costing method is adopted, factory overheads both fixed and variable content are included as part of product cost. Where the direct costing method is adopted only variable factory overheads are included as part of inventoriable cost.

Period Costs

Period costs are costs associated with time period rather than the unit of output or manufacturing activity. These costs are not treated as part of inventory and hence are treated as expenses in the period in which they are incurred. Administrative, Selling and Distribution costs are treated as period costs and are deducted as an expense for the determination of income and are not regarded as a part of inventory cost.

According to Planning and Control

Cost accounting furnishes information to the management which is helpful in discharging the two important functions of management i.e., planning and control. For the purpose of planning and control, costs are classified as budgeted costs and standard costs.

Budgeted Costs

Budgeted costs represent an estimate of expenditure for different phases or segments of business operations, such as manufacturing, administration, sales, research and development, for a period of time in future which subsequently becomes the written expression of managerial targets to be achieved. Various budgets are prepared for different phases/segments of business, such as sales budget, raw material cost budget, labour cost budget, cost of production budget, manufacturing overhead budget, office and administration overhead budget etc. Continuous comparison of actual performance (i.e., actual cost) with that of the budgeted cost is made so as to report the variations from the budgeted cost to the management for corrective action.

Standard Costs

The Institute of Cost and Management Accountants, London defines standard cost as, "the predetermined cost based on a technical estimate for materials, labour and overhead for a selected period of time and for a prescribed set of working conditions". Thus, standard cost is a determination, in advance of production, of what should be its cost under a set of conditions.

Differences between Budgeted Costs and Standard Costs

Budgeted costs and standard costs are similar to each other to the extent that both of them represent estimates of cost for a period of time in future. In spite of this, they differ in the following respects:

- Standard costs are scientifically predetermined costs for every aspect of business activity whereas budgeted costs are mere estimates made on the basis of past actual financial accounting data adjusted to future trends. Thus, budgeted costs are projection of financial accounts whereas standard costs are projection of cost accounts.
- The term **standard cost** refers to a specific **cost** per unit. **Budgeted cost** refers to **costs in** total given a certain level **of** activity
- A standard costing system can operate without any comprehensive budgeting system. But budgets in absence of standard costs will only be fair estimates and cannot provide a reasonable base against which the actual results can be compared.
- Review and revision of budgets is more frequently based on the changing circumstances than those of standard costs. Standard costs are more static and subject to less change.
- The primary emphasis of budgeted costs is on the planning function of management whereas the main thrust of standard costs is on cost control.
- Budgeted costs are extensive whereas standard costs are intensive in their application. Budgeted costs represent a macro approach of business operations because they are estimated in respect of the operations of a department. Contrary to this, standard costs are concerned with cost controlling in the business operations of each department. Budgeted costs are calculated for different functions of the business, i.e., production, sales, purchases, etc., whereas standard costs are compiled for each element of cost, i.e., material, labour and overheads.

For Managerial Decisions

On this basis, costs may be classified into the following categories:

Marginal Cost

It is the additional cost incurred if an additional unit is produced. It is derived from the variable cost of production, given that fixed costs do not change as

output changes, hence no additional fixed cost is incurred in producing another unit of a good or service once production has already started. In other words, 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. Calculating the marginal cost helps a business determine the point at which increasing the number of items produced will push the average cost up.

Out-of-Pocket Costs

It is that portion of the cost which involves payment, i.e., gives rise to cash 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.

Differential Costs

If there is a change in costs due to change in the level of activity or pattern or method of production they are known as differential costs. If the change increases the cost, it will be called incremental cost and if the change results in the decrease in cost it is known as decremental cost.

The concept is used when there are multiple possible options to pursue, and a choice must be made to select one option and drop the others. The concept can be particularly useful in step costing situations, where producing one additional unit of output may require a substantial additional cost. Here are two examples:

Example of alternative decisions. If you have a decision to run a fully automated operation that produces 100,000 widgets per year at a cost of Rs1,200,000, or of using direct labor to manually produce the same number of widgets for Rs1,400,000, then the differential cost between the two alternatives is Rs200,000.

Example of change in output. A work center can produce 10,000 widgets for Rs29,000 or 15,000 widgets for Rs40,000. The differential cost of the additional 5,000 widgets is Rs11,000.

Sunk Costs

Sunk cost is another name for historical cost. It is a cost that has already been incurred and is irrelevant to the decision-making process. A good example is, depreciation on a fixed asset because the cost (of purchasing the asset) has already been incurred (when it was purchased) and it cannot be affected by any future action. Though we allocate the depreciation cost to future periods the original cost of the asset is unavoidable. What is relevant in this context is the salvage value of the asset, not the depreciation. Thus, sunk costs are not relevant for decision-making and are not affected by increase or decrease in volume.

Imputed (Or Notional) Costs

These costs appear in cost accounts only. For example: notional 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.

Opportunity Cost

It is the maximum possible alternative earnings that will be foregone if the productive capacity or services are put to some other use. For example, if an owned building is proposed to be used for a project, the likely rent of the building is the opportunity cost which should be taken into consideration while evaluating the profitability of the project. Since, opportunity costs are not the actual costs incurred but only the benefits foregone, they are not recorded in the accounting books. However, they are relevant costs for decision-making purposes and are considered while evaluating different alternatives.

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.

Avoidable and Unavoidable Costs

Avoidable costs can be eliminated if a particular product or department, with which they are directly related to, is discontinued. For example, salary of the clerks employed in a particular department can be eliminated, if the department is discontinued. Unavoidable cost 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 the production of a product is discontinued.

Other Types of Costs

Future Costs

These costs are expected to be incurred at a later date.

Programmed Costs

Certain decisions reflect the policies of the top management which result in periodic appropriations and are referred to as programmed costs. For example, the expenditure incurred by a company for employee training and development is a programmed cost which reflects the policy of the top management.

Joint Costs

It is the cost of manufacturing joint products up to or prior to the split-off point. Cost incurred after the split-off point is called separable cost. Joint cost is common to the processing of joint products and by-products till the point of separation and cannot be traced to a particular product before the point of split-off.

Conversion Costs

It is the cost incurred on converting the raw material into finished product. It can be calculated by deducting the cost of direct materials from the production cost or it is the sum of direct labour and factory overheads.

Discretionary Costs

These costs do not have any obvious relationship with the levels of capacity or output activity and are determined as a part of the periodic planning process. In each planning period, the management decides on how much to spend on certain discretionary items such as advertising, research and development, employee training. These costs are amenable to alteration by the management.

Committed Costs

It is a fixed cost, which results from the decisions of the management in the prior period and is not subject to the management control in the present on a short run basis. It arises from the possession of production facilities, equipment, organization set-up etc.

Some examples of committed costs are: plant and equipment depreciation, taxes, insurance premium and rent charges.

It is important to note that there are a variety of ways in which cost accounting information can be classified and there is no single best classification method. Classification depends on the purpose for which the information is to be used.

For example, costs may be classified for each of the three broad categories as shown in Table 7.1:

Table 7.1: Classification of Costs based on Cost Categories

Cost Categories	Possible Methods of Cost Classification
1. Costs for Stock Valuation	Period and Product Costs Elements of Manufacturing Costs Job and Process Costs
2. Costs for Decision-making	Cost Behaviour Relevant and Irrelevant Costs Avoidable and Unavoidable Costs Sunk Costs Opportunity Costs Marginal and Incremental Costs
3. Costs for Control	Controllable and Uncontrollable Costs Cost Behaviour

Source: ICFAI Research Center

Check Your Progress – 1

1. Which of the following is not a criterion for classification of cost?
   a. Time
   b. Identifiability
   c. Variability
   d. Nature of business
   e. Nature of element
2. Which of the following is not a functional classification of cost?
   a. Manufacturing costs
   b. Standard costs
   c. Selling costs
   d. Distribution costs
   e. Administration costs
3. Which of the following statements is not true with regard to budgeted costs and standard costs?
   a. Budgeted costs are expected costs
   b. Standard costs are desired costs
   c. Budgeted costs facilitate planning
   d. Standard costs facilitate control
   e. Standard costing is merely an arithmetic exercise
4. Sunk costs are
   a. Relevant in decision-making
   b. Cost of goods destroyed by flood
   c. Irrelevant in decision-making
   d. The same as imputed costs
   e. Those which change across alternatives
5. A cost which is normally incurred at a given level of output in conditions which are not favourable for that level of output is called:
   a. Normal Cost
   b. Abnormal Cost
   c. Marginal Cost
   d. Sunk Cost
   e. Avoidable Cost

Activity 7.1 Classify the following costs on the basis of functions: Excise Duty, Royalty, Hire of special equipment obtained for a contract, Cost of rectifying defective work, Insurance premium paid, Canteen and welfare expenses, Cost of training new employees.

7.3.1 Techniques of Costing

For ascertaining the cost, the following types of costing techniques are used. These techniques are:

- **Absorption Costing**: Under this type of costing, all costs, both variable and fixed are charged to operations, processes or products. This differs from marginal costing where fixed costs are excluded.
- **Direct Costing**: All direct costs are charged to operations, processes or products leaving all indirect costs to be written off against profits in which they arise.
- **Historical Costing:** It is the ascertainment of costs after they have been incurred. This type of costing has limited utility.
- **Marginal Costing**: It is defined as the ascertainment of marginal cost by differentiating between fixed and variable costs. It is used to ascertain effects of changes in volume of type of output on profit.
- **Standard Costing:** This is a technique of cost ascertainment and cost control. The standard costs are predetermined and subsequently compared with the recorded actual costs. This technique may be used in conjunction with any method of costing. Predominantly used in the manufacturing sector, wherein the production of standardized goods is a routine activity.

The techniques of costing help in cost analysis and are the basis for cost control and cost reduction. They help in decision-making.

7.3.2 Methods of Costing

The methods of costing are different kinds of accounting of cost data. It is industry and activity specific. Different industries use different methods of costing and hence the method of costing is derived from the nature of their work. Various methods are as under:

- **Batch Costing:** Each batch is treated as unit of cost and thus separately costed. The cost per unit is determined by dividing the cost of the batch by the number of units produced in the batch.

- **Contract Costing**: The cost of each contract is ascertained separately. This is suitable for enterprises engaged in construction activity especially Roads, Highways, Bridges, Dams etc.
- **Job Costing**: Each job is considered as an independent task. Hence, the cost of each batch with certain specifications is manufactured in units and the costing is for the said job.
- **Multiple Costing**: It is combination of two or more methods being used. Eg: Manufacturing of parts of cycle are accounted using Job Costing and the assembling task is accounted by Single/ Output Costing method.
- **Operating Costing**: This method is used by enterprises engaged in rendering services such as transport, supply of water, electricity, retail trade etc.
- **Process Costing**: This method is used in mechanical operations, wherein, the cost of each operation/ process may be accounted separately.
- **Single/Output Costing**: This method of costing is used wherein, the product being manufactured is only one single product. Eg: Bricks.

7.4 Cost Units and Cost Centers

Once the various types of costs that appear in an organization are identified and classified, the next step would be assign the costs. Costs are usually identified and assigned based on a unit of product, service or time. Such a unit of product, service, activity etc is termed as cost unit. Costs are also accumulated on the basis of their place of occurrence into cost centers. Understanding the concept of cost units and cost center not only helps in identifying costs but also in their control.

Cost Units

Managers are often interested in knowing the cost of something. The 'something' for which the cost has to be ascertained is known as cost objective or cost object or cost unit. Examples of cost units include, products, activities, departments, number of patients treated, sales regions, etc.

For example, if a factory produces motor cars then the cost unit would be a motor car because the costs are all incurred in producing motor cars.

Let us take up a more complex situation. Consider a bus operator providing bus services to the public between most of the major cities of the country. Suppose the bus operator wants to fix a cost unit, what would it be?

Note that here there is no production, what is provided is a service.

Each trip between two cities may be taken as a cost unit. Alternatively cost per kilometer of travel may be taken as a cost unit. However, neither of the above cost units relate to the passenger who buys the service.

If the operator wants to fix a price to be charged to each passenger, the above cost units would have to be adjusted further.

Assume that a bus covers a distance of 700 km per day carrying 30 passengers on an average. The output is 700 x 30 = 21,000 passenger kilometers per day. On an average the passenger kilometers covered by each bus per week is 1,00,000. The total cost of operation per bus per week is ₹ 80,000, and the cost per passenger kilometer is = ₹ 0.80

$$\text{Cost per passenger kilometer} = \frac{₹\ 80,000}{1,00,000\ \text{km.}} = ₹\ 0.80$$

The implication is that the bus operator must charge, on an average, over ₹ 0.80 per kilometer to each passenger in order to make a profit.

Exhibit 7.1 discusses the difference between cost object and cost unit.

Exhibit 7.1: Cost Object vs. Cost Unit

Most often the terms cost object and cost unit are used interchangeably. A cost object is any activity for which a separate measurement of costs is desired. The cost of rendering service to a bank customer or a patient or the costs of a product are a few such examples. Few accountants however, prefer to treat cost object as a broader concept and cost unit as lower level concept. A cost unit is a quantitative unit of product or service for which costs are ascertained. For example, in an university, the cost of educating a student is treated as a cost object and the cost unit can be the cost per student, or cost per student per program etc.

Source: ICFAI Research Center

Cost Centers

The smallest segment of activity or area of responsibility for which costs are accumulated is designated as a cost center. In the manufacture and sale of a product or in the rendering of a service, several activities may have to be performed. These activities are usually carried out by different departments or sections of the company. For example, in a pharmaceutical company, the raw materials may be purchased by a purchase department, stocked up in a store, processed in one or more processing departments, packed in a packing department and sold by a sales and distribution department. Hence, cost statistics are conveniently accumulated for each department. In Cost Accounting each department would be called a Cost Center. Typically cost centers are departments, but in some instances, a department may contain several cost centers. For example, a machine department may be under one foreman but it may contain various groups of machines, such as lathes, milling machines, etc.

As each department is managed by a departmental manager, the cost of a department would be a measure of how the department's manager is performing. In fact, by reporting departmental costs to the concerned managers, they will better understand the cost consequences of their actions so that departmental performance becomes more cost effective.

Exhibit 7.2 gives an example of Amazon Web Services, a cloud based platform that helps organizations with easier cost center creation and monitoring.

Exhibit 7.2: Cost Center Categorization using Amazon Web Services

Amazon Web Services (AWS) is a cloud based platform that offers a range of cloud based web services. One of the services it offers is cost management solutions. The cost management solutions of AWS include deriving cost and usage data reports, customizing cost budgets to track your costs and usage, cost anomaly detection and cost categorization.

The cost categorization feature enables grouping of costs into meaningful categories and centers. This grouping is mapped with the internal organization structure and given a name such as Cost center 1, 2 etc. The cost and usage report that is generated on a monthly basis reports the data based on these cost centers. There are several other features such as splitting the costs between the centers which are shown as "shared costs", defining rules for each cost center or group, creating multilevel hierarchies etc.

The major advantage of such grouping is that costs can traced to these centers easily and also helps in anomaly detection

Source: https://aws.amazon.com/aws-cost-management/aws-cost-categories/, 2021

7.5 Characteristics of Cost Information

Cost accounting provides information that helps in planning, controlling and decision-making.

- Planning is future-oriented. Hence, cost information generated from historical records has to be attuned to future changes in the organization and its environment.
- Analysis and comparison of the actual and expected results indicate whether there is any need for control. Hence, costs have to be broken down into various elements and each element of cost has to be compared with a "norm" or "standard".
- Decision-making is a future oriented activity because the impact of current decisions is experienced in terms of future costs and benefits. Decision-making considers only relevant costs. A cost that remains the same regardless of the alternative chosen is not a relevant cost. But a cost that changes depending upon the alternative chosen is a relevant cost.
- Cost data is gathered from the information about the operations to determine the costs, which are related to each cost center. The financial accounting system provides the data on expenses, and these are now treated as costs.
- General or common costs like depreciation on factory building have to be distributed among the various cost centers on an equitable basis.
- The costs accumulated in each cost center are then "loaded" or distributed over the cost units produced by them.

7.5.1 Cost Tracing

Tracing of costs is an attempt to assign costs on the basis of their cause. The cost which can be traced directly to a specific cost objective is direct cost with respect to that cost objective and the cost which cannot be traced directly to a specific cost objective is indirect cost with respect to that cost objective. Tracing of costs is essential for two primary reasons: cost control and product costing.

7.5.2 Cost Allocation

Many costs are incurred in an organization as a result of activities performed in several responsibility centers or subunits of the organization. A collection of costs to be assigned to different subunits is called a cost pool. The responsibility centers, products or services to which costs are to be assigned are called cost objects. The process of assigning the costs in the cost pool to the cost objects is called cost allocation or cost distribution.

7.5.3 Cost Driver

A cost driver is an output measure that causes costs. For this reason it is necessary for an organization or its subunit to find out its activities and determine measures of output for each of the activities identified. Once an output measure for each of the activities is determined, it is possible to relate each output measure to the resources that are necessary to produce it.

Examples of output measures include number of letters dispatched by a dispatch clerk, passenger kilometers operated by a transport company, tonnes of coal produced by a coal mining company, meals served by a hotelier etc.

7.6 Costs for Financial Reporting Purposes

Generally Accepted Accounting Principles (GAAP) determines how costs are to be classified for financial reporting. The financial statements are for users outside the organization and the rules underlying the classification of costs for reporting in financial statements are not likely to be used for internal decision-making. The main problem in financial reporting is determining when costs become expensed in the income statement. The calculation of the cost of a product for planning and cost control purposes may be different from the calculation of the cost of a product for financial reporting purposes.

Product costs are identified with goods manufactured or purchased for resale. Product costs on financial statements include all manufacturing costs, i.e., direct material, direct labour and overheads. Period costs are identified with a time period rather than a product – selling, administration and interest costs are treated as period costs for presenting in financial statements.

When costs are being used as part of financial accounting, they are to be audited. This led to the concept of cost audit.

7.6.1 Concept of Cost Audit

"Cost Audit" is defined by the Institute of Cost and Management Accountants of England as "the verification of cost accounts and a check on the adherence to the Cost Accounting Plan."

Cost Audit, apart from having all the normal ingredients of audit, i.e., vouching, verification etc., has within its domain elements of efficiency audit and propriety audit as well.

i. **Efficiency Audit:** It is directed towards the measurement if whether corporate plans have been effectively executed.

ii. **Propriety Audit:** It is concerned with the executive actions and plans bearing on the finances and expenditure of the company.

7.6.2 Purposes of Cost Audit

a. **Protective purpose of Cost Audit:** To examine that there is no undue wastage or losses and the costing system brings out the correct and realistic cost of production or processing.

b. **Constructive purpose of Cost Audit:** Useful in regulating Production, choosing economical methods of operation, reducing operation costs etc.

Types of Cost Audit:

a. Cost Audit on behalf of the management
b. Cost Audit on behalf of the customer
c. Cost Audit on behalf of the government
d. Cost Audit by trade associations
e. Statutory Cost Audit

7.7 Cost Behaviour and Cost Estimation

Understanding an organization's cost behaviour enables managers to anticipate changes in cost when the organization's level of activity changes. Cost predictions, which are based on cost behaviour patterns, facilitate planning, control, and decision-making throughout the organization. These cost predictions are valid for a range of activities known as relevant range. Relevant range is the range of activity for which the fixed costs remain the same.

A variety of cost behaviour patterns exist, ranging from simple variable and fixed costs to more complicated semi-variable and curvilinear costs. Several cost estimation methods are used to determine which cost behaviour pattern is appropriate for a particular cost.

As in selecting any managerial accounting technique, the choice of a cost estimation method involves a trade-off of costs and benefits. More accurate estimation methods provide the benefits of better information, but they are often more costly to apply.

7.8 Statement of Cost or Cost Sheet

The companies which have their production or manufacturing units along with office premises and also carry out sales and distribution of goods, require a systematic cost accounting procedure to determine the cost, profit and sales price. They prepare Cost sheet. Cost Sheet is a statement, which provides for assembly and depiction of the detailed cost in respect of cost centers and cost units. Data is collected from various sources to incorporate in the cost sheet. Cost sheet is only a statement. It is not a part of double entry cost accounting records. The cost sheet of a business organization provides an insight into its performance and efficiency. It helps in competitive analysis and improvement of the business operations through cost reduction.

According to ICMA, London, 'the cost sheet is a statement which provides for the assembly of the detailed cost of a cost center or a cost unit'.

There is no specific format for preparing a cost sheet. Generally, it is presented in a columnar form as shown in Table 7.2 below. The columns are for the total cost and per unit cost of current period and previous period. Sometimes budgeted total cost and per unit column are also incorporated in cost sheet. If the cost sheet is presented in the ledger account format, then it is called 'Production Account'.

Table 7.2: Proforma of Cost Sheet

Particulars	Total Cost (₹)	Cost per unit (₹)
Direct Materials Direct Labour Direct Expenses		
Prime Cost Add: Works Overheads		
Works Cost Add: Administration Overheads		
Cost of Production Add: Selling and Distribution Overheads		
Total Cost or Cost of Sales Profit		
Sales		

Treatment of Stock

Stock may be raw material, work-in-progress and finished goods. These are to be adjusted in the cost sheet.

Stock of Raw Materials

If the opening, closing and purchase of raw materials are given, then the material consumed can be determined in the following way:

Particulars	₹
Opening Stock of Raw Materials	xxx
Add: Purchases of Raw Materials	xxx
	xxx
Less: Closing Stock of Raw Materials	xxx
Cost of Raw Material Consumed	xxx

Stock of Work-in-Progress

Semi-finished or uncompleted units are known as work-in-progress. Generally, it is valued at works cost. Opening and Closing stock of work-in-progress is adjusted in the following way:

Particulars	₹
Prime Cost	xxx
Add: Factory Overheads	xxx
	xxx
Add: Opening Stock of Work-in-Progress	xxx
	xxx
Less: Closing Stock of Work-in-Progress	xxx
Factory or Manufacturing or Works Cost	xxx

Stock of Finished Goods

Opening and closing stock of finished goods are adjusted in the following way before calculating the cost of goods sold:

Particulars	₹
Works Cost	xxx
Add: Administration Overheads	xxx
Cost of Production	xxx
Add: Opening Stock of Finished Goods	xxx
	xxx
Less: Closing Stock of Finished Goods	xxx
Cost of Goods Sold	xxx

Treatment of Scrap

As per Cost Accounting standard (CAS 24) issued by Cost Accounting standard board India the word scrap is defined as discarded material having no or insignificant value and which is usually either disposed off without further treatment (other than reclamation and handling) or reintroduced into the process in place of raw material. Scrap may be defined as an unavoidable residue material arising in certain types of manufacturing processes. Generally, it has small realizable value. It is deducted either from factory overheads, or factory cost while preparing cost sheet.

Items Excluded from Cost

The following items are not included while preparing a cost sheet:

a. Interest Paid
b. Dividends Paid
c. Transfer to Reserves
d. Donations Paid
e. Preliminary Expenses Written Off
f. Goodwill Written Off
g. Cash Discount Paid
h. Provision for Taxation
i. Provision for Income Tax
j. Profit/loss on Sale of Fixed Assets etc.

The proforma of the **Comprehensive Cost Sheet,** i.e., with stocks, is shown under Exhibit 7.3:

Exhibit 7.3: Proforma of Comprehensive Cost Sheet

	Opening Stock Raw Materials
Add:	Purchases (including Carriage Inwards, Transit Insurance etc.)
Less:	Closing Stock of Raw Materials
	Direct Materials Consumed
Add:	Direct Labour
	Direct Expenses
	Prime Cost
Add:	Factory Overheads (Works OH / Manufacturing OH / Production OH)
Add:	Opening Stock of Work in Progress
Less:	Closing Stock of Work in Progress
	Factory Cost / Work Cost
Add:	Administration Overheads
	Cost of Production
Add:	Opening Stock of Finished Goods
Less:	Closing Stock of Finished Goods
	Cost of Goods Sold
Add:	Selling and Distribution Overheads
	Cost of Sales
Add:	Profit/Loss (Balancing Figure)
	Sales

Source: Adapted from Ravi M .Kishore, "Cost & Management Accounting", Taxmann Publications 2018 edition

Illustration 7.1

Following information has been obtained from the records of a manufacturing company:

Particulars	1-1-20xx	31-12-20 xx
	₹	₹
Stock of Raw Materials	50,000	60,000
Stock of Finished Goods	1,00,000	1,50,000
Stock of Work-in-Progress	13,000	16,000

Transactions during the year:

Particulars	₹	Particulars	₹
Indirect Labour	60,000	Carriage Outward	20,000
Lubricants	12,000	Power	20,000
Insurance on Plant	4,000	Direct Labour	2,00,000
Purchase of Raw Materials	3,00,000	Depreciation on Machinery	40,000
Sales Commission	72,000	Factory Rent	50,000
Salaries of Salesmen	90,000	Property Tax on Factory Building	14,000
Administration Expenses	1,50,000	Sales	10,11,000

Prepare a statement of cost and profit showing: (a) Cost of Raw Materials Consumed, (b) Prime Cost (c) Total Manufacturing Cost, (d) Factory Manufacturing Cost, (e) Cost of Production, (f) Cost of Goods Sold, (g) Cost of Sales, and (h) Profit.

Solution

Statement of Cost and Profit for the year ended 31-12-20xx

Particulars	₹	₹
Opening Stock of Raw Materials	50,000	
Add: Purchase of Raw Materials	3,00,000	
	3,50,000	
Less: Closing Stock of Raw Materials	60,000	
Cost of Raw Materials Consumed		2,90,000
Direct Labour		2,00,000
Prime Cost		4,90,000
Factory Overheads: (Assuming all are Indirect Expenses)		
– Indirect Labour	60,000	
– Lubricants	12,000	
– Insurance on Plant	4,000	

Particulars	₹	₹
– Power	20,000	
– Depreciation on Machinery	40,000	
– Factory Rent	50,000	
– Property Tax on Factory Building	14,000	2,00,000
		6,90,000
Add: Opening Work-in-Progress		13,000
		7,03,000
Less: Closing Work-in-Progress		16,000
Factory (Manufacturing) Cost		6,87,000
Add: Administration Expenses		1,50,000
Cost of Production		8,37,000
Add: Opening Stock of Finished Goods		1,00,000
Cost of Goods Available for Sale		9,37,000
Less: Closing Stock of Finished Goods		1,50,000
Cost of Goods Sold		7,87,000
Sales Commission	72,000	
Salaries of Salesmen	90,000	
Carriage Outward	20,000	1,82,000
Cost of Sales		9,69,000
Profit		42,000
Sales		10,11,000

Illustration 7.2

The following particulars are extracted from the books of a company relating to commodity Alpha for the half-year ending 30th June 20xx.

Particulars	₹
Purchase of raw materials	1, 30,000
Direct wages	1,00,000
Rent, rates, insurance and works on cost	45,000
Carriage inwards	1,500
Stock on 1-1-20xx	
Raw materials	20,000
Finished products (1,600 tonnes)	17,600
Stock on 30-6-20xx	
Raw materials	25,000
Finished products (3,200 tonnes)	37,600
Work-in-progress on 1-1-20xx	4,500
Work-in-progress on 30-6-20xx	16,000
Factory supervision	10,000
Sales	3,00,000

Advertising discount allowed and selling cost is at ₹.0.50 per tonne sold. 25,000 tonnes of commodity was sold during the period.

You are required to ascertain:

i. Prime Cost

ii. Factory Cost

iii. Cost of Sales

iv. Profit

v. No. of tonnes of the commodity produced

Solution

Cost Sheet of Commodity Alpha for the Period Ending 30-6-20xx

Particulars	₹	₹
Raw materials:		
Opening stock	20,000	
Add: Purchases	1,30,000	
	1,50,000	
Less: Closing stock	25,000	
	1,25,000	
Add: Carriage inwards	1,500	
Material consumed		1,26,500
Direct wages		1,00,000
Prime cost		2,26,500
Rent, rates, insurance and works on cost (Assumed Indirect)	45,000	
Factory supervision	10,000	55,000
Add: Opening Work-in-progress		4,500
		2,86,000
Less: Closing Work-in-progress		16,000
Factory Cost		2,70,000
Add: Opening stock of finished goods (1,600 tonnes)		17,600
		2,87,600
Less: Closing stock of finished goods (3,200 tonnes)		37,600
Cost of goods sold		2,50,000
Add: Advertising and selling cost @ Re.0.50 per ……tonnes on 25,000 tonnes		12,500
Cost of sales		2,62,500
Profit		37,500
Sales		3,00,000

Statement showing the goods produced during the period:

Particulars	Tonnes
Goods sold	25,000
Add: Closing stock of finished goods	3,200
	28,200
Less: Opening stock of finished goods	1,600
Goods produced	26,600

Illustration 7.3

The books and records of the Sony Manufacturing Company present the following data for the month of August, 20xx:

Direct labour cost	₹ 25,000 (165% of factory overhead)
Cost of goods sold	₹ 76,000

Inventory accounts showed these opening and closing balances:

(Amount in ₹*)*

Particulars	August 1st	August 31st
Raw materials	12,000	12,600
Work-in-progress	11,000	16,000
Finished goods	17,000	21,000

Other data:

(Amount in ₹*)*

Particulars	₹
Selling expenses	3,400
General and administration expenses	4,600
Sales for the month	1,50,000

You are required to prepare statement showing cost of goods manufactured and sold and profit earned.

Solution

Statement of Cost and Profit

Particulars	₹
Opening Stock of Raw Materials	12,000
Add: Purchase of Raw Materials	40,849
	52,849
Less: Closing Stock of Raw Materials	12,600

Contd. ...

Materials Consumed	40,249
Direct Labour Cost	25,000
Prime Cost	65,249
Factory Overheads ($\left(\frac{100}{165}\right.$ x Rs.$25,000\left.\right)$	15,151
	80,400
Add: Work-in-progress	11,000
	91,400
Less: Work-in-progress	16,000
Works Cost	75,400
Add: General and Administration Expenses	4,600
Cost of Goods Manufactured	80,000
Add: Opening Stock of Finished Goods	17,000
	97,000
Less: Closing stock of Finished Goods	21,000
Cost of Goods Sold	76,000
Add: Selling Expenses	3,400
Cost of Sales	79,400
Profit	70,600
Sales	1,50,000

Note:

Calculation of Purchase of Raw Material

Particulars	₹
Cost of Goods Sold	76,000
Add: Closing Stock of Finished Goods	21,000
	97,000
Less: Beginning Stock of Finished Goods	17,000
Cost of Production	80,000
Less: General and Administration Expenses	4,600
Works Cost	75,400
Add: Work-in-progress (closing)	16,000
	91,400
Less: Work-in-progress (beginning)	11,000
	80,400
Less: Factory Overheads	15,151

Prime Cost	65,249
Less: Direct Labour	25,000
Materials Consumed	40,249
Add: Closing Stock of Raw Materials	12,600
	52,849
Less: Beginning Stock of Raw Materials	12,000
Purchase of Raw Materials	40,849

Production Account

If the cost elements in the cost sheet are shown in the form of ledger account it is called Production Account. All expenses are shown on the debit side of this account and closing stock and sales are shown on the credit side. Sometimes the closing stock may be deducted from the debit side.

Generally, production account is the combination of cost sheet, trading account and profit and loss account. It consists of four parts. First part gives the prime cost; the second part gives the cost of goods manufactured, third is gross profit and fourth will be net profit. The specimen of production account is given below in Table 7.3:

Table 7.3: Proforma of Production Account

Dr. **Production Account** Cr.

Particulars	₹	Particulars	₹
To Opening Stock of Raw Materials	xxx	By Closing Stock of Raw Materials	xxx
To Direct Materials	xxx	By Prime Cost c/d (Balancing figure)	xxx
To Direct Labour	xxx		
To Direct Expenses	xxx		
To Prime Cost b/d	xxx	By Closing Stock of Work-in-Progress	xxx
To Works Overhead	xxx	By Sale of By-products of Scrap	xxx
To Opening Work-in-progress	xxx	By Cost of Goods Manufactured c/d (Balancing figure)	
To Cost of Goods Manufactured b/d	xxx	By Sales	xxx
To Opening Stock of finished goods	xxx	By Closing Stock of Finished Goods	xxx
To Gross Profit c/d (Balancing figure)	xxx		
To Administration	xxx	By Gross Profit b/d	xxx

Particulars	₹	Particulars	₹
Overheads			
To Selling and Distribution Overheads	xxx		
To Net Profit (Balancing figure)	xxx		

Illustration 7.4

Prepare Production Account from the following particulars as on 31.1.20xx

Particulars	Opening (₹)	Closing (₹)
Stock of Raw Materials	75,000	91,500
Stock of Finished Goods	54,000	31,000
Stock Work-in-Progress	28,000	35,000

Particulars	₹	Particulars	₹
Purchase of Materials	66,000	Sundry Factory Expenses	10,000
Direct Wages	52,500	Office Rent and Rates	9,000
Indirect Wages	2,750	Other Administration Expenses	1,500
Factory Rent, etc.	15,000	Sales Expenses	12,500
Depreciation on Machine	3,500	Sales	2,11,000

Solution

Dr. **Production Account** Cr.

Particulars	₹	Particulars	₹
To Opening Stock of Raw Materials	75,000	By Closing Stock of Raw Materials	91,500
To Direct Materials Purchased	66,000	By Prime Cost C/d (Balancing figure)	1,02,000
To Direct Labour	52,500		
	1,93,500		1,93,500
To Prime Cost b/d	1,02,000	By Closing Stock of Work-in-Progress	35,000
To Works Overhead – Indirect Wages	2,750	By Cost of Goods Manufactured c/d (Balancing figure)	1,26,250

Particulars	₹	Particulars	₹
– Factory Rent, etc.	15,000		
– Depreciation on Machine	3,500		
– Other Factory expenses	10,000		
To Opening Work-in-Progress	28,000		
	1,61,250		1,61,250
To Cost of Goods Manufactured b/d	1,26,250	By Sales	2,11,000
To Opening Stock of Finished Goods	54,000	By Closing Stock of Finished Goods	31,000
To Gross Profit c/d (Balancing figure)	61,750		
	2,42,000		2,42,000
To Administration Overheads		By Gross Profit b/d	61,750
– Office Rent and Rates	9,000		
– Other Administration	1,500		
To Selling and Distribution Overheads	12,500		
To Net Profit (Balancing figure)	38,750		
	61,750		61,750

Tenders or Quotations

Very often management is required to quote the prices of its products in advance or has to submit tenders for goods to be supplied. A tender has to be prepared very carefully as the receipt of orders depends upon the price quoted. The preparation of tender requires information about the prime cost, overheads and the profit of the previous periods. After collecting the information, a tender is prepared on the basis of previous costs taking into account the present conditions and anticipated changes in the future price level. Overheads are to be absorbed based on the suitable overhead absorption method. After taking into account the marketable conditions, a reasonable profit is to be added to the cost. Finally, quotation price is to be determined.

Illustration 7.5

From the following particulars you are required to prepare a statement showing (a) The cost of materials consumed (b) Prime cost (c) Works cost (d) Total cost

(e) The percentage of works overheads to productive wages and (f) The percentage of general overheads to works cost:

Particulars	₹	Particulars	₹
Stock of finished goods on 1-1-20xx	1,27,400	Stock of finished goods on 31-12-20xx	1,36,500
Stock of raw materials on 1-1-20xx	58,240	Stock of raw materials on 31-12-20xx	61,880
Purchase of raw materials	13,28,600	Works overhead charges	2,26,135
Sale of finished goods	26,93,600	Office and general expenses	1,22,782
Productive wages	9,04,540		

The company is about to send a tender for a large plant. The costing department estimated that the materials required would cost ₹ 91,000 and the wages to workmen for constructing the plant would cost ₹ 54,600. The tender is to be made at a net profit of 20% on the selling price. Show what the amount of tender would be if based on the above percentages.

Solution

Statement of Cost

Particulars		₹
Raw materials (opening stock)		58,240
Add: Purchase of raw materials		13,28,600
		13,86,840
Less: Raw materials (closing stock)		61,880
a.	Materials consumed	13,24,960
	Productive wages	9,04,540
b.	Prime Cost	22,29,500
	Works overhead charges	2,26,135
c.	Works cost	24,55,635
	Office and general expenses	1,22,782
d.	Cost of Production or Total Cost	25,78,417

e. Percentage of works overhead charges to Productive wages

= (₹ 2,26,135/₹ 9,04,540) × 100 = 25%

f. Percentage of office and general expenses to Works cost

= (₹ 1,22,782/₹ 24,55,635) × 100 = 5%.

Tender for a Large Plant

Particulars	₹
Raw materials	91,000
Wages	54,600
Prime cost	1,45,600
Works overheads (25% of wages)	13,650
Works cost	1,59,250
Office and general expenses (5% of works cost)	7,963
Cost of production	1,67,213
Profit (1/4 of cost of production)	41,803
Tender price	2,09,016

Illustration 7.6

On 15th August 20xx, the Steadfast cycle manufacturing company, was required to quote for a contract for the supply of 500 bicycles. From the following details, prepare a statement showing the price to be quoted to give the same percentage of net profit on turnover as was realized during the six months to 30th June 20xx.

Particulars	₹	Particulars	₹
Stock of materials on 1st January, 20xx	1,00,000	Indirect charges during 6 months to 30th June, 20xx	50,000
Stock of materials on 30th June, 20xx	14,000	Completed stock-in-hand on 1st January, 20xx	Nil
Purchase of materials during 6 months to 30th June, 20xx	1,50,000	Completed stock-in-hand on 30th June, 20xx	1,00,000
Direct wages for 6 months to 30th June 20xx	3,00,000		

The number of bicycles manufactured during the six months was 2,000 including those sold and those in stock at the end of the period. The cycles to be quoted for are to be of uniform size and quality and similar to those manufactured during the six months to 30th June 20xx. Since 1st August, the cost of factory labour increased by 10% and that of materials by 15%. Sales during six months to 30th June, 20xx were ₹ 5,40,000.

Solution

Statement of Cost for the Half-Year ended 30th June, 20xx

Particulars	₹	Total (₹)	Per cycle (₹)
Opening stock of material	1,00,000		
Add: Purchase of material	1,50,000		
	2,50,000		
Less: Closing stock of material	14,000		
Material used		2,36,000	118.00
Direct wages		3,00,000	150.00
Prime cost		5,36,000	268.00
Indirect charges		50,000	25.00
Cost of production		5,86,000	293.00
Less: Completed stock in hand on 30-6-20xx		1,00,000	
Cost of goods sold		4,86,000	
Profit (10% on sales)		54,000	
Sales		5,40,000	

Percentage of indirect charges on direct wages

= (₹.50,000/₹.3,00,000) × 100 = 16.67%

Statement of Cost for Tender of 500 Cycles

Particulars	Per unit (₹)	Total (₹)
Material (₹118 + 15% of 118)	135.70	67,850
Direct wages (₹ 150 + 10% of 150)	165.00	82,500
Prime cost	300.70	1,50,350
Indirect charges (1/6 of wages)	27.50	13,750
Cost of production	328.20	1,64,100
Profit (10% of sales or 1/9 of cost of production)	36.47	18,233
Amount of Tender	364.67	182,333

Check Your Progress – 2

6. Cost centers are centers
   a. Where business decisions are taken
   b. Where board meets
   c. Where revenue is earned
   d. Where costs are incurred
   e. Where costs are allocated

7. Which of the following item of expenditure is not included while preparing a cost sheet?
   a. Administration expense
   b. Materials consumed
   c. Labour cost
   d. Dividends paid
   e. Works overheads
8. A quotation of cost prepared for an activity to be taken up in future is called
   a. Tender
   b. Production Account
   c. Cost Sheet
   d. Cost Unit
   e. Statement of Cost and Profit
9. Tracing of costs is an attempt to assign costs on the basis of their cause. For which two reasons is cost tracing undertaken?
   a. Cost planning and Cost control
   b. Cost control and Product costing
   c. Cost planning and Cost allocation
   d. Cost allocation and identification of cost drivers
   e. Product costing and identification of cost drivers
10. Which formula, among the following given options, can be used to arrive at factory cost?
    a. Prime Cost + Factory Overheads
    b. Direct materials + Direct wages
    c. Prime Cost + Factory Overheads + Opening stock of work in progress – closing stock of work in progress
    d. Factory Overheads + works cost
    e. Works cost + Administration overheads

Activity 7.2

a. Give examples of items that are excluded from cost while preparing the cost sheet.

b. Calculate the works cost, if the prime cost is ₹ 1,00,000, factory overhead is ₹ 20,000, closing work in progress is ₹ 30,000, and opening work in progress is ₹ 50,000.

7.9 Summary

- A cost unit is a quantitative unit of product or service for which costs are ascertained. Cost center is the smallest segment of activity or area of responsibility for which costs are accumulated.
- A collection of costs to be assigned to different subunits is called a cost pool. The responsibility centers, products or services to which costs are to be assigned are called cost objects. The process of assigning the costs in the cost pool to the cost objects is called cost allocation or cost distribution.
- Costing Accounting is the classification, recording and appropriate allocation of expenditure for the determination of the costs of products or services, and for the presentation of suitably arranged data for purposes of control and guidance of management.
- Cost Accountancy is the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. In order to ascertain the cost, a cost sheet is prepared periodically. It is a document, which provides for the assembly of the detailed cost of a cost center or cost unit. There is no specific format for preparing a cost sheet. Generally, it is presented in a columnar form. If it is prepared in the form of ledger account, it is called Production Account.
- Very often management is required to quote the prices of its products in advance or has to submit tenders for goods to be supplied. Such a statement is called a tender or quotation.

7.10 Glossary

Abnormal Cost is the cost that is not warranted under normal, external and internal conditions.

Absorption Costing is the technique of costing in which all direct costs and manufacturing overheads are considered as part of the cost of the product.

Administrative Costs are costs pertaining to any activity undertaken in the administrative function of a business organization.

Budgeted Costs represent an estimate of expenditure for different phases or segments of business operations such as manufacturing, administration, sales etc.

Committed Costs are those to which the business has been committed due to decisions and actions taken by the management in the past.

Controllable Costs are those that can be controlled by a particular person or a group of persons in the organization.

Conversion Costs include direct labour costs plus manufacturing overhead costs.

Cost Behaviour is the way in which a cost reacts or responds to changes in the level of business activity.

Cost Center is the smallest segment of activity or area of responsibility for which costs are accumulated.

Cost Driver: Indirect costs are assigned to the cost objects on some reasonable basis. This basis chosen for allocation is called Cost Driver.

Cost Unit or Cost Object is nothing but an entity, object or activity for which cost is being determined.

Differential Cost: Change in cost due to change in the level of activity or pattern or method of production is known as Differential Cost.

Direct Costs are the costs that can be readily and specifically identified with the cost object.

Direct Costing is the ascertainment of direct costs in respect of department, process or product. This is marginal cost plus fixed cost which is directly chargeable to the department, process or product.

Distribution Costs are the costs associated with the activity of making the goods or services physically available to the ultimate consumer.

Fixed Costs are those which remain fixed at the same amount irrespective of the level of activity or quantum of output.

Historical Costs are costs which have already been incurred.

Incremental Cost is the increase in cost.

Indirect Costs in relation to a cost object are costs that cannot be readily and specifically identified with that cost object.

Joint Costs are the costs incurred till the point when different joint products become separately identifiable and subsequent costs separately measurable.

Manufacturing and Production Costs include all costs incurred from the time of procurement of materials to finished goods coming out of the production pipeline.

Marginal Cost is the additional cost to be incurred for producing an additional unit.

Marginal Costing is a costing method in which only the variable costs are considered as product costs and all fixed costs are considered period costs.

Normal Costs are costs which the organization incurs on a particular activity under normal, external and internal circumstances.

Out-of-Pocket Costs result in cash outflow as opposed to just amortization of costs already incurred. For example: depreciation.

Uncontrollable Costs are costs which cannot be controlled.

Variable Costs are those which vary in direct proportion to the volume of output.

7.11 Self - Assessment Test

1. How do you distinguish between selling and distribution costs?
2. What are fixed, variable and semi-variable costs?
3. Explain the meaning of sunk cost, opportunity costs, out-of-pocket costs and imputed costs.
4. What is the relation between cost behaviour and cost estimation?
5. How are indirect costs treated in cost accounting?
6. Explain the treatment of scrap while preparing a cost sheet.
7. Distinguish between budgeted and standard costs.

7.12 Suggested Readings/Reference Material

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7.13 Answers to Check Your Progress Questions

1. (d) Nature of business

Costs are classified on the basis of nature of element, functions, traceability, variability, controllability, normality, capital or revenue, time, identification as part of inventory, according to planning and control, managerial decisions and others.

2. (b) Standard Costs

The functional classification of costs includes manufacturing and production costs, administrative costs and selling and distribution costs. It does not include standard costs.

3. (e) Standard costing is merely an arithmetic exercise

Budgeted costs are estimated costs and facilitate planning while standard costs are desired costs that facilitate control.

4. (c) Irrelevant in decision-making

Sunk cost is another name for historical cost. It is a cost that has already been incurred and is irrelevant to the decision-making process.

5. (b) Abnormal Cost

It is the cost, which is normally incurred at a given level of output in conditions which are not favourable for that level of output. It is not considered as a part of cost of production and charged to Costing Profit and Loss Account.

6. (d) Where costs are incurred

The smallest segment of activity or area of responsibility for which costs are accumulated is designated as a cost center.

7. (d) Dividends paid

While preparing a cost sheet, the items such as interest paid, dividends paid, transfer to reserves, donations paid, preliminary expenses written off, goodwill written off, cash discount paid, provision for taxation, provision for income tax, profit/loss on sale of fixed assets etc., are excluded

8. (a) Tender

Very often management is required to quote the prices of its products in advance or has to submit tenders for goods to be supplied. A tender has to be prepared very carefully as the receipt of orders depends upon the price quoted.

9. (b) Cost control and Product costing

Tracing of costs is an attempt to assign costs on the basis of their cause. Tracing of costs is essential for two primary reasons: cost control and product costing.

10. (c) Prime Cost + Factory Overheads + Opening stock of work in progress – closing stock of work in progress = Factory Cost

Factory cost is also known as works cost. It is arrived at by adding all direct costs (prime cost) and factory overheads and adjusting for opening and closing work-in-progress.

Unit 8

Cost Analysis and Decision Making

Structure

8.1 Introduction

8.2 Objectives

8.3 Concept of Relevant Cost and Irrelevant Cost

8.4 Costs for Decision Making

8.5 Marginal Costing and Differential Cost Analysis

8.6 Make or Buy Decisions

8.7 Accept or Reject an Order/Foreign Orders or Exploring New Markets

8.8 Purchasing or Leasing

8.9 Sell or Further Process Decision

8.10 Product Mix Decision under Capacity Constraint

8.11 Closing Down of Factory or Segment

8.12 Marketing Decisions

8.13 Fixation of Selling Price

8.14 Pricing Methods

8.15 Selling Agents vs. Sales Force

8.16 Target Costing

8.17 Summary

8.18 Glossary

8.19 Self-Assessment Test

8.20 Suggested Readings/Reference Material

8.21 Answers to Check Your Progress Questions

8.1 Introduction

The previous unit introduced us to the costs terms and classification. The cost classification is the basis for various managerial decisions. This unit showcases how cost information data is useful for production, marketing and pricing decisions. Managerial decision-making is the process of choosing one among alternative courses of action. The manager chooses that course of action, which he considers as the most effective for achieving goals and solving problems. Decision-making is an integral part of all management functions – planning, organization, coordination, and control. All decisions are futuristic in nature, involving a forecast of what management thinks is likely to occur. But future is highly uncertain. Thus, business decisions have to be made with the full realization that there is some probability of the prediction, which underlies the decision taken, going off the mark. Some decisions are routine in nature. These

decisions take up very little of the manager's time either because there is very little uncertainty or because the cost is insignificant. On the other hand, managers have to take 'nerve-racking' decisions. The manager has to spend a considerable amount of time and thought on these decisions because they are crucial to the organization.

In this unit, we will be discussing the significance of costs for decision making, meaning of Relevant Cost and Irrelevant Cost, Marginal Costing and Differential Cost Analysis and interpret the various managerial decisions on the basis of Cost information and analysis. We will also be discussing the various considerations required for fixation of selling price, different pricing methods, distribution related problems and the concept of target costing.

8.2 Objectives

After reading through the unit, the student should be able to:

- Interpret the significance of cost analysis for taking managerial decisions
- Distinguish between relevant and irrelevant cost
- Explain the marginal costing and differential costing analysis
- Explain the various production related decisions such as make or buy, accept or reject a foreign order, purchase or lease, sell or further process, closing down the factory or a segment
- State the major considerations for fixation of selling price
- Explain the different pricing methods
- Compare the channels of distribution that is the Selling Agents vs. Sales Force; and
- Describe the target costing approach

8.3 Concept of Relevant Cost and Irrelevant Cost

Any financial decision involves a cost-benefit analysis. One significant component of this analysis is to quantify the costs that are relevant for a decision. Cost data are important since they are the basis in making decisions that are geared towards maximizing profit, or attaining other objectives. However, not all costs are important in decision-making.This calls for a segregation of costs on the basis of their effect on a decision. Such segregation is done by classifying costs into relevant costs and irrelevant costs.

Such segregation is done by classifying costs into relevant costs and irrelevant costs. Examples of situations in which the relevant vs irrelevant classification is useful include decisions regarding:

Shutting down a division of a business,

Accepting an special order at lower price,

Making a product in-house or purchasing it from outside,

Selling a semi-finished product or processing it further, etc.

Relevant Costs: Relevant costs are given the utmost importance in managerial decision-making. Their magnitude will affect a decision being made. The concept of managerial decision-making involves planning for the future of the business in terms of new products, entry into new markets etc., and other decisions like alternative course of actions to be taken at various situations. During the course of such decision-making, the management has to consider various cost related aspects. These costs are also called relevant costs as they are relevant for future decision-making. So, a cost can be considered as relevant cost if it is relevant and aids in helping the management to take right decision to achieve the objectives of the company.

For example, a company now has two types of products and the direct material cost per unit is ₹ 25 and direct labour cost per unit is ₹ 20. It wants to make some changes in its product line. The new product line requires direct material at ₹ 25 per unit and labour cost of ₹ 22 per unit. In this case, the cost of material is constant and it is not relevant for decision-making. The labour cost is changing from the present level in case of the proposal. Hence, the labour cost is relevant.

Irrelevant Costs: Irrelevant costs are those costs which will not be affected by any decision made by the management.

Characteristics of Relevant Cost

We are already familiar with the concept of relevant costs. Relevant costs are the costs that will make difference when one alternative is selected over the competing alternatives. Essentially, relevant costs have the following two characteristics:

They are expected future costs: All future costs are not necessarily relevant to decision-making purposes, but no costs are relevant unless they pertain to the future. Expected future costs mean that the costs are expected to occur during the time period covered by the decision. Past or historical costs are relevant to the decisions only if they are expected to continue in the future.

They differ between alternatives: If the same costs are incurred for both the alternatives, then they are not relevant. If the costs incurred for the alternatives are different, then they become relevant costs.

For example, if the manager is evaluating the purchase of either a manual or an automated drill press, both of which require skilled labour costing ₹ 80 per hour, the labour rate is not relevant since it is the same for both the alternatives. If however, the manual drill press requires only semi-skilled labour at ₹ 60 per hour whereas the automatic drill press requires skilled labour at ₹ 80 per hour, then the labour rate is relevant because it is different for the two alternatives. The difference between the amounts of the two costs is called differential cost or incremental cost.

8.4 Costs for Decision Making

Typically, in a cost accounting system, each product is charged with a portion of indirect costs, which are not traceable to the product. Hence, cost figures drawn from the cost accounting system are often not relevant since they are historical costs. Remember that costs, which differ between the alternatives in future alone, are seen as relevant.

Sunk Cost

A sunk cost is an expenditure made in the past that cannot be changed. These are past costs not future costs. Thus, these costs are not relevant for decision-making. For example, the cost of machinery purchased in 1995 is not relevant now in deciding whether to sell the machinery or not.

Variable Cost

Variable costs are the costs that vary with the level of activity. If they vary with different alternatives they are relevant for decision-making. Thus, it should be remembered that all variable costs are not relevant for decision-making.

Fixed Cost

For the purposes of short-term decision-making, fixed costs may be either relevant or irrelevant. When a fixed cost is incurred, only if a certain decision is taken, it is relevant. For example, the manufacture of a new product may entail the salary of a production supervisor. His salary, a fixed cost that will be incurred only if the new product is manufactured, is a relevant cost. If a fixed cost is incurred irrespective of whatever decision is taken in a certain situation, it is an irrelevant cost. For example, the salary of chief executive is incurred whether or not a new product is manufactured. Hence, in the context of a decision relating to the manufacture of the new product, the salary of chief executive, a fixed cost, is not relevant. Thus, it should be remembered that all fixed costs are not irrelevant for decision-making.

Opportunity Cost

This cost represents the benefit foregone in sacrificing the best alternative. To illustrate, consider the use of a machine for manufacturing product A. If product A is not manufactured, the best alternative use of the machine is to manufacture product B that generates certain revenue. The revenue of Product B forgone to manufacture Product A is the opportunity cost. Opportunity cost is a pure decision-making cost. It is an imputed cost, which does not require cash outlay, and it is not entered in the accounting books.

Out-of-Pocket Cost

There are certain costs, which require cash payment to be made (like salaries and wages, rent) whereas many costs do not require cash outlay (like

depreciation). Out-of-pocket costs involve cash outlays or require the utilization of current resources. These may include direct cost or indirect cost or variable cost or fixed cost. These are relevant for making decisions like make or buy, price fixation during depression etc.

Differential Cost

In management accounting, differential cost is used as a synonym to relevant cost. This can be defined as the change in the cost due to change in the level of activity or pattern or method of production. In other words, it is the difference between the costs resulting from the contemplated change. If the change in the cost is in the increasing form, it is called incremental cost, if it is decreasing with the decrease in output, it is called decremental cost. For proper analysis of differential cost, we should know the concept of incremental revenue, incremental costs, decremental revenue and decremental costs. Incremental cost increases between two alternatives whereas, decremental cost decreases between two alternatives. Incremental revenue increases between two alternatives, while decremental revenue decreases between two alternatives.

Features

The following are the main features of differential cost:

- Differential cost differs from one course of action to another.
- The differential cost data is related to costs, revenue and investment factors.
- Differential cost considers only incremental cost or decremental costs and not the cost per unit.
- While selecting an alternative, the proposal with positive difference between the revenue and cost is considered.
- Differential costing technique is used to analyze and present data for decision-making and it is not a regular or routine accounting work.

Differential Cost Analysis

While making decisions, management compares two or more alternatives. Differential cost analysis or differential costing is a special technique to help management in decision-making which shows how costs and revenues would differ under different alternative courses of action.

8.5 Marginal Costing and Differential Cost Analysis

Some management accountants use differential cost as a synonym to marginal cost. In fact, the theory of marginal costing is only a part of differential cost analysis. It is much more wider than the concept of differential cost analysis.

8.5.1 Concept of Marginal Costing

Marginal Costing is a method of costing that deals with decision making on the basis of marginal or variable costs. Under marginal costing, all the costs are segregated into:

1. Variable Expenses
2. Fixed Expenses
3. Semi Variable/ Semi Fixed Expenses

Decisions are taken by ascertaining contribution using the formula:

Contribution = Sales – Variable Cost

OR

Fixed Cost + Profit

This can be represented as follows:

Sales – Variable Cost = Fixed Cost + Profit

The above equation is referred to as the marginal costing equation.

8.5.2 Concept of Break-even analysis under Marginal Costing

Break Even Point is the point or state of a business at which there is neither a profit nor a loss. In other words, it is at this point where the contribution is equal to fixed expenses.

$$Break\ Even\ Point\ (In\ Value) = \frac{\text{Total Fixed Costs}}{\text{P/V Ratio}} \times 100$$

$$\text{Break Even Point (In Units)} = \frac{\text{Total Fixed Costs}}{\text{Contribution per unit}} x100$$

Break even in situations under which the costs of operating two alternative plants are equal. Though both the plants may have the same total costs, their total fixed costs and variable costs per unit may be different. In such a case, the firm may like to determine that point at which the total costs (fixed and variable) of operating both the plants are the same. Such a point may be called 'cost break-even point'.

$$\text{Cost Break Even Point (Or Indifferent Point for the 2 Plants)} = \frac{\text{Difference in fixed cost}}{\text{Difference in variable cost per unit}} x100$$

Alternatively: The Cost Break Even Point can also be determined by solving the following relation for the value of x.

Cost Break Even Point = Fixed Cost of plant 1 + (Variable cost per unit of plant 1*X)

Fixed Cost of plant 2 + (Variable cost per unit of plant 1*X)

"X" in the above relation represent cost break-even point.

8.5.3 Concept of Margin of Safety

The Margin of Safety represents the difference between the sales at break-even point and the total sales. It can be expressed as a percentage as well as in value. The size of the margin of the safety shows the strength of the business.

$$\frac{\text{Profit} * \text{Sales}}{\text{Contribution}} \quad \text{or} \quad \frac{\text{Profit}}{\text{P/V Ratio}}$$

Example of Margin of Safety

Let's assume that a company currently sells 3,000 units of its only product. The company has estimated that its break-even point is 2,800 units. Therefore, the company's margin of safety is 200 units.

Angle of incidence:

This is obtained from the graphical representation of sales and cost. When sales and output in units are plotted against cost and revenue the angle formed between the total sales line and the total cost line at the break-even point is called the angle of incidence.

8.5.4 Similarities with Differential Costing

a. Both techniques are based on the classification of costs into fixed and variable. If fixed costs do not change, the results under both remain the same.

b. Both techniques are used for cost analysis.

c. Both techniques are used for managerial decision-making and formulating policies.

8.5.5 Differences with Differential Costing

The following Table 8.1 shows the differences between differential cost analysis and marginal cost analysis:

Table 8.1: Differences between Marginal Costing and Differential Costing

Sl.No	Differential Cost Analysis	Marginal Costing Analysis
i.	It is a costing technique used for decision-making purpose with the use of differential revenue and differential cost.	It is a technique used in ascertaining the marginal cost and effect on changes in profit due to changes in volume.
ii.	This method can be applied in varied alternative proposals, hence the scope is wider.	The scope of marginal costing is comparatively less.

Sl.No	Differential Cost Analysis	Marginal Costing Analysis
iii.	Differential costing uses the accounting information and it can only be part of accounting system.	Marginal costing system can be included in accounting system.
iv.	The main analytical tools used in differential costing are incremental/ decremental cost, incremental revenue and incremental/decremental profit.	In marginal costing, the main analytical tools are P/V ratio, break-even point, contribution, CVP analysis etc.
v.	It is not possible to ascertain exactly the differential cost and sometimes it is used in conjunction with costs and opportunity cost.	The marginal cost can be calculated exactly by adding variable overheads to prime cost.
vi.	Differential costing can be used for short-term, medium-term and long-term decision-making.	Marginal costing is mainly used for short-term and medium-term decision-making.

Source: ICFAI Research Center

Check Your Progress - 1

1. The relevance of a particular cost to a decision is:
   a. Basis of apportionment of cost
   b. Size of the cost
   c. Risk involved in the decision
   d. Accuracy of the cost
   e. Potential effect of the cost on the decision
2. Which of the following represents a cost not relevant for decision-making?
   a. Marginal cost
   b. Differential cost
   c. Out-of-Pocket cost
   d. Variable cost
   e. Sunk cost
3. From the options given below, identify one of the features of differential cost.
   a. It is a sunk cost
   b. It is a future cost

c. It is an irrelevant cost
d. It is synonymous to marginal cost
e. It uses break-even analysis

4. There are certain costs, which require cash payment to be made. What are these costs known as?

a. Variable costs
b. Fixed costs
c. Out-of-Pocket costs
d. In-the-Pocket costs
e. Imputed costs

5. Which of the following statements represent a dis-similarity between marginal costing and differential costing?

a. Both techniques are based on the classification of costs into fixed and variable. If fixed costs do not change, the results under both remain the same.
b. Both techniques are used for cost analysis.
c. Both techniques are used for managerial decision-making
d. Both techniques aid in formulating policies
e. Both techniques are used for long-term decision-making

8.6 Make or Buy Decisions

A firm that is presently buying a product or part from outside may consider manufacturing that product or part in the firm itself. Such a decision-making alternative requires the firm to know through marginal costing what contribution to fixed costs will result from a 'make' decision.

Make or buy decisions will be taken with the help of marginal costing in the following manner:

a. When the capacity is available and it cannot be utilized for manufacture of other products, then the purchase cost is compared with the marginal cost or the total cost is compared with the purchase cost plus fixed cost of manufacture to take the decision to make or buy.

b. When the capacity is available and it can be utilized for manufacture of other products, the purchase price should be compared with the marginal cost of the product plus opportunity cost, i.e., the loss of contribution of other product replaced.

c. When there is no additional capacity available and it is proposed to acquire additional facilities for manufacture, the purchase price should be compared with the marginal cost plus fixed cost likely to be incurred for manufacturing with additional facility.

Make or buy decision is important for any company. So before taking any decision one should consider certain things as:

- The capacity of the company in terms of people, plant, space etc., to achieve the required quantity and quality.
- The differential cost of making or buying the item.
- The opportunity cost of using existing capacity to manufacture alternative items.
- The level of variable overheads, which are charged to the item.

Illustration 8.1

RMS Ltd. manufactures sewing machines which have three components. The following data pertains to these components.

Component	Machine Hours	Variable Cost (₹)	Fixed Cost (₹)	Total (₹)
P	15	72	24	96
Q	24	90	30	120
R	30	90	90	180
Packing		150	60	210
Total		402	204	606
Selling price				750

The market offers a good demand for company's product, but the company is not able to supply the products due to the machine capacity limitation. So the management decided to purchase one component from outside supplier and produce maximum products with the capacity of the bought product. The purchase price of the three components is:

P at ₹150, Q at ₹180 and R at ₹240. You are required to help the company management decide which component to buy from outside.

Solution

Purchase	Machine hour		% Utilization	
Nil	–	69		100
P	69 – 15	54	69/54	128
Q	69 – 24	45	69/45	153
R	69 – 30	39	69/39	177

Particulars	Present	If P Purchased	If Q Purchased	If R Purchased
Variable Cost: (₹)				
P	72	150	72	72
Q	90	90	180	90
R	90	90	90	240
Packing	150	150	150	150
Total variable cost (₹)	402	480	492	552
Selling price (₹)	750	750	750	750
Contribution (₹)	348	270	258	198
Capacity utilization (%)	100	128	153	177
Contribution	116	345.6	394.7	350.5

As the contribution derived by manufacturing P and R and purchasing Q from outside is highest, the component Q should be purchased from the suppliers.

Illustration 8.2

Payal Ltd., manufactures a picnic table which has three components A, B and C, one of each being required for each table. The company is working to its full machine capacity of 28,000 hours per period and the machinery used is capable of making all the components.

Data relating to current production are:

Components	Machine Hours	Variable Costs (₹)	Fixed Costs (₹)	Total Costs (₹)
A	6	150	60	210
B	10	180	70	250
C	12	180	180	360
	Assembly	320	130	450
		830	440	1,270
			Profit	230
			Selling Price	1,500

Over the next budget period the machine capacity cannot be increased although the assembly capacity can be increased as required. The budget for the next period is being prepared. Because sales are buoyant the purchase of one of the components is being considered and the following quotation has been received:

Component	Price (₹)
A	220
B	280
C	320

The company has decided that only one component will be bought outside in any one period. The sales manager thinks that he could sell at least 50% more tables than at present and probably 75% more provided that the production capacity was available.

You are required to:

i. Give a statement showing current profitability.

ii. Recommend which component should be bought outside if production is increased by 50% and how many components should be bought.

iii. Recommend which component should be bought outside if production is increased by 75% and how many components should be bought.

Solution

i. **Current Production**

Machine hrs per unit of A – 6 hrs; B – 10 hrs; C – 12 hrs; Total 28 hrs

Current machine hrs	= 28,000 hrs
Production (no. of tables)	= 28,000 hrs / 28 hrs = 1,000 picnic tables

Profitability:

Sales value:	1,500 x 1,000	=	15,00,000
Less: Variable Costs	830 x 1,000	=	8,30,000
Contribution		=	6,70,000
Less: Fixed Costs		=	4,40,000
Profit		=	2,30,000

Particulars	A	B	C
Purchase price (₹)	220	280	320
Variable Cost of Manufacture (₹)	150	180	180
Savings (₹)	70	100	140
Hours per unit	6	10	12
Savings per hour (₹)	11.67	10	11.67
Ranking for manufacturing	I	II	I

ii. If production is increased by 50% – 1000 x 150% = 1,500

Particulars	Hours
A = 1,500 x 6 =	9,000
B = 1,500 x 10 =	15,000
C = 1,500 x 12 =	18,000
Total	42,000

But the total available hours are only 28,000 hrs.

The lower ranked product B should be purchased. Manufacture of A & C will require 9,000 + 18,000 = 27,000 hrs. With Balance 1000 hrs, 100 units of B can be manufactured and 1,400 of B can be purchased.

Resultant profit would be:

Particulars					₹
Sales Value:	1,500	x	1,500	=	22,50,000
Less: Variable Cost					
A : Manufacture	1,500	x	150	=	2,25,000
B : Manufacture	100	x	180	=	18,000
Purchase	1,400	x	280	=	3,92,000
C : Manufacture	1,500	x	180	=	2,70,000
Assembly	1,500	X	320	=	4,80,000
Contribution					8,65,000
Less: Fixed Cost					4,40,000
Profit					4,25,000

iii. If production is increased by 75% = 1,000 x 175% = 1,750

Machine hrs required A: 10,500 B: 17,500 C: 21,000.

When production is increased to 1,750 hours and if the lower ranked product B is purchased, A & C would require 10,500 + 21,000 = 31,500 hrs. But only 28,000 hrs are available. The company has taken a decision to purchase one component only. Hence C should be purchased. Now A & B would require 10,500 + 17,500 = 28,000 hrs. which are at hand.

The resultant profit would be:

Particulars	₹	₹
Selling price		1,500
Less: Variable Cost		
A: Manufacture	150	
B: Manufacture	180	
C: Purchase	320	
Assembly	320	970
Contribution per unit		530
Contribution from 1,750 tables		9,27,500
Less: Fixed Cost		4,40,000
Profit		4,87,500

8.7 Accept or Reject an Order/Foreign Orders or Exploring New Markets

The companies may get special orders from their customers for the supply of their regular products. In such cases, they have to decide whether the order should be accepted or rejected. The special orders may be either from the domestic or foreign customers. The customers will be quoting a price less than the normal selling price for such special orders. The companies usually take decision in such circumstances on the basis of differential cost analysis. So, they compare the incremental revenue with the differential cost. A company should consider the following factors before taking the accept/reject decision:

a. The effect on the future revenue due to temporary reduction in selling price.

b. The impact of reduced selling price on the existing customers when they come to know of the price reduction for special order.

c. Possibility of selling extra units to new customers other than the special order.

d. Reliability of the cost estimates for the special order.

e. The effect of the present and future capacity in terms of plant expansion, finance, human resources etc.

Illustration 8.3

A factory manufacturing mechanical toys presents the following information for the year 20xx:

Particulars	(₹) (Present 30,000 units level)
Material cost	2,40,000
Labour cost	4,80,000
Fixed overheads	2,40,000
Variable overheads	1,20,000
Units produced	30,000 units
Selling price per unit	₹ 40

The available capacity is for production of 40,000 units per year. The firm has an offer for the purchase of 10,000 additional units at a price of ₹30 per unit. It is expected that by accepting this offer, there will be a saving of ₹.1 per unit in material cost on all units manufactured; the fixed overheads will increase by ₹ 40,000 and the overall efficiency will drop by 3% on production.

Prepare a statement showing the variation of net profits resulting from the acceptance of the order.

Solution

Statement Showing the Variation of Net Profit Resulting from the Acceptance of the Order

No.	Particulars	30,000 units	40,000 units	Variation
	Material	2,40,000	2,80,000	40,000
	Labour	4,80,000	6,59,794	1,79,794
	Variable overheads	1,20,000	1,60,000	40,000
i.	Total variable cost	8,40,000	10,99,794	2,59,794
ii.	Sales	12,00,000	15,00,000	3,00,000
	[30,000 @ ₹ 40 per unit] [30,000 @ ₹ 40 per unit +10,000 @ ₹ 30 per unit]			
iii.	Contribution (ii) – (i)	3,60,000	4,00,206	40,206
iv.	Fixed cost	2,40,000	2,80,000	40,000
v.	Profit	1,20,000	1,20,206	206
The net profit will increase by ₹ 206 by the acceptance of additional order of 10,000 units.				

Illustration 8.4

The following particulars are extracted from the cost records of Hindustan Shoes Ltd. Capacity utilization is 80%.

Particulars	₹
Sales	18,50,000
Direct material	5,00,000
Direct expenses	3,00,000
Variable overhead	1,50,000
Fixed overhead	5,50,000

The company got an order from the UK to export shoes for which it requires 50% of its plant capacity. The price is 10% less than the current price. The factory capacity can be increased by 10% with an extra cost of ₹ 1,00,000. You are required to advise the company whether to accept or reject the order.

Solution

If the company accepts the order, 50% of the plant capacity will be used for the special order and the rest of 50% plus the increased 10% capacity will be used for local market. To arrive at a decision, we need to consider the incremental revenue and the differential cost.

Incremental Revenue:

Local sales 60%

Sales revenue at 60% capacity = (18,50,000 x 60) / 80 = ₹13,87,500

The foreign order = 50% @ 10% less than the current price

= (18,50,000/80) x 50 – 11,56,250 x (10/100)

= 11,56,250 – 1,15,625 = ₹ 10,40,625

Total proposed sale = ₹13,87,500 + ₹.10,40,625 = ₹ 24,28,125

Less: Present sale = ₹ 18,50,000

Incremental revenue = ₹ 5,78,125 i.e. (24,28,125 – 18,50,000)

Differential Cost:

Proposed cost for110%			₹
Direct material	= (5,00,000/80) x110	=	6,87,500
Direct expenses	= (3,00,000/80) x 110	=	4,12,500
Variable expenses	= (1,50,000/80) x 110	=	2,06,250
Fixed cost		=	5,50,000
Extra to be incurred		=	1,00,000
			19,56,250
Less: Present cost		=	15,00,000
Differential cost		=	4,56,250

As the incremental revenue exceeds the differential cost, the order can be accepted.

8.8 Purchasing or Leasing

In case of capital investment decision, the company management will consider two alternatives: (a) whether the asset should be purchased, or (b) it should be leased. For the decision-making purpose, the total cost of the two alternatives will be compared to determine the additional savings. If there is a savings on purchase, then it should be considered and vice-versa.

Illustration 8.5

ABC Ltd., has two alternatives to acquire a godown. Either the company can purchase the godown for ₹ 8,80,000 or acquire it on lease for an annual rent of ₹ 88,000. If the godown is purchased, then the land will cost ₹ .88,000 and renovation will be ₹ 1,32,000. If the company takes the godown on lease, it has to pay the insurance charges and tax. The insurance charge will be 1.1% to be computed on the value before renovation and it will be constant after that. The tax on property is ₹ 26,400. Repairs and maintenance to the property will be

₹ 26,400. The estimated life of the godown is 20 years and depreciation is charged at straight-line method. The amount required to purchase the godown will yield 8% tax exempted interest if invested in securities. Advise the management and help it to decide whether to lease or purchase.

Solution

Statement Showing the Annual Operating Cost for Two Alternatives

Particulars	Purchase (₹)	Lease (₹)
Property Tax/Repairs	26,400	26,400
Insurance 1.1 % on 7,92,000	8,712	8,712
Depreciation (7,92,000 + 1,32,000)/20	46,200	–
Lease rent	–	88,000
Total cost	81,312	1,23,112
Interest (opportunity cost) 8,80,000+1,32,000 @ 8%	80,960	
Total cost + opportunity cost	1,62,272	1,23,112

From the above analysis it is clear that the firm should go for leasing of the godown. The company can invest its money in marketable securities and get the interest income that is tax-free.

8.9 Sell or Further Process Decision

In process industries different products are seen at every stage of process. The companies can dispose of these products in the market directly or they can further process these products and sell it at a higher price. Differential cost analysis can be used for this purpose to know whether the product can be sold profitably or it requires further processing to charge a premium. If there is no further capital investment, the decision can be taken by comparing differential cost for processing and the incremental revenue.

Illustration 8.6

Deccan Agro Products Ltd., produces two joint products. The following cost information is available for the year 20xx.

Products	Production in kgs	Sale price (₹)
X	12,000	30
Y	24,000	40

The product Y can be processed further and product Z can be produced. Product Z can be sold in the market at ₹ 85 per kg. It requires an additional cost of ₹ 10,000 to process 24,000 kg. of product Y and the output of this process will be 12,000 kg. of Z. You are required to help the management decide in this respect.

Solution

Particulars	₹
Incremental revenue:	
Product Z = 12,000 x 85	9,84,000
Product Y = 24,000 x 40	9,60,000
Incremental revenue	24,000
Differential cost:	
Additional processing cost	10,000
Incremental profit	14,000

As the incremental profit is more than the differential cost, the company should further process the product Y into product Z.

Illustration 8.7

Fargo Ltd., manufactures two joint products P and Q. The following cost information is available from the company records.

Particulars	₹
Sales (P and Q)	9,37,500
Direct material	2,81,250
Direct wages	1,37,500
Variable overheads 150% of direct wages	
Fixed cost	2,50,000

The product P's sales constitute two-thirds of the total sales. The management is planning to process the joint products further to sell at a higher price. The following are the cost information estimated for further processing.

(Amount in ₹)

Particulars	P	Q	Total
Sales after further processing	7,50,000	3,75,000	11,25,000
Direct material	62,500	25,000	87,500
Direct wages	25,000	10,000	35,000

You are required to advise the management whether the further processing will be profitable.

Solution

Statement Showing Incremental Revenue and Differential Cost

(Amount in ₹)

Particulars	P	Q	Total
Sales on further processing	7,50,000	3,75,000	11,25,000
Less: Sales before processing	6,25,000	3,12,500	9,37,500
Incremental revenue	1,25,000	62,500	1,87,500
Additional cost on processing:			
Direct material	62,500	25,000	87,500
Direct wages	25,000	10,000	35,000
Variable overheads	37,500	15,000	52,500
Total additional cost	1,25,000	50,000	1,75,000
Profit on further processing	Nil	12,500	12,500

The management should process product Q that gives extra profit to the business and product P should be sold from the present stage and it does not require further processing.

8.10 Product Mix Decision under Capacity Constraint

When a concern manufactures more than one product, a problem often arises as to the product mix or the sales mix which will yield the maximum profits. In determining the optimum or profitable sales mix, the products, which give the maximum contribution, are to be retained and their production should be increased. The production of products, which make comparatively less contribution, should be reduced or dropped altogether.

Illustration 8.8

A confectioner markets three products, all of which require sugar. His average monthly sales, cost of sales and sugar consumption are as follows:

Particulars	Product A	Product B	Product C	Total
Sales (₹)	1,00,000	1,20,000	80,000	3,00,000
Cost of Sales (₹)	60,000	80,000	56,000	1,96,000
Sugar Requirement (kg.)	5,000	8,000	2,400	15,400

Due to government restrictions, his sugar quota has been reduced to 14,500 kg., per month. Suggest a suitable sales mix, which would give the confectioner maximum profit under the given circumstances.

Solution

Availability of sugar is the limiting factor so we have to find out profit per kg of sugar in case of each product, to determine the profitability of various products.

Particulars	Product A	Product B	Product C
Sales (₹)	1,00,000	1,20,000	80,000
Less: Cost of Sales (₹)	60,000	80,000	56,000
Profit (₹)	40,000	40,000	24,000
Sugar requirement (Kgs.)	5,000	8,000	2,400
Profit per kg of sugar (₹)	8	5	10

If we see profit per kg of sugar we come to the conclusion that product B is the least advantageous product and product A and Product C should be given preference over product B.

Sugar quota is 14,500 kgs whereas present requirement of sugar is 15,400 kgs. Therefore, present sales of all products cannot be continued, sales of least profitable product B should be reduced to cope with the shortage of sugar. Then the suitable sales mix is:

Particulars	Sales	Sugar Requirement (kgs)
Product A	1,00,000	5,000
Product C	80,000	2,400
Product B	1,06,500	7,100
	$\left[\frac{7,100}{8,000} \times 1,20,000\right]$	(14,500 – 7,400)

Illustration 8.9

P Ltd. produces two products and the following particulars are available regarding them:

Particulars	Product P	Product Q
Sale price (₹)	24.00	14.00
Direct material cost (₹)	12.00	8.00
Direct labor (hours)	1	1/2
Standard rate per hour:		
Direct labor (₹)	8	8
Variable overhead (₹)	2	2

Fixed overheads budgeted ₹ 2,00,000

Total direct labor hours available 4,00,000.

The company does not want to reduce the production of product P below 1,20,000 units and of product Q below 4,00,000 units. Assume that materials are freely available and can be freely used with direct labor for either of products subject to the minimum production as stipulated above.

Suggest the best production program by outlining the steps, along with the statements for the purpose, and show the net profit expected from this program.

Solution

Calculation of Contribution

	Particulars	Product P (₹)	Product Q (₹)
1.	Sale price	24.00	14.00
2.	Variable cost:		
	Direct material cost	12.00	8.00
	Direct labor cost @ ₹ 8 per hour	8.00	4.00
	Variable overhead @ ₹ 2 per hour	2.00	1.00
3.	Marginal cost	22.00	13.00
4.	Contribution (1) – (3)	2.00	1.00
5.	Labor hours	1	0.50
6.	Contribution per labor hour (4)/(5)	2.00	2.00

Contribution for labor hour rate is same for either products, and excess labor hours can be used for any product or both products partly.

Particulars	Hours	Hours
Total hours available		4,00,000
Less: Labor hours required for minimum production program		
For 1,20,000 units of product P @ 1 hours per unit	1,20,000	
For 4,00,000 units of product Q @ 1/2 hour per unit	2,00,000	3,20,000
Labor hours available to be used for any product		80,000

If 80,000 labor hours are used for product P, then the production will be as follows:

Particulars	Product P (Units)	Product Q (Units)
Minimum production	1,20,000	4,00,000
80,000 labor hours used for production P @ 1 labor hour per unit	80,000	–
Production	2,00,000	4,00,000

Calculation of Profit for the above Production Program

Particulars	(Amount in ₹)
Contribution on 2,00,000 units of product P @ ₹2 per unit	4,00,000
Contribution on 4,00,000 units of product Q @ ₹ 1 per unit	4,00,000
Total Contribution	8,00,000
Less: Fixed Overheads	2,00,000
Profit	6,00,000

If 80,000 labor hours are used for product Q, the production program will be as follows:

Particulars	Product P (Units)	Product Q (Units)
Minimum production	1,20,000	4,00,000
80,000 labor hours used for product Q @ 0.5 labor hour per unit		1,60,000
	1,20,000	5,60,000

Calculation of Profit on the Second Production Program

Particulars	₹
Contribution on 1,20,000 units of product P @ ₹ 2 per unit	2,40,000
Contribution on 5,60,000 units of product Q @ ₹ 1 per unit	5,60,000
Total contribution	8,00,000
Less: Fixed overheads	2,00,000
Profit	6,00,000

From the above, it is clear that the net profit for the suggested programs is same because contribution per labor hour, the limiting factor, is the same for each product.

Illustration 8.10

Assuming that the rated capacity of the factory is 45,000 units, what should be the most profitable level of output?

Particulars	Output 30,000 Units	From 30,001 to 40,000	From 40,001 to 45,000
Fixed cost (₹)	30,000	32,000	39,000
Variable cost per unit (₹)	6	6	6.10
Sales revenue per unit (₹)	8	7.60	7.60

Solution

Comparative Statement of Different Output Levels

Output (in units)	Selling Price per Unit (₹)	Sales Value (₹)	Incremental Revenue (₹)	Variable Cost @ ₹6 and ₹6.10	Fixed Cost (₹)	Total Cost (Variable Plus Fixed)	Differential Cost (₹)
(a)	(b)	(c)	(d)	(e) = (a) x ₹	(f)	(g) = (e) + (f)	(h)
30,000	8.00	2,40,000	–	1,80,000	30,000	2,10,000	–
40,000	7.60	3,04,000	64,000	2,40,000	32,000	2,72,000	62,000
45,000	7.60	3,42,000	38,000	2,74,500	39,000	3,13,500	41,500

From the above, it is clear that incremental revenue exceeds differential cost up to 40,000 units, so a level of output of 40,000 units is the most profitable.

Illustration 8.11

Suchitra Ltd., has prepared the following budget estimate for the year 20x0-x1.

Particulars	Product M (₹)	Product N (₹)
Sales in Units	12,000	32,000
Selling price	80	128
Direct Materials	24	44
Direct Wages @Re.1 per Hour	16	24
Variable Overheads	8	12
Fixed Overheads	16	24
Total Cost	64	104
Profit	16	24

After finalization of the above budget estimates, it is observed that one-third of the production capacity is still idle. In order to improve the performance, the following proposals are considered:

a. Product M will be discontinued and the capacity so released will be used for product N. The selling price of product N will, however, have to be reduced by ₹ 4 per unit in order to increase the volume of sales.

b. Product N will be discontinued and the capacity so released will be diverted to the production of product P. The particulars relating to per unit of product P are as under:

Particulars	₹
Selling price	64
Direct materials	17
Direct labor @ Re/per/hr	12
Variable overheads	5

c. The idle capacity will be utilized for meeting an export demand for product Q. The particulars relating to per unit of product Q are as under:

Particulars	₹
Selling price	100
Direct materials	50
Direct labor @ 1Re/per/hr	25
Variable overheads	15

d. The idle capacity will be hired out by fixing a price in such a way that the same rate of profit per direct labor hour, as obtained in the budget estimates, is achieved.

Prepare a statement showing the profitability of the products M and N as envisaged in the budget estimates. Also evaluate each of the above four proposals separately and prepare statements showing the profitability under each proposal.

Solution

Calculation of Idle Capacity and Fixed Cost

Particulars	Product M	Product N
Labor hours required per unit (₹16/Re.1) (₹24/Re.1)	16	24
No. of units	12,000	32,000
Labor hours utilized	1,92,000	7,68,000

Total labour hours utilized = 1,92,000 + 7,68,000 = 9,60,000

Idle capacity = 1/3rd of the production capacity

Idle capacity in terms of labor hours = 9,60,000 x 3/2 x 1/3 = 4,80,000 hours

Total Fixed Cost:

Product M = 12,000 x ₹ 16 = ₹ 1,92,000

Product N = 32,000 x ₹ 24 = ₹ 7,68,000

Total Fixed Cost = ₹ 1,92,000 + ₹ 7,68,000 = ₹ 9,60,000

Calculation of Contribution per unit

Particulars	Product M (₹)	Product N (₹)
Direct materials	24	44
Direct wages @ Re.1 per hour	16	24
Variable overheads	8	12
Variable cost per unit (a)	48	80
Selling price per unit (b)	80	128
Contribution per unit (b) – (a)	32	48

Profitability Statement on the basis of Budget Estimates

Particulars	Amount (₹)
Total Contribution	
Product M 12,000 x ₹ 32	3,84,000
Product N 32,000 x ₹ 48	15,36,000
	19,20,000
Less: Fixed Cost	9,60,000
Profit	9,60,000

Proposal I

Capacity released by discontinuing M = 1,92,000 hours

Capacity released utilized for product N will produce additional units of Product N

= 1,92,000/24 = 8,000 units

Therefore, total production of Product N = 32,000 + 8,000 = 40,000 units

Profitability Statement

Particulars	Amount (₹)
Sales 40,000 units @ ₹ 124 (i.e., ₹ 128 – ₹ 4)	49,60,000
Less: Variable Cost of 40,000 units @ ₹ 80	32,00,000
Total contribution	17,60,000
Less: Fixed Cost	9,60,000
Profit	8,00,000

Proposal II

Capacity released by discontinuing N = 7,68,000 hours

Capacity released will produce product P = 7,68,000/12 = 64,000 units

Profitability Statement

Particulars	Amount (₹)	Amount (₹)
Sales:		
Product M 12,000 units @ ₹ 80	9,60,000	
Product P 64,000 units @ ₹ 64	40,96,000	50,56,000
Less: Variable Cost		
Product M 12,000 units @ ₹ 48	5,76,000	
Product P 64,000 units @ ₹ 34	21,76,000	27,52,000
		23,04,000
Less: Fixed Cost		9,60,000
Profit		13,44,000

Proposal III

Idle capacity of 4,80,000 hours will be utilized by producing product Q which takes
25 hours to complete one unit.

Production of Product Q = 4,80,000 /25 hours = 19,200 units

Profitability Statement

Particulars	Amount (₹)	Amount (₹)
Sales:		
Product M 12,000 units @ ₹ 80	9,60,000	
Product N 32,000 units @ ₹ 128	40,96,000	
Product Q 19,200 units @ ₹ 100	19,20,000	69,76,000
Less: Variable Cost:		
Product M 12,000 units @ ₹ 48	5,76,000	
Product N 32,000 units @ ₹ 80	25,60,000	
Product Q 19,200 units @ ₹ 90	17,28,000	48,64,000
		21,12,000
Less: Fixed Cost		9,60,000
Profit		11,52,000

Proposal IV

Profit as per budget estimates = ₹ 9,60,000

Labor hours utilized as per budget estimates = 9,60,000 hrs

Profit per labor hour = ₹ 9,60,000/9,60,000 hrs. = ₹ 1

Idle capacity as per budget estimates = 4,80,000 hours

Additional profit by hiring out idle capacity at the same rate of profit as per budget estimates 4,80,000 hours x Re.1 = ₹ 4,80,000

Add: Profit as per budget estimates = ₹ 9,60,000

Total Profit = ₹ 14,40,000

Proposal IV is recommended as it gives the maximum profit of ₹ 14,40,000.

8.11 Closing Down of Factory or Segment

Sometimes it becomes necessary for a firm to temporarily close down its factory or a segment due to trade recession. The decision regarding closing down will depend on whether products are making a contribution towards fixed costs or not. If the products are making a contribution towards fixed cost, it is not advisable to close the factory or segment to minimize the losses. Even though the factory is closed down, some fixed costs could not be avoided, for instance maintenance of plant or overhauling etc. So these must be taken into account while making a decision.

In addition to the cost consideration, some non-cost considerations should be taken into account before deciding to close down a factory or segment. The following are relevant in this respect:

a. Once the business is closed down, the competitors may take advantage of the situation to establish their products and business of the company. It is difficult to recapture the market. Heavy advertisement costs have to be incurred to recapture the market.

b. Once the workers are discharged it may be difficult to get experienced and skilled labourers again to restart the business.

c. If some segment or activities are closed down, it may affect the reputation of the firm.

d. Temporary close down may not be advisable, as the relationship with the suppliers is adversely affected.

e. Fear of non-collection of dues from debtors in case of closure of business may not go in its favor.

Illustration 8.12

Moon Ltd., manufactures 60,000 units of a product ‘A’ in a year at its normal production capacity. The unit cost consisting of variable costs and fixed costs at this level are ₹ 13 and ₹ 4 respectively. The selling price of Product A is ₹ 20.

Due to trade depression, it is expected that only 6,000 units of 'A' can be sold during the next year. The management plans to shut down the plant. The fixed cost for the next year then is expected to be reduced to ₹ 99,000. Additional costs of plant shutdown are expected at ₹ 36,000. Should the plant be shut down? What is the shutdown point?

Solution

Comparative Statement

Particulars	Plant is operated (₹)	Plant is shutdown (₹)
Variable cost 6,000 units @ ₹.13	52,000	
Fixed cost (60,000 x ₹ 4)	2,40,000	99,000
Additional shutdown cost	–	36,000
Total cost (a)	2,92,000	1,26,000
Sales (6,000 x ₹ 20) (b)	1,20,000	–
Loss (b) – (a)	1,72,000	1,26,000

Recommendation: A comparison of figures relating to two alternatives points out that loss is reduced by ₹ 46,000 (₹.1,72,000 – ₹ 1,26,000) if the plant is shut down.

Calculation of shutdown point:

Shutdown point = Total fixed cost – Shutdown cost/Contribution per unit

= ₹ 2,40,000 – ₹ 1,26,000/₹ 20 – ₹ 13 = 16,285 units.

Dropping or Adding Product Line

In a multi-product company, the management may have to decide on adding or dropping a product line. If a new product line is added, its sales and certain costs will also increase and reverse will happen when a product line is dropped. In order to arrive at such a decision, the management should compare the differential cost and incremental revenue and study its effect on the overall profit position of the organization.

A decision concerning the discontinuation of a product should be taken after considering the following:

- Competitive nature of the products of the company
- Value of resources released on discontinuation
- Contribution margin earned from that product
- Any contribution from that product will reduce the burden of total fixed costs of the firm and this will help in better profits than if such product is discontinued

Illustration 8.13

Excel Ltd., is engaged in 3 distinct lines of production. Their production cost per unit and selling prices are as under:

Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)
Production units	6,000	4,000	10,000
Cost:			
Material	36	52	60
Wages	14	18	20
Variable overheads	4	6	6
Fixed overheads	10	16	18
Total cost	64	92	104
Selling price	80	120	122
Profit	16	28	18

The management wants to discontinue one line and gives the assurance that production in two other lines shall rise by 50%. They intend to discontinue the line, which produces Product 'X', as it is less profitable.

a. Do you agree with the scheme in-principle? If so, do you think that the line which produces 'X' should be discontinued?

b. Offer your comments and show the necessary statements to support your decisions.

Solution

Particulars			₹
Total Fixed cost			
X	6,000	units @ ₹ 10	60,000
Y	4,000	units @ ₹ 16	64,000
Z	10,000	units @ ₹ 18	1,80,000
			3,04,000
Contribution =	Selling Price – Variable Cost		
	X =	₹ 80 – 54	₹ 26 per unit
	Y =	₹ 120 – 76	₹ 44 per unit
	Z =	₹ 122 – 86	₹ 36 per unit

If Product X is dropped

Sale of Y and Z will increase by 50%. Then the sales would be Y – 6,000 units, and Z – 15,000 units.

Particulars		₹
Total Contribution		
Product Y: 6,000 units @ ₹ 44 per unit	=	2,64,000
Product Z: 15,000 units @ ₹ 36 per unit	=	5,40,000
		8,04,000
Less: Fixed Cost	=	3,04,000
Profit	=	5,00,000

If Product Y is dropped

Sale of X and Z will increase by 50%. Then the sales would be X – 9,000 units, and Z – 15,000 units.

Particulars	₹
Total Contribution	
Product X: 9,000 units @ ₹ 26 per unit	2,34,000
Product Z: 15,000 units @ ₹ 36 per unit	5,40,000
	7,74,000
Less: Fixed Cost	3,04,000
Profit	4,70,000

If Product Z is dropped

Sale of X and Y will increase by 50%. Then the sales would be X – 9,000 units, and Y – 6,000 units.

Particulars	₹
Total Contribution	
Product X: 9,000 units @ ₹ 26 per unit	2,34,000
Product Y: 6,000 units @ ₹ 44 per unit	2,64,000
	4,98,000
Less: Fixed Cost	3,04,000
Profit	1,94,000

From the above, it is clear that, among the three alternatives, the highest amount of profit is earned when X line of production is discontinued. Thus, the management decision to discontinue X is correct.

Activity 8.1

The X Co. Ltd., is planning to open a petrol station. The selling price of diesel would be ₹ 4.40 per liter. The variable charges including cost of diesel, vending etc., is about ₹ 4.00 per liter. The fixed costs for a month is ₹ 6,810. State how many liters would need to be sold to achieve a profit of ₹ 2,800.

_____

_____

8.12 Marketing Decisions – Need for Pricing Decisions

Marketing is the only means for linking the producers (or potential producers) of a product or service with customers. Marketing arises naturally in all capitalist societies, but is not limited to capitalist societies. Its techniques are also applied in politics, religion, personal affairs, and many other aspects of life.

Generally, the term "marketing" refers to the promotion of products, especially advertising and branding. But in professional usage the term has broader meaning.

It can be divided into four categories, often called the four Ps.

Product: The product management aspect of marketing deals with the specifications of the actual goods or service, and how it relates to the end-user's needs and wants.

Pricing: This refers to the process of setting a price for a product, including discounts.

Promotion: This includes advertising, promotion, publicity, and personal selling, and refers to the various methods of promoting the product, brand, or company.

Place or Distribution: It refers to how the product gets to the customer; for example, point of sale placement or retailing.

These four elements are often referred to as the marketing mix.

In the subsequent pages, we will be discussing the need for pricing decisions, objectives of pricing, pricing strategy and various considerations required for fixation of selling price. We shall also discuss the different pricing methods, distribution problems and the concept of target costing.

One of the most important operating decisions that a management must make is the pricing decision. Pricing refers to the assignment of a selling price to a product or service provided by the company. A company's long range survival depends on its pricing decision. In the long run, the firm's prices must be sufficient to cover all costs and leave a profit margin, adequate to reward the investors. If the firm's revenue consistently fails to cover costs and provide a satisfactory profit, the investors will seek new opportunities and the firm will fail.

Pricing activities are more extensive than many people realize. It is easy to visualize the need to price each product in a department store or electrical goods store, but all organizations that provide a service for a fee or sell a product must decide on the amount to charge for each service or product. Thus, the number of products and services to be priced is quite large. Besides that, pricing does not end with a single pricing decision for each product or service. Prices must be continuously updated to ensure that they reflect management's desires in light of current costs, market conditions, and competitor actions.

Some prices may remain unchanged for a year or more. But some prices like the food prices fluctuate throughout the year. Thus, pricing decisions are not static but become a part of continuing activity.

8.13 Fixation of Selling Price

Fixation of selling price is one of the important functions of management. Prices are generally determined by market conditions and other economic factors. Cost-Volume-Profit analysis assists the management in the fixation of selling prices under various circumstances.

8.13.1 Pricing under Normal Conditions

Under normal circumstances, the prices are based upon total cost of sales so as to cover fixed as well as variable cost and, in addition, to provide for certain desired margin of profit. But prices can also be fixed on the basis of marginal cost by adding a sufficiently high margin to marginal cost so as to cover the fixed cost and profits. However, under other circumstances, products may have to be sold at a price below the total cost. In such circumstances, the prices should be fixed on the basis of marginal cost in such a manner so as to cover the marginal cost and contribute something towards the fixed expenses.

8.13.2 Selling Price below the Marginal Cost

Sometimes it may become necessary to reduce the selling prices to the level of marginal cost or even below the marginal cost. In the following circumstances, the selling price may be fixed even below the marginal cost:

- to introduce a new product in the market
- to explore foreign markets
- to eliminate the competitor from the market
- to avoid the retrenchment of workers
- to dispose of perishable products
- to avoid extra losses by closing down the business
- to dispose of surplus stocks, and
- to utilize idle capacity

Illustration 8.14

The marginal cost of a product is ₹ 15 and fixed expenses amount to ₹ 2,25,000. Selling price per unit is ₹ 17 and 40,000 units can be sold at this price. Should the company sell the product or not?

Solution

Total marginal cost = 40,000 units @ ₹ 15 per unit = ₹ 6,00,000

Fixed cost = ₹ 2,25,000

Total cost = ₹ 8,25,000

Total cost per unit = ₹ 8,25,000/₹ 40,000 = ₹ 20.625

Even though the selling price of ₹ 17 is below the total cost, it is advantageous to sell the product at the selling price of ₹ 17 which is more than the marginal

cost of ₹ 15. This will reduce the loss on account of fixed expenses (if the product is discontinued) by ₹ 80,000 as shown below:

Sales = 40,000 units @ ₹ 17 per unit = ₹ 6,80,000

Loss = Total Cost – Sales = ₹ 8,25,000 – ₹ 6,80,000 = ₹ 1,45,000

Loss if the product is discontinued (fixed expenses) = ₹ 2,25,000

Thus, loss of ₹ 80,000 (i.e. 2,25,000 – ₹ 1,45,000) will be reduced if product is sold at ₹ 17 per unit.

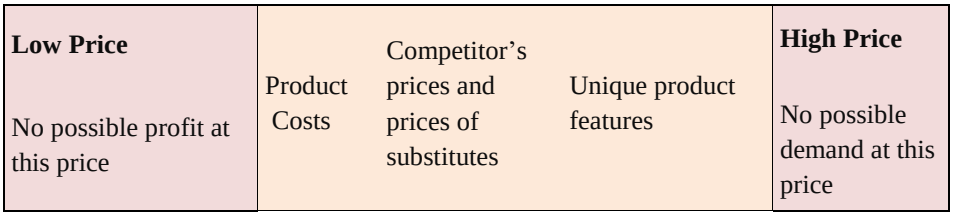
8.13.3 Pricing during Stiff Competition and Trade Depression

During stiff competition, products may be sold at a price below the total cost. In such circumstances, the price should be fixed on the basis of marginal cost in such a manner so as to cover the marginal cost and contribute something towards the fixed expenses. During the depression also products may be sold at a price below the total cost. There is a fall in the price as a result of depression. The prices can be safely reduced to an extent which covers the variable cost and contributes something towards the fixed cost.

8.14 Pricing Methods

The ideal solution to the problem of pricing is selecting a pricing method that suits the goals of the management of a company and its cost structure (refer to Figure 8.1). Let us assume that the company could estimate the demand schedule and the cost function and also it could acquire competitors' price list for comparison which helps the company establish its prices. Given these three, the company is now ready to select a price. The price will be set in such a way that it is neither too low to produce a profit nor too high to produce any demand. It will be somewhere between these two extremes.

Figure 8.1: Major Considerations in Setting a Price



Source: ICFAI Research Center

8.14.1 Major Considerations in Setting a Price

The above figure 8.1shows the major considerations involved in setting a price. The first consideration is product costs which forms the basis of price. Competitors' prices and the price of substitutes are the middle level considerations that the company has to take into account in setting its price. They help the firm to establish where its prices might be set and the company can use them as an orienting point for its own pricing. The last one, the unique product features in the company's offer establish the ceiling on its price.

Companies solve the problem of pricing by selecting a pricing method that involves one or more of these three considerations. The method will then hopefully lead to a specific price.

8.14.2 Cost plus Pricing

Cost plus pricing is the most common method of pricing. Under this method, the price is determined to cover all the cost and a predetermined percentage of profit. It takes full costs into consideration. Thus, it is also called full cost pricing or cost based pricing.

Illustration 8.15

Let us assume that a new company Feel Good Ltd., has been started. It is planning to start a talcum powder unit. To illustrate how the company sets the price of its product, let us assume that the company has budgeted production of 50,000 units requiring the following costs. If the management desires to have a mark-up of 25% on cost to make and sell, calculation of the target price, that is the price the management will seek in the market place, would be as follows:

Particulars	Total (₹)	Per Unit (₹)
Direct Materials	5,00,000	10.00
Direct Labour	2,00,000	4.00
Variable Overhead	1,50,000	3.00
Fixed Overhead	2,50,000	5.00
Fixed Selling and Administrative Overhead	1,00,000	2.00
Cost to Make and Sell	12,00,000	24.00
Desired Net Income (25% x 12,00,000)	3,00,000	6.00
Target Revenue (Price)	15,00,000	30.00

In the above illustration, the target price was based upon the total cost of the firm. This approach of full-cost based pricing is based upon the fact that in the long run the firm must recover all of its costs plus a normal profit margin, if it is likely to remain in business. So now, in the above illustration, if the market place accepts the price of ₹ 30, the firm will recover all of its costs and then earn the desired amount of profit at a volume of 50,000 units. If the price is too high, compared to the competitors' price, then the actual sales volume would be less than the budgeted volume and the company would fail in achieving its goals. On the other hand, if the price is too low, relative to the competition, the actual sales would exceed the planned volume of sales and because of its low pricing, the company will become a price leader. Of course, this low pricing will have an impact on the profitability of the company. In a competitive market place, the company would be foregoing available profits. In this way, target price represents the first step, trial and error (heuristic) approach to pricing.

The full cost approach to pricing tends to follow a modification of 19th century classical economic theory, which demanded the long run recovery of costs by firms wishing to perpetuate their existence. Most present-day economists maintain that the full cost approach misapplies long run analysis to short-run problems. Nevertheless, "some economists would assign a definite role to full cost in economic doctrine". Moreover, various investigations and statistics say that, "a majority of businessmen set prices on the basis of cost plus a fair percentage of profit". This position can be explained partly by the fact that some concerns, purporting to use the full cost method, actually calculate proposed prices that are subjected to adjustment for demand consideration, competition and market conditions.

Limitations of Cost plus Pricing

Despite its apparently widespread popularity, full-cost pricing has got many limitations. First of all, the use of standard mark-ups to set prices does not make logical sense. It ignores the vital economic considerations of demand and competition. Any pricing method that ignores the above said considerations is not likely to lead to the optimal price. It is prone to distortion by accounting misapplications such as undue reliance upon historical cost, an unjustifiable inclusion of manufacturing overhead based on predetermined rates, and an ignorance of the effect of volume on unit costs and profits.

Cost-based pricing cannot be considered as a rigid, deterministic formula. It is simply one way of determining the target price on the first trial in a trial and error approach. If target price is unacceptable to the buyers in the market, the firm will have no choice but to adjust the selling price or to change their product line.

The illustration discussed above includes only one product. Adopting cost-based pricing as the method of pricing becomes more complex in a multi-product firm, because the total cost per unit of a specific product is the total of the per unit variable cost plus some apportioned or allocated share of fixed costs.

Still mark-up pricing remains popular for varied reasons. First, the sellers have better knowledge of costs than demand. By trying the price to cost, their pricing task is much simplified. They need not have to make frequent adjustments as demand changes. Second, when all the companies in the industry use the same pricing method, then prices tend to be similar thus minimizing price competition which would not be the case if the companies paid attention to demand variations when they priced. Third, cost-plus pricing is fairer to both buyers and sellers. Sellers do not take advantage of buyers when the latter's demand becomes acute. Yet, they earn a fair return on the investment.

Illustration 8.16

A small scale manufacturer produces an article at the operated capacity of 5,000 units while the normal capacity of this plant is 7,000 units. Working at a profit margin of 20% on sale realization, he has formulated his budget as under:

Units / Particulars	5,000 units ₹	7,000 units ₹
Sales realization	1,00,000	1,40,000
Variable overheads	25,000	35,000
Semi-variable overheads	10,000	11,000
Fixed overheads	20,000	20,000

The manufacturer gets an order for a quantity equivalent to 20% of the operated capacity, and even on this, additional production profit margin is desired at the same percentage on sales realization as for production to operated capacity.

Assuming prime cost is constant per unit of production, what should be the minimum price to realize this objective?

Solution

Computation of differential cost of production of 1,000 additional units (₹)

Units	5,000 ₹	6,000 ₹	Differential cost for 1,000 units
Prime cost (see Note a)	25,000	30,000	5,000
Variable overheads	25,000	30,000	5,000
Semi-variable overheads (see Note b)	10,000	10,500	500
Fixed overheads	20,000	20,000	–
Total cost	80,000	90,500	10,500

For an additional output of 1,000 units over the operated capacity of 5,000 units the differential cost is ₹ 10,500 or ₹ 10.50

Profit Margin = 20% on sales or 25% on cost

Minimum selling price = ₹ 10.50 + 25% on ₹.10.50 = 10.5 + 2.625 = ₹ 13.125.

Working Notes:

a. Cost of Sales

= 80% of sales (since profit is 20% on sales)

= 80% of ₹ 1,00,000 = ₹ 80,000

Particulars	₹	₹
Cost of Sales		80,000
Less: Variable overheads	25,000	
Semi variable overheads	10,000	
Fixed overheads	20,000	55,000
Prime Cost		25,000

b. An additional production of 2,000 units will increase ₹ 1,000 in semi variable overheads. Hence, additional production of 1,000 units will increase ₹ 500 in semi variable overheads.

Illustration 8.17

An institute for correspondence studies teaches wholly through the correspondence method using self-study packs, which enable students to prepare for professional qualifications.

Each course of study was sold at the price of ₹ 150 last year and a total of 10,000 units were produced and sold. The production costs of the various courses offered by the institute are the same.

The variable cost of producing a study course last year was:

Direct materials ₹ 50; Direct labor ₹ 60; other direct costs (postage) ₹ 6, and variable overheads ₹ 4.

The fixed overhead for the institute during the year was ₹ 2,00,000. During the coming year the costs of the organization are expected to increase by the following:

Direct material 20%; direct labor 16.67%; other direct costs 67%; variable overheads 25%, and fixed overhead 5%.

For the coming year you are required to find out the selling price of the study courses if the number of study courses sold and the annual profits are to remain as before.

Solution

Last year's selling price = ₹ 150;

Total variable cost = ₹ 120

Therefore, contribution per unit = ₹ 150 – ₹ 120 = ₹ 30

Profit = Contribution – Fixed cost

= 10,000 x 30 – 2,00,000 = ₹ 1,00,000

New Variable Costs

Particulars		₹
Material	(50 x 1.2)	60.00
Labor	(60 x 1.1567)	70.00
Other direct costs	(6 x 1.67)	10.00
Variable overhead	(4 x 1.25)	5.00
Total		145.00

New contribution = Profit + Fixed cost

= ₹ 1,00,000 + (2,00,000 x 1.05) = ₹ 3,10,000

Contribution per unit = ₹ 3,10,000/10,000 = ₹ 31 per unit

Therefore, Selling price = Variable cost + Contribution

= ₹ 145 + ₹ 31 = ₹ 176

8.14.3 Return on Investment Pricing

Under full-cost pricing, the normal mark-up was based on the total cost. So, obviously, this method of pricing does not recognize capital investment in determining proposed selling price. Yet, the return on capital required to produce, finance and distribute products is widely recognized as crucial index of managerial efficiency. Consequently, management can aid its performance by knowing what selling price would provide a given rate of return on investment.

To illustrate how this practical approach to the determination of the normal mark-up on price as a certain rate of Return On Investment (ROI), let us consider the previous illustration dealt in the full-cost pricing method. Assume the company brings in a capital of ₹ 20 lakh and the cost of raising its capital is 15%. The calculation of proposed price would be as follows:

Particulars	Total (₹)	Per Unit (₹)
Total costs of make and sell	12,00,000	24.00
Mark-up (15% x 20,00,000)	3,00,000	6.00
Proposed selling price	15,00,000	30.00

Even this method does not speak about the allocation or apportionment of fixed cost, but the advantage that ROI pricing has over cost-plus pricing is that the mark-up for net income has a definite methodology. Besides that, this method furnishes an excellent analytical tool for appraising alternative selling prices. Not only does it guide management in determining what selling price will provide a given rate of return, but it may be used to show what rate of return a given price will bring.

Illustration 8.18

A company has furnished the following cost data:

Particulars	
Direct material	₹ 7.50
Direct wages	₹ 6.00
Variable overheads	₹ 1.50
Fixed factory overheads	₹ 13,00,000 p.a.
Fixed selling and administration overhead	₹ 7,50,000 p.a.
Capital employed on fixed assets	₹ 20,00,000
Annual sales	8,00,000 units

Capital employed in current assets is 50% of sales. Determine the selling price per unit to yield 20% return on capital employed.

Solution

Let the selling price per unit be x

Capital employed = Fixed assets + Current assets

= ₹ 20,00,000 + 50% of 8,00,000x

= ₹ 20,00,000 + 4,00,000x

Profit = 20% on capital employed

= 20% (₹ 20,00,000 + 4,00,000x)

= ₹ 4,00,000 + 80,000x

Cost = Variable Cost + Fixed Cost

= 15 x 8,00,000 + 20,50,000

= ₹ 1,20,00,000 + 20,50,000 = ₹ 1,40,50,000

Sales = Cost + Profit

8,00,000x = ₹ 1,40,50,000 + ₹ 4,00,000 + 80,000x

7,20,000 x = 1,44,50,000

x = 1,44,50,000/7,20,000 = ₹ 20.06 or ₹ 20

Selling price per unit = ₹ 20

8.14.4 Contribution-Margin Approach to Pricing

Contribution Approach pricing is also a cost-plus type of pricing. The difference between the variable cost and revenue related to any given quantity of products is called Contribution Margin. The term measures the contribution these products make towards meeting period costs and desired profit. In contribution approach pricing models also, only variable costs are used as the basis of pricing. The pricing model is concerned only with the costs that vary with the product or service being priced. Allocation or apportionment of fixed cost to product or service is ignored in this approach to pricing.

To illustrate how pricing issue is solved through contribution approach model, let us assume the following variable cost data that relates to an imaginary company FDP Ltd., a single product company which manufactures TV boosters.

Resource	Unit Variable Cost (₹)
Direct Materials	120
Direct Labour	40
Variable Overhead	15
Variable Selling and Administrative Overhead	5
Total Variable Cost	180

Selling price equals variable costs plus 75 per cent. So, the selling price of the product is ₹ (180 + 75% x 180) = ₹ 180 + 135) = ₹ 315.

The above illustration totally ignores the fixed cost in pricing the product. Although fixed costs are not assigned to cost objectives under the contribution approach, they must be taken into consideration in determining the mark-up to be added to the variable cost to arrive at the target selling price. The mark-up is added in such a way that it provides enough revenue to cover all of the fixed costs and still provide a satisfactory profit.

The contributions approach is appealing for a variety of reasons. The managers can easily visualize the relationship between prices and costs that vary directly with sales. Variable cost data is available readily as they are used in segmental contribution reports and variable costing income statements. The complications of fixed cost allocation can be avoided with the contribution approach.

In addition to serving as a potential cost base for establishing the price of new and standard products, the contribution margin approach is an excellent analytical tool in a number of other pricing decisions. This approach uses the incremental view that the only costs relevant to pricing decisions are those costs that would be avoided if the sales order were not accepted. Contribution margin approach leads directly into the study of cost, volume, profit and revenue interactions. Since competition and customer demand also enter the pricing decision, selling prices hardly have a constant relationship to product cost. The net income depends upon a combination of price, volume, sales mix and cost structures. Thus, the contribution margin pricing approach allows management a rapid way of assessing the sensitivity of volume and price interactions.

A word of warning about the role of the contribution approach in pricing seems appropriate at this point. There is always the danger that the use of the contribution margin could lead to short-term underpricing and that, as a result, the long run financial health of the company would be affected. However, if the information available in the contribution margin approach is used in cost-volume-profit analysis, there is no reason for the short run attitude to dominate.

8.14.5 Relationship between Full Cost and Contribution Margin Pricing

Although the full cost pricing and contribution-margin based approach for pricing are considered as distinctively different approaches, by and large, they represent to a certain degree, cost plus type pricing. They can be considered complementary to each other but not competing. Fixed costs are important in both the pricing models. But in contribution margin pricing, they are treated in a different manner than in the full-cost pricing method. Full-cost pricing makes a normal mark-up on total costs and it does not take volume of production into consideration. On the other hand, contribution margin approach to pricing is concerned about cost, volume and profit and makes cost-volume-profit analysis. But in both the methods, the selling prices proposed must be only tentative as they are always subjected to adjustments.

8.14.6 Differential Cost Pricing

Under full-cost pricing, a selling price is proposed for all units produced at any given level of activity. It is designed to recover both fixed and variable costs in a proposed product price. The full-cost pricing ignores the above fact and as a result, the proposed selling price calculated for the additional units may be unnecessarily inflated.

The recognition of differential cost on incremental cost pricing makes it possible to overcome the above said limitation of full-cost pricing. Since differential costs equal variable cost per unit times the number of units of additional production plus the new fixed costs that may be incurred, it is necessary to have a clear delineation between fixed costs and variable costs.

Exhibit 8.1 gives the insight into differential pricing technique adopted by Pfizer in its pricing of COVID-19 Vaccine.

Exhibit 8.1: Pfizer's Differential Pricing Strategy for COVID -19 Vaccine

Pfizer is an American Pharmaceutical company that also participated in the COVID-19 vaccine development process. Its vaccine is called the Pfizer–BioNTech COVID-19 vaccine and is sold under the brand name 'Comirnaty'. In December, 2020, the company released a statement saying that it has followed a differential pricing strategy and the vaccine will be priced differently in different countries. Termed as 'tier pricing', the company will have one price for the developed markets but another lower price for the middle-income and low-income countries, where the company will distribute it at a price which is non-profit making.

Source: Livemint. Covid 19 vaccine to have differential pricing for different countries: Pfizer. December, 2020. https://www.livemint.com/science/health/covid-19-vaccine-to-have-differential-pricing-for-different-countries-pfizer-11607521199878.html

Let us consider the following data to illustrate differential cost analysis.

Illustration 8.19

The data given below relates to the assumed facts for product Q by a company.

Product Q
Assumptions

Practical Capacity	15,000 direct labor hours			
Budgeted Capacity	12,000 direct labor hours = 12,000 x 2 = 24,000 units			
Units produced/D.L. hour		2 units		
Estimated Variable Costs	₹	Total ₹	₹	per unit ₹
Direct Material		1,92,000		8.00
Direct Labor (₹ 4 per hour)		48,000		2.00
Manufacturing Overhead				
Fixed	1,20,000		5.00	
Variable	24,000	1,44,000	1.00	6.00
Selling and Administrative				
Fixed	96,000		4.00	
Variable	24,000	1,20,000	1.00	5.00
		5,04,000		21.00

We also assume that the fixed costs are to remain unchanged within the range of 90 to 120 percent of budgeted activity.

Solution

The analysis of differential costs is shown below.

Differential Cost Analysis

Percentage of Budgeted Capacity	90%	100%	110%	120%
Level of Activity in Units	21,600	24,000	26,400	28,800
Total Variable Costs	2,59,200	2,88,000	3,16,800	3,45,600
Fixed Costs	2,16,000	2,16,000	2,16,000	2,16,000
Total Costs	4,75,200	5,04,000	5,32,800	5,61,600
Average Unit Differential Cost	12.00	12.00	12.00	12.00
Average Unit Cost	22.00	21.00	20.18	19.50
Average Unit Cost Change	1.00	0.82	0.68	

In the above illustration, since the fixed cost does not change over the change in level of activity, only the variable costs account for the difference in total costs between any two levels of activity. In each instance, the average unit differential cost is computed by dividing the increase in variable costs by the number of additional units produced. It is evident from the above that although the average unit cost ranges from ₹ 22.00 to ₹ 19.50, the average unit differential cost stays at ₹ 12.00 whenever additional units are produced.

It follows that, if 21,600 units can be profitably disposed off at a unit price in excess of ₹ 22.00, the sale of additional units at any unit price in excess of ₹ 12.00 will increase profits when the overall marketing conditions remain stable. The problem is now for holding the original market intact and looking for the outlet for the additional production. Perhaps, the solution may be found by using differential cost analysis to guide the decision on the desirability of bidding for added production.

Advantages of Differential Cost Pricing

The differential cost analysis furnishes an excellent tool for pricing and provides useful information for profit planning when the entire productive output can be disposed off in a single market. To support this point, just take the illustration given above. In that, we need only to point out that the average unit cost change indicates the amount by which the unit price may be reduced to yield increased sales volume, while still permitting the earning of same profit on each unit sold. Under such conditions, profits will increase by an amount equal to the unit profit margin multiplied by the additional units to be sold. For instance, assume that 21,600 units can be sold for ₹ 30 per unit. If the indicated price reduction of ₹ 1.00 will permit 24,000 units to be sold at ₹ 29 each, the increase in total profits will be ₹ 19,200 which is obtained by multiplying the constant unit profit margin of ₹ 8.00 with 2,400 additional units.

Another advantage of differential cost analysis is that it is related closely to economic marginal analysis. As the economist maintains that to maximize income, a firm should produce at the point where the marginal revenue equals marginal cost, in differential cost analysis, the accountant reasons that the firm should produce at the point where differential costs equal differential income.

Even though differential costs render many benefits in guiding pricing policies, indiscriminate reliance upon this method can be dangerous. For example, it could bring about pricing decisions that tend to disregard the necessity of recovering total costs in the long run. Moreover special price reduction could have unfavorable repercussions on regular customers or impel competitors to take similar action.

To summarize, differential cost accounting can help management in taking price decisions, but does not replace judgment.

Illustration 8.20

DAR Ltd., has a budget to make 1,50,000 units of a product. The variable cost per unit is ₹ 15. Fixed costs are ₹ 13,50,000. The finance director has suggested that the cost plus approach should be used with a profit mark-up of 25%. However, the marketing director disagreed and has supplied the following information:

Price per unit (₹)	Demand (Units)
27	1,26,000
30	91,200
33	1,05,000
36	96,000
39	81,000

As a management accountant of the company, analyze the above proposals and comment.

Solution

a. Finance Director's Cost Plus Approach

According to this approach the selling price of the product will be as under:

Particulars	₹
Variable cost	15.00
Fixed cost per unit	9.00
Total cost	24.00
Profit (25% of cost)	6.00
Selling price	30.00

At a selling price of ₹ 30 per unit, the total sales will be 91,200 units.

The total profit will be as under:

Particulars	₹
Contribution (91,200 x ₹ 15)	13,68,000
Less: Fixed cost	13,50,000
Total profit	18,000

b. Marketing Director's Approach

According to this approach, the profit at different selling prices will be as under:

Price/ Unit	Contribution/ Unit	Units Demanded	Total Contribution (₹)	Fixed Cost (₹)	Net Profit (₹)
₹ 27	₹ 12	1,26,000	15,12,000	(13,50,000)	1,62,000
₹ 30	₹ 15	91,200	13,68,000	(13,50,000)	18,000
₹ 33	₹ 18	1,05,000	18,90,000	(13,50,000)	5,40,000
₹ 36	₹ 21	96,000	20,16,000	(13,50,000)	6,66,000
₹ 39	₹ 24	81,000	19,44,000	(13,50,000)	5,94,000

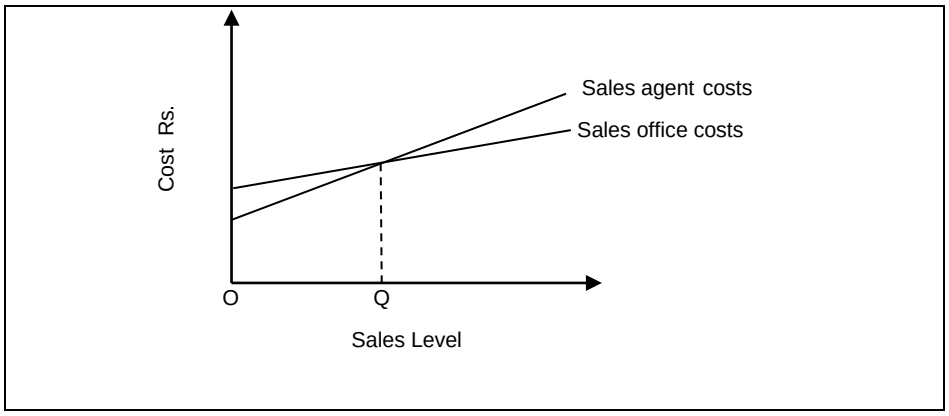
The above table shows that the marketing director's approach is correct and ₹ 30 per unit is not the best price. The best price is ₹ 36 per unit, which gives maximum profit.

8.15 Selling Agents vs. Sales Force

The distribution decisions in a marketing mix are about getting the products to the customer. Some examples are decision on distribution channels, warehousing, distribution centers, marketing coverage etc. One of the frequently required decisions is to employ sales agents or establish one's own sales force.

Sales agent versus Sales force is one of the most important decisions for the marketing managers. The economic criteria can be evaluated by means of a break-even chart for choosing a channel of distribution (i.e., selling agents or sales force). In the following figure the choice between having sales agents and establishing a branch sales office is depicted. If selling agents are employed, the level of fixed costs is less but the variable cost (i.e., commission) is higher. If branch is established, the level of fixed cost is more (i.e., rent, salaries etc.) and the variable cost is less compared to the other option. If the level of sales is expected to be below the point Q on the horizontal scale, then selling through sales agents is preferable; otherwise a branch office is to be preferred.

Figure 8.2: Break-even Chart for Sales Agents vs. Sales Force



Source: ICFAI Research Center

Illustration 8.21

ABC Ltd., manufactures a range of products, which it sells through the manufacturer's agents to whom it pays commission of 20% of the selling price of the products. Its budgeted profit and loss statement for 20xx is as follows:

Particulars	Amount (₹)	Amount (₹)
Sales		11,25,000
Less: Prime costs and variable overhead	3,93,750	
Fixed overhead	1,81,250	5,75,000
		5,50,000
Selling Costs:		
Commission to manufacturer's agents	2,25,000	
Sales office expenses (fixed)	10,000	2,35,000
		3,15,000
Administrative costs (fixed)		1,50,000
Profits		1,65,000

Subsequent to the preparation of the above budgeted profit and loss statement, the company is faced with a demand from its agents for an increase in their commission to 22% of selling price. As a result, the company is considering whether it might achieve more favorable results if it were to discontinue the use of manufacturer's agents and instead employ its own sales force. The costs this could involve are budgeted as follows:

Particulars		Amount (₹)
Sales manager	(Salary and expenses)	37,500
Salesmen expenses	(Including traveling costs)	10,000
Sales office costs	(Additional to present costs)	25,000
Interest and depreciation on sales department cars		17,500

In addition to the above, it will be necessary to hire four salesmen at a salary of ₹ 20,000 per annum each plus commission of 5% on sale plus car allowance of ₹ 1 per kilometer to cover all costs except interest and depreciation.

On the assumption that the company decides to employ its own sales force on the above terms, you are required to ascertain the maximum average kilometer per annum that salesman could travel if the company is to achieve the same budgeted profit as it would have obtained by retaining the manufacturer's agents and granting them the increased commission they had requested. Assume that sales in each case would be as budgeted.

Solution

Calculation of Economies of Employing Company's Own Sales Force

Particulars	Amount (₹)	Amount (₹)
Savings in existing commission	(20% of Sales)	2,25,000
Saving in proposed increase in commission	(2% of Sales)	22,500
Total Savings in Commission (i)		2,47,500
Additional Costs: (excluding car allowance)		
Commission	(5% of Sales)	56,250
Sales manager	(Salary and expenses)	37,500
Salesmen's expenses		10,000
Sales office costs		25,000
Interest and depreciation on sales department cars		17,500
Salesmen's salary	(4 x ₹.20,000)	80,000
Total Costs (ii)		2,26,250
Net savings prior to paying car allowance		21,250

The above calculations show that there would be net saving (excluding salesmen's car allowance) to achieve the same budgeted profit as company would have obtained by retaining the manufacturer's agents and granting them increased commission. Since the car allowance of salesmen is ₹ 1 per km., the maximum total kilometers to be traveled by all the salesmen would amount to ₹ 21,250. The number of salesmen being 4 the maximum average kilometers per sales men would amount to ₹ 5,312 (i.e., 21,250/4).

8.16 Target Costing

As a totally new product and its industry develop, it starts to compete based on its new technology, concept, and/or service. Competitors emerge and the basis for competition covers other areas such as cycle time, quality or reliability. As the industry becomes mature, the basis of competition typically moves to price.

Profit margins shrink. Companies begin focusing on cost reduction. However, the cost structure for existing products is largely locked in and cost reduction activities have limited impact.

As companies begin to realize that the majority of a product's costs are committed, based on decisions made during the development of a product, the focus shifts to actions that can be taken during the product development phase.

Until recently, engineers have focused on satisfying a customer's requirements. Most development personnel have viewed a product's cost as a dependent variable that is the result of the decisions made about a product's function, features and performance capabilities. Because a product's costs are often not assessed until later in the development cycle, it is common for product costs to be higher than desired.

The long-term financial success of any business depends on whether its prices exceed its costs and are adequate to finance growth, provide for reinvestment, and yield a satisfactory return to its stakeholders. As competition increases, and supply exceeds demand, market forces influence prices significantly. To achieve a sufficient margin over its costs, a company must manage those costs relative to the prices the market allows or the price the firm sets to achieve certain market penetration objectives. In the context of these characteristics, the practice of target costing has evolved. Effective management of cost makes an organization more strong, more stable and helps in improving the potential of a business. The organization calls for a system that would monitor the full economic impact of the business, on resource acquisition and consumption.

Target costing is defined as "a cost management tool for reducing the overall cost of a product over its entire life cycle with the help of the production, engineering, R&D." Target costing process starts with determining market-based prices based on market and competitive conditions and then subtract the required margin to determine the product or service level target costs. Such aggregate level target costs can be useful in designing value delivery processes and determining the relative cost contribution of people, process and technology elements in a manner that achieves target cost before costs are incurred.

Target costing is fundamentally a different approach. It is based on three premises:

(i) orienting products to customer affordability or market-driven pricing, (ii) treating product cost as an independent variable during the definition of a product's requirements, and (iii) proactively working to achieve target cost during product and process development. It is a profit and cost management system that helps a company to achieve market and financial success by planning the portfolio of services, and designing the products, processes and related cost structures that provide value to customers.

Exhibit 8.2 discusses the new approaches to target costing

Exhibit 8.2: New approaches to Target Costing

Deloitte article on "target costing in disruptive times" highlights the need to adopt target cost control in development projects as such projects face challenges such as:

- Diverse types of product features and versions
- Reduced cycles for development
- Emerging new business service models
- Isolated data silos
- Need for greater integration of softwares
- New laws and regulations

In order to face these challenges, the article proposes a "next level target costing approach" with features such as:

1. Target setting by aligning the top-down and bottom-up targets
2. Outside-in-view that applies outside information to validate cost targets, cost decisions and forecasts
3. Cross functional governance – Enables a cross functional view in setting targets
4. Value focus – Focusing on the high value parts/divisions etc
5. Lean steering mechanism – setting higher standards and ensuing effective control
6. Common data and language – Using big data and analytics to support the target costing process.

The next level target costing approach is beneficial as it provides increased cost transparency, effective controlling, integration of cost data leading to increased efficiency.

Source: Nikolas Helbig. Target Costing in Disruptive Times. Deloitte, 2021 https://www2.deloitte.com/de/de/pages/operations/articles/target-costing-in-disruptive-times.html

Target costing is a customer-oriented technique that is widely used by Japanese companies and which has also been adopted by companies in Europe and the US. The target costing process is a logical outgrowth of determining the causes of cost and seeking ways to reduce or eliminate those costs before production costs were incurred, while simultaneously looking to improve quality and customer satisfaction.

Illustration 8.22

Anuradha Enterprises has prepared a draft budget for the next year as follows:

Quantity	20,000 units
Sales price per unit	30
Variable cost per unit: Direct material	8
Direct labour (2 hours x ₹ 3)	6
Variable overhead	1
Contribution per unit	15
Budgeted contribution	3,00,000
Budgeted fixed costs	2,80,000
Budgeted profit	20,000

The board of directors is dissatisfied with this budget, and asks a working party to come up with an alternative budget with higher profit figures.

The working party reports back with the following suggestions that will lead to a budgeted profit of ₹ 50,000. The company should spend ₹ 54,000 on advertising, and put the sales price up to ₹ 32 per unit. It is expected that the sales volume will also rise, in spite of the price rise, to 24,000 units.

In order to achieve the extra production capacity, however, the work force must be able to reduce the time taken to make each unit of the product. It is proposed to offer a pay and productivity deal in which the wage rate per hour is increased to ₹ 4.

Ascertain the revised labour time required to achieve the target profit.

Solution

Particulars	₹	₹
Budgeted Fixed Costs		2,80,000
Additional expenditure on advertising		54, 000
Total revised fixed cost	2,80,000 + 54,000	3,34,000
Target profit		50,000
Required contribution to achieve a profit of ₹ 50,000	3,34,000 + 50,000	3,84,000
Expected sales in units		24,000 units
Required contribution per unit	3,84,000/24,000	16 per unit

Target Variable cost per unit = Target price – Required contribution per unit

= ₹ 32 – ₹ 16 = ₹ 16

Target Labor cost per unit = Target Variable cost per unit – (Direct Material and Overhead cost)

= ₹ 16 – (₹ 8 + ₹ 1) = ₹ 7 per unit

Wage rate per hour = ₹.4

Number of labor hours required per unit = ₹ 7/₹ 4 = 1.75 hours.

Therefore, the work force should be able to reduce the time taken to make each unit of the product from 3 hours to 1.75 hours.

Check Your Progress - 2

6. Which of the following factors need to be considered in a make or buy decision?
   a. The capability of the company to make the item in terms of capacity.
   b. The availability of outside suppliers who can deliver the same in terms of quantity, time and quality.
   c. The opportunity cost of using existing capacity to manufacture alternative items, which would make a greater contribution.
   d. The differential cost of making and buying the item.
   e. The capability to make the item, availability of suppliers , the opportunity cost and differential cost involved in making the item.
7. While deciding about replacement of capital equipment, the firm should take into consideration
   a. The resultant savings in operating costs.
   b. The incremental investment in the new equipment
   c. The benefits the firm is likely to derive in the long run
   d. The incremental investment and the benefits the firm is likely to derive in the long run.
   e. The resultant savings, incremental investment and the benefits the firm is likely to derive.
8. Which of the following is not a pricing model?
   a. Fixed cost based pricing
   b. Full cost based pricing
   c. Return on investment pricing
   d. Marginal cost based pricing
   e. Differential cost based pricing
9. Which of the following pricing method is generally followed by government organizations?
   a. Fixed cost based pricing
   b. Full cost based pricing
   c. Return on investment pricing
   d. Marginal cost based pricing
   e. Differential cost based pricing

10. Which of the following refers to a cost management tool that reduces the overall cost of a product during its entire life cycle by using production, engineering and R&D?

    a. Differential Costing
    b. Target Costing
    c. Marginal Costing
    d. Unit Costing
    e. Process Costing

Activity 8.2

A company XYZ Ltd., has the production capacity of 1,00,000 units and currently selling 40,000 units at ₹ 100 per unit. The demand can make fluctuations in the selling prices. It has been observed that demand increases in two folds with every reduction of ₹ 10 in selling price. Find out the target cost at full capacity if profit margin on sales is taken as 30%.

8.17 Summary

- Decision-making is an integral part of all management functions. It is the process of choosing among alternative courses of action. Managers have to spend a considerable amount of time and thought in making decisions.
- Costs, which affect the managerial decisions, are called relevant costs. All types of costs are not relevant. Only the costs, which are futuristic in nature and differ among alternatives, are considered as relevant costs.
- Differential cost analysis or differential costing is a special technique to help management take decision. It shows how costs and revenues would be different under different alternative courses of action.
- With the help of techniques like marginal costing, CVP analysis and differential analysis, the management makes decisions like determination of profitable levels of production, whether to make or purchase, to process or sell, to purchase or lease, to accept or reject new orders etc.
- Marketing refers to the promotion of products, especially advertising and branding. But marketing includes product management, pricing, promotion and distribution of a product or a service.

- Under normal circumstances, the prices are based upon total cost of sales so as to cover both fixed as well as variable costs and, in addition, to provide for certain desired margin of profit. Sometimes it may become necessary to reduce the selling prices to the level of marginal cost or even below the marginal cost.
- Target cost is the estimated cost of a product that enables a company to remain and compete in the market in the long run. Target costing is a method of costing which is intended to reduce cost, where such reduction is aimed at the entire life cycle of any product.

8.18 Glossary

Contribution is the excess of selling price over variable costs. It represent the surplus that can be used to cover fixed costs.

Cost Plus Pricing is a pricing method in which a predetermined markup is applied to a cost base to determine the target-selling price.

Decision-making is the process of choosing between alternative courses of action.

Decremental Cost is decrease in relevant cost as a result of decision.

Differential Cost is any cost that differs between alternatives in a decision-making situation.

Differential Revenue is the difference in revenue between any two alternatives.

Incremental Cost is increase in cost as a result of decision in addition to the relevant cost.

Incremental Profit is difference between the incremental revenue and incremental cost.

Incremental Revenue is increase in revenue as a result of decision in addition to the regular income.

Irrelevant costs are those costs which will not be affected by any decision made by the management.

Marginal Costing is a method of costing that deals with decision making on the basis of marginal or variable costs. Under marginal costing, all the costs are segregated into variable costs, fixed costs and semi-variable or semi-fixed costs. Decisions are taken by ascertaining contribution.

Margin of Safety represents the difference between the sales at break-even point and the total sales. It can be expressed as a percentage as well as in value. The size of the margin of the safety shows the strength of the business.

Opportunity Cost is the gain foregone by giving up the next best alternative.

Pricing is the process of determination of selling price for a product or service produced in the organization.

Relevant Costs are costs which are relevant for decision-making or which have considerable effect on decision.

Return on Investment Pricing aids management in ascertaining its performance by knowing what selling price would provide a given rate of return on investment.

Target Costing is a customer-oriented technique that is widely used by Japanese companies. The target costing process is a logical outgrowth of determining the causes of cost and seeking ways to reduce or eliminate those costs before production costs were incurred, while simultaneously looking to improve quality and customer satisfaction.

8.19 Self-Assessment Test

1. Explain various steps in the decision-making process.
2. Briefly explain the various types of decisions taken by the management with the help of differential cost analysis.
3. What is relevant cost? Explain its characteristics.
4. 'Costs are the base for pricing decisions.' Explain the role of costs in pricing decisions.
5. Discuss any three methods of pricing a product.

8.20 Suggested Readings/Reference Material

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8.21 Answers to Check Your Progress Questions

1. (e) Potential effect of the cost on the decision

The relevant costs are given the utmost importance in managerial decision-making. Their magnitude will affect a decision being made.

2. (e) Sunk Cost

A sunk cost is an expenditure made in the past that cannot be changed. These are past costs not future costs. Thus these costs are not relevant for decision-making.

3. (b) It is a future cost

In management accounting, differential cost is used as a synonym to relevant cost. This can be defined as the change in the cost due to change in the level of activity or pattern or method of production. It is a future cost and does not include all variable costs.

4. (c) Out-of-Pocket costs

There are certain costs, which require cash payment to be made (like salaries and wages, rent) whereas many costs do not require cash outlay (like depreciation). Out-of-pocket costs involve cash outlays or require the utilization of current resources.

5. (e) Both techniques are used for long-term decision-making

While differential costing can be used for short-term and long-term decision-making, marginal costing is used for short-term and medium term decision making.

6. (e) The capability to make the item, availability of suppliers, the opportunity cost and differential cost involved in making the item.

Make or buy decision is important for any company. So, before taking any decision one should consider certain things as:

- The capacity of the company in terms of people, plant, space etc., to achieve the required quantity and quality.
- The differential cost of making or buying the item.
- The opportunity cost of using existing capacity to manufacture alternative items.
- The level of variable overheads, which are charged to the item.

7. (e) The resultant savings, incremental investment and the benefits the firm is likely to derive.

In case of capital investment decision, the company management will consider two alternatives: (a) whether the asset should be purchased, or (b) it should be leased. For the decision-making purpose, the total cost of the two alternatives will be compared to know the additional savings.

8. (a) Fixed cost based pricing

The pricing methods are cost plus pricing, contribution margin pricing, return on investment pricing, full cost pricing and differential cost pricing

9. (b) Full cost based pricing

Government organizations usually follow full cost pricing method. Under this method, the price is determined to cover all the cost and a predetermined percentage of profit. It takes full costs into consideration. It is also referred to as cost plus pricing method.

10. (b) Target Costing

Target costing is defined as “a cost management tool for reducing the overall cost of a product over its entire life cycle with the help of the production, engineering, R&D.”

Foundations of Accounting & Finance

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