

# **Cost and Financial Management for Hotels**

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**Tata McGraw-Hill**

Published by the Tata McGraw Hill Education Private Limited,  
7 West Patel Nagar, New Delhi 110 008.

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This edition can be exported from India only by the publishers,  
Tata McGraw Hill Education Private Limited.

ISBN (13 digit): 978-1-25-900495-7

ISBN (10 digit): 1-25-900495-3

Vice President and Managing Director: *Ajay Shukla*

Head—Higher Education Publishing and Marketing: *Vibha Mahajan*

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Typeset at Tej Composers, WZ 391, Madipur, New Delhi 110 063 and printed at

Cover Printer:

# Foreword

The book titled *Cost and Financial Management for Hotels*, authored by Mr. Prasanna Kumar J.P., Ms. Linda Daniel and Mr. Mruthyunjaya V. Pagad, is a comprehensive account of the vast experience of three professionals covering costing and financial management related to the hospitality industry.

I genuinely feel that the book provides a precise and lucid treatment of the basic principles of cost and financial management supported by a number of objective type and review questions. Worked out illustrations as well as exercises related to hospitality industry given in this book will definitely help students understand how and why of financial management specific to the hotel industry.

I am confident that this book shall provide the requisite help to students of Hospitality and Tourism to understand the concept of cost and financial management.

I am sure that professionals and scholars also will find this work quite useful.

**Dr. Shaji Thomas**

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# Preface

Hospitality and Tourism Management as a profession/career is gaining its significance all over the world, especially in India in this millennium. Though there are many books on ‘costing and financial management’, they are suitable for commerce or general management courses and are found to be very exhaustive. The students of Hospitality Management face the difficulty of getting their hands on to one book where they can get material that covers their syllabus. The book, *Cost and Financial Management for Hotels*, is an effort in this context to provide the students of Hospitality and Tourism Management to have one stop reference material for the paper on cost and financial management. While compiling this book, an attempt is made to cover the syllabi of most of the Indian Universities and Institute of Hotel Management under NCHMCT. This book will definitely be handy for all those who are practicing cost and financial management in the hospitality industry, both academically and professionally.

The book covers the topics such as hotel costing and hotel cost sheet, food/ingredient costing, menu costing/pricing, banquet costing, hotel cost ledgers, hotel operating ratios, etc. Every chapter ends with objective type questions and review questions to develop skills in financial management.

All efforts have been made to bridge the gap between available resources and the future requirements by providing necessary inputs and make the book more user-friendly. However, one may still find some loopholes. We request our readers to feel free in criticizing the contents wherever necessary and correcting us in this regard.

## Acknowledgements

We take this opportunity to thank ALMIGHTY and express our gratefulness to our parents and teachers and all our well-wishers who have guided us unconditionally in our life.

We would like to convey our sincere thanks to our principal, Mr. Abby Mathew, who has given us the opportunity to work on this book along with our other academic and administrative assignments.

It is significant to mention and thank Mr. Sanjeev Kadkade (Institute of Hotel Management, Goa) who helped us in compiling the syllabus of various universities and councils. We also express our gratitude to Dr. Shaji Thomas for his encouragement and support.

It'd be a failing in our part if we don't thank Mr. A. Srinivasan, Mr. Tapas K Maji, Mr. Atul Gupta, Ms. Piyali Ganguly, Mr. Amit Kumar and Mr. Yogesh Kumar from Tata McGraw Hill

Education, with whom we had direct interactions regarding this project and have contributed significantly towards the final outcome of this book.

Last but not the least we take this opportunity to thank our spouses and children who accommodated us with their love, affection and encouragement, while we were too busy during the hectic schedule of preparing the manuscript.

**Prasanna Kumar J.P.**

**Linda Nalini Daniel**

**Mruthyunjaya V. Pagad**

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## **PART**

# **1**

# **Hotel Costing**

1. Introduction to Hotel Costing
2. Hotel Cost Sheet
3. Inventory Management
4. Menu Costing/Pricing
5. Break-even (or cost-volume-profit) Analysis
6. Budgets
7. Hotel Cost Ledgers
8. Standard Costing



# 1

## Chapter

# Introduction to Hotel Costing

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of costing, cost accounting and cost accountancy
- Need and advantages of costing
- Meaning of cost unit and cost centre
- Different methods of costing
- Difference between cost accounting and financial accounting
- Various elements of cost and classification of cost
- Expenses not included in cost accounts

### **COSTING, COST ACCOUNTING AND COST ACCOUNTANCY**

Costing refers to the technique and process of ascertaining cost of a product or service. It involves two steps:

- (a) Collection and classification of costs according to their nature
- (b) Allocation and apportionment of costs to different products or services.

The Terminology of Cost Accountancy defines the term **costing** as “the techniques and process of ascertaining cost”.

The Terminology of Cost Accountancy defines the term **Cost Accounting** as “the process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest range, it embraces preparation of statistical data, the application of cost control methods, and the ascertainment of the profitability of activities carried out or planned.”



The Terminology of Cost Accountancy defines **Cost Accountancy** 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 for the purpose of managerial decision-making.”

In general, **costing** may be defined as classifying, recording and appropriate allocation of expenses for determining the cost of products or services and the presentation of suitably managed data for the purpose of control and guidance of the management.

In the case of hotel industry, it deals with cost of production and cost of selling and distribution. Food costing means such an analysis of information as to enable the management to know the cost of producing and selling, i.e. the total cost of various products and services, and also to know how the total cost of production is constituted.

## **NEED FOR COSTING**

The purpose of costing is mainly threefold:

### **Cost Ascertainment**

Costing is required to provide an estimated cost for a product both in its finished state and as work-in-progress. This helps in assigning a value to goods held in stock. The other important use is price fixation for the product because normally the price fixed by any business concern for its product cannot be lower than the cost of production.

### **Cost Control**

In these days of intensive competition, it is essential that the business unit keeps a constant vigilance over the costs so as to have an edge over the competitors. The cost control consists in setting up plans, monitoring the actual results and examining the variance and taking action to remedy the situation where required.

### **Decision-making**

There are a number of financial decisions which need to be taken by the management for which cost data are required. For instance, the management has to decide between the alternative uses to which a scarce may be put. Similarly, decisions on investing in capital equipment, changing the volume of production, introduction of a new product all require cost data.

## **ADVANTAGES OF COSTING**

A good system of costing has the following advantages:

- (a) Profitable and unprofitable activities are disclosed.
- (b) Costing enables a concern to measure the efficiency and then to maintain and improve it.
- (c) It provides such information upon which estimates and tenders may be based.

- (d) It reveals losses or inefficiencies occurring in any form.
- (e) Costing guides future production policies.
- (f) An efficient check is provided on materials, labour, and machines.
- (g) It provides a perpetual inventory system.
- (h) It helps in controlling the cost.
- (i) The exact cause of a decrease or an increase in profit or loss can be detected.
- (j) It helps the management to take vital management decisions such as price fixing (for example, meals, dishes, portion, etc.), make or buy, exploration of additional market, problem of key factor, etc.
- (k) It provides the use of budgets and standards to assist management in making estimates and plans for future.
- (l) It discloses relative efficiencies and inefficiencies of different workers.
- (m) It enables the investors and outsiders to judge the financial strength and creditworthiness of the business.
- (n) The ultimate aim of costing is to reduce cost of production to the minimum and maximize the profits of the business.
- (o) Costing system helps the government, wage boards, etc. in providing data for price fixation and price control, wage fixation, etc.

Unlike the ordinary trading business, in food and beverage establishment, many factors are to be considered in the cost of production of a saleable finished product by way of raw materials, such as stores consumed, productive and non-productive labour, direct expenses, management cost, selling and distribution charges, etc. to ascertain the true cost of the product/service. A sound system of food and beverage costing is a must for better ascertainment, apportionment, and control of cost.

## **COST UNIT**

The Terminology defines a cost unit as “a unit of product, service, or time (or a combination of these), in relation to which costs may be ascertained or expressed.” Cost units relate particularly to the units in which products and services are expressed. E.g., tonne in the case of coal, 1000 brick in the case of brick kiln, passenger kilometre, etc.

## **COST CENTRE**

According to the Terminology, a cost centre is “a location, a person, or an item of equipment (or group of these) for which costs may be ascertained and used for the purposes of cost control.” This definition draws a distinction between a personal cost centre and an impersonal cost centre. If the cost centre consists of a location or item of equipment, it becomes an impersonal cost centre, but if it consists of a person or a group of persons, it becomes a personal cost centre. Cost centre can also be divided into an operation cost centre and a process cost centre.

## **METHODS OF COSTING**

Different methods of costing are discussed below.

### **Job Costing**

It is a method of costing where the costs are collected and accumulated for each job separately. This is done because each job requires different work and production is according to customer's specification. E.g., printing press, ship building, repair shops, locomotive engines, etc.

### **Batch Costing**

Under this method, orders for like products are arranged in convenient batches and each batch is treated as one job and cost is calculated accordingly. Cost is collected for each batch separately as in the case of job costing. E.g. biscuit manufacturing, garments, spare parts, etc.

### **Contract Costing**

Contract costing is applied to ascertain the costs incurred in each contract separately. It is pointed out that "a job is a small contract whereas a contract is a big job". E.g., building industries, construction work, etc.

### **Process Costing**

It is a method of costing that is employed by the process type of industries engaged in the production of goods which pass through distinct stages and in a definite sequence to completion. Under this method costs are collected and accumulated according to departments or process and the cost of each department or process is divided by the quantity of production to arrive at cost per unit. E.g., soap, textiles, chemical, sugar, food products, etc.

### **Operation Costing**

This involves every operation instead of a process. This is used where the manufacturing process consists of a number of distinct operations. E.g., leather, toy making, timber industries, etc.

### **Operating Costing**

Where it is desired to find out the cost of performing a service rather than the cost of producing a commodity, the method of costing to be applied is operating costing. E.g. transport undertakings, power supply concerns, hospitals, canteens, hotels, water works, gas companies, etc.

### **Single, Output or Unit Costing**

This method of costing is used by concerns producing a single article, or a few articles which are identical and capable of being expressed in simple quantitative units. E.g., cost per radio, camera, musical instruments, pencils, cigarettes, brick works, flour mills, etc.

### **Multiple Costing**

This involves the application of more than one method of costing in respect of the same product. E.g., bicycle, motor car, aeroplane, television manufacture, etc.

Table 1.1 compares financial accounting and cost accounts.

**Table 1.1** Differences Between Financial Accounting and Cost Accounting

<i>Financial Accounts</i>	<i>Cost Accounts</i>
1. Financial accounts are the accounts of the whole business	Cost accounts are only a part of financial accounts
2. Costs are reported in total in the financial accounts.	Cost are broken down on a unit basis in financial accounts
3. Financial accounts relate to all commercial transactions of the business	Cost accounts relate to transactions connected with the manufacture of goods and services
4. Financial accounts deal with actual facts and figures, i.e. historical costs	Financial accounts deal with estimates and standards
5. Financial accounts are concerned with external transactions	Financial accounts are concerned with internal transactions
6. Financial accounts disclose the net profit/loss of the business as a whole	Financial accounts disclose profit or loss of each product, unit, etc.
7. Financial accounts include all expenses, viz. manufacturing, office, selling and non-cost items	Financial accounts include only those expenses which enter into production
8. Financial accounts stock is valued at cost or market price whichever is less	Financial accounts include only those expenses which enter into production
9. Financial accounts does not reveal material wastages and idle time	They reveal wastages and idle time
10. Preparation of interim P&L A/c and Balance Sheet is not possible	Preparation of interim P&L A/c and Balance Sheet is possible
11. Inter-period and inter-firm comparison is not possible	Comparison is possible
12. For important managerial decision, data is insufficient	For important managerial decisions, data is sufficient
13. Financial accounting is a post-mortem analysis	Cost accounting is not a post-mortem analysis

## ELEMENTS OF COST

The elements of cost are the primary classification of costs according to the factor upon which expenditure is incurred.

The classification is threefold—material cost, labour cost and overhead cost.

## **Material Cost**

In the hotel and catering industry, apart from the sales of rooms and other services, food is prepared and sold to earn revenue, where ingredients form a major element in the preparation of food, such as meat, fish, vegetables, fruits, provisions, spices, milk and dairy products, ready made tinned and bottle products, and so on. It is the cost or expenditure incurred in procuring the ingredients for use, directly in production of food for sale and it is generally the largest portion of the total cost and selling price (normally in the range of 30–40%).

## **Labour Cost**

In order to convert the ingredients into finished products, human resources are required to be employed directly or indirectly in the process of making and selling of food and services. These people are to be remunerated according to their qualification, experience, skill and contribution. Hence, employing men and maintaining them gives rise to another type of expenditure which must be recovered from the sale of food. It is remuneration paid directly or indirectly to the employees and includes wages, salaries, bonus, commission, medical allowances, educational allowances, uniforms, free or subsidized means, social security benefits, pensions, gratuity, etc. Unlike food cost, this cost is lower, around 20–25%.

## **Overhead Cost**

These are expenditure other than on material and labour. Overhead cost includes cost of services provided to the concern and the notional cost of the use of owned assets. It is the expenditure of nominal nature which is necessarily incurred for the conduct of business operations, such as rent, taxes, printing and stationery, postage and telegram, advertisement charges, sales promotion expenses, electricity charges, fuel and power, etc. Overhead cost forms around 15–20% of the total cost.

## **CLASSIFICATION OF COST**

Cost can be classified on various basis. These are discussed in the following sections.

### **Functional Classification**

Costs are classified according to the functions to which they relate, viz. manufacturing, administration, selling and distribution.

#### ***Manufacturing Costs***

These include all expenses incurred up to the stage the finished product is ready with primary packing. Manufacturing costs include cost of raw materials, labour and other expenses incurred in the production unit. These are also known as *production costs*. Examples are rent of the production centre, depreciation on machinery and equipment, repairs and maintenance, electricity charges, etc.

#### ***Administration Expenses***

These are expenses incurred in the general administration of the concern. Administration expenses include expenditure on formulating policy, directing the organization and controlling the operations

of the concern, not directly related to production, selling or distribution expenses, bank charges, legal expenses, audit fees, director's fee, repairs of office premises, etc.

### ***Selling and Distribution Expenses***

Selling expenses are expenditure on selling or marketing of the products. They include expenditure on advertisement, market research, bad debts, salesmen's salaries, sales office expenses, after-sales service, gifts and free samples, etc. Distribution expenses relate to those items required for moving finished items from the production unit, storing it, and reaching it to the customers. These include expenditure on carriage outwards, storage expenses, insurance, packaging materials, repairs and reconditioning finished goods expenses on transport vans, etc.

Functional classification is a common classification of costs in a manufacturing organization.

### **Classification Based on Traceability**

Costs are classified into direct and indirect cost according to whether they can be identified with the product or not.

#### ***Direct Cost***

These costs are those which can be directly identified with a product, process or department. Materials used and labour employed in manufacturing an article or in a particular process production are examples of direct expenses. Direct cost is the responsibility of the departmental manager of the department concerned. Direct expenses are also known as *chargeable expenses*. According to Terminology, these are "expenses which can be identified with, and allocated to cost centers or cost units." Examples of this type of cost are food, beverages, wages, operating supplies and services, linen and laundry, etc.

#### ***Indirect Cost***

These are costs which are common to a number of products, processes or departments. These cannot be identified with a particular product or department. Indirect expenses are also known as *overheads*, such as supervisor's salary, office rent, depreciation on machinery, insurance, etc. An indirect cost is commonly referred to as an *undistributed cost* or one that cannot easily be identified with a particular department or area and thus cannot be charged to any particular department. For example, property operation, maintenance and energy costs could only be charged to various departments (such as rooms or food and beverage) with difficulty.

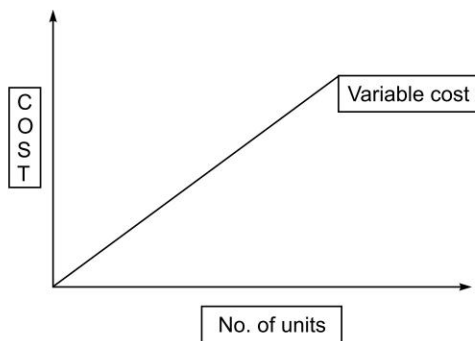
### **Classification Based on Variability**

Based on the fact whether the expenditure varies with the change in the volume of production, costs are classified into variable costs, fixed costs and semi-fixed costs.

#### ***Variable Costs***

These vary in proportion to the change in the volume of production (Fig. 1.1). The feature of variable cost is that per unit cost remains relatively constant, but the total cost increases with the increase in production and decreases with decrease in production. When there is no production, no variable cost is incurred. Variable cost is that cost which varies on a linear basis with revenue.

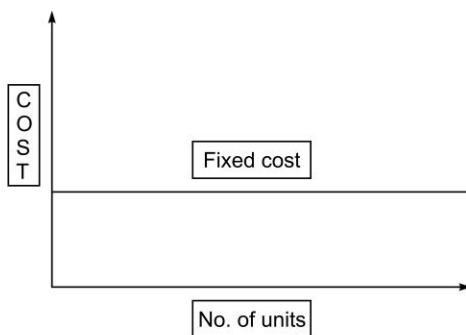
If 2 units of raw materials are required for manufacturing one unit of finished product, for manufacturing 10,000 units, 20,000 units of raw material would be required. Examples of variable cost are raw materials, wages, fuel, power, packing expenses, carriage, stores, tools and spares, cleaning, breakages, dishwashing, printing and stationery, postage, housekeeping supplies, travel agents commission, etc.



**Figure 1.1** Variable Cost

### **Fixed Costs**

These costs are those that remain the same within a certain range in the level of activity (Fig. 1.2). These are expenses which are fixed in amount irrespective of how much business is done. They have to be incurred even if there is no production and the factory is shut down. These are also called *shut down* or *start-by cost*. Since they are related to the time rather than the production level, they are also known as *period costs* as against the product cost (variable costs). While the total fixed cost remains the same, the fixed cost per unit changes with the change in the output level.

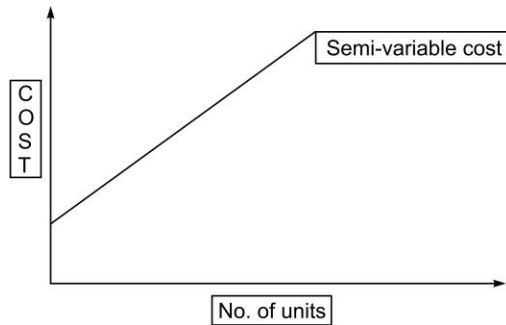


**Figure 1.2** Fixed Cost

The main examples of fixed costs are rent, rates, insurance, depreciation, mortgage interest, legal fee, audit fee, interest on capital, bank interest and charges, motor expenses, administration, repairs and maintenance, employees' remuneration and benefits, etc.

### **Semi-variable Costs**

These costs are those overheads which tend to vary with changes in volume of sales but not in direct proportion to the change (Fig. 1.3). Semi-variable costs remain constant over a relative short range of sales volume but change to a new level with an increase or decrease in the volume of activity. For example: lighting and heating-gas, electricity and fuel, telephone, repair and maintenance, advertising and display, etc. These bifurcations of costs are useful in calculating the break-even point, pricing, etc.



**Figure 1.3** *Semi-variable Cost*

### **Classification Based on Controllability**

Based on controllability, costs are classified as controllable and uncontrollable costs.

#### **Controllable Costs**

These costs are those which can be influenced by the action of a specified member of the undertaking. These are the costs where the management has a say. Most of the direct costs which are variable in nature are controllable costs, such as food cost.

#### **Uncontrollable Costs**

Costs which cannot be influenced by the action of a specified member of an undertaking are known as *non-controllable costs*. These are those costs in which the management has no say. Most of the fixed costs which are indirect in nature are uncontrollable costs.

### **Classification Based on Decision-making**

Classification of costs based on decision-making is discussed below.

#### **Sunk Costs, Out-of-pocket Costs and Imputed Cost**

**Sunk costs** are those historical costs which are already incurred and are irrevocable, where there is no current cash outflow on it. For example, in a decision on replacement of machinery, the investment in the existing machinery and the depreciation on it are sunk costs.

**Out-of-pocket costs** are those involving current or future cash outlay as a result of a decision. Out-of-pocket cost is a cost which gives rise to cash expenditure which is relevant for the purpose of decision-making. Depreciation is not included under out-of-pocket costs as there is no cash



outlay. Take the example of replacement of the machinery. The cash outlay involved in acquiring a new machinery, cost of training, if any, etc. is out-of-pocket expenses.

**Imputed costs** are those costs which do not involve any time actual cash outlay and which do not appear in the financial accounts. E.g., interest on capital, rent on building, etc.

### **Incremental or Differential Costs**

These are additional costs incurred on a new project or new product or additional production or new method of production. These are also known as *differential costs* since they represent the difference in the costs between two alternatives.

### **Opportunity Costs**

These costs are the benefit forgone by not choosing the second best alternative. When one course of action is taken, the other possible course is left out. As a result, the benefits that would accrue are given up. To the extent the benefits foregone can be quantified as the opportunity costs. For example, suppose a company owns a building which can be used in the business or rented out. If the company chooses to use the building for business purposes, the rent forgone by not letting out it is the opportunity cost of using the building for business purposes.

### **Avoidable and Unavoidable Costs**

Avoidable costs are those which can be eliminated if a particular product or department is dropped. For example, if a particular department is closed, the salary paid to the employees in that department need not be incurred. Unavoidable costs cannot be eliminated by dropping any particular product or department. For example, the salary of the general manager is an unavoidable cost.

## **EXPENSES NOT INCLUDED IN COST ACCOUNTS**

There are certain expenses which are excluded from cost accounts because they have no connection with the production or sale of the product. These expenses are known as *non-cost expenses*. They are as follows:

- (a) Capital expenditure such as purchase of plant, building, etc.
- (b) Appropriation of profits, like dividend, reserves and provisions, donation, income tax, etc.
- (c) Matters of pure finance, such as interest on debentures, discount on issue of shares and debentures, brokerage and underwriting commission, rent received, loss on sale of fixed assets, profits on sale of fixed assets, etc.
- (d) Goodwill written off, preliminary expenses written off, provisions, etc.

## **Objective Type Questions**

*Fill in the blanks:*

- (a) \_\_\_\_\_ refers to the technique and process of ascertaining cost of a product or service.
- (b) Costing is required to provide an estimated cost for a product both in its finished state and as \_\_\_\_\_.

- (c) A cost \_\_\_\_\_ is a unit of product, service, or time in relation to which costs may be ascertained or expressed.
- (d) Cost of ingredients is \_\_\_\_\_ cost.
- (e) Expenditure other than on material and labour is called \_\_\_\_\_ cost.

### Review Questions

1. What is costing?
2. What is cost accounting?
3. What is cost accountancy?
4. What is a cost unit?
5. What is a cost centre?
6. What is the need for costing?
7. What are the advantages of costing?
8. What do you mean by:
  - (a) Job costing
  - (b) Batch costing
  - (c) Process costing
  - (d) Operation costing
  - (e) Operating costing
  - (f) Multiple costing
  - (g) Contract costing
  - (h) Single unit costing
  - (i) Variable cost
  - (j) Fixed cost
  - (k) Semi-variable/fixed cost
9. Distinguish between fixed cost and variable cost.
10. Give two examples of semi-fixed/semi-variable cost in relation to hotel industry.
11. Briefly explain the elements of cost.
12. Differentiate between financial accounting and cost accounting.
13. What are the objectives of costing?
14. Discuss the various bases of classification of cost with suitable examples.
15. What are the items to be excluded from cost accounts and why?

# 2

## Chapter

# Hotel Cost Sheet

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning, objectives and advantages
- Meaning of material (food and beverage) cost, food cost calculation and objectives of food or material costing
- Advantages, contents and format
- Meaning of gross profit (kitchen profit), after-wage profit (net margin) and not profit
- Meaning of labour cost and treatment of its various components
- Time keeping and time booking and mechanized methods of time recording
- Meaning and causes of labour turnover
- Meaning of overheads and classification of overheads

### COST SHEET

Cost sheet is a statement showing the details of the total cost of the job, order or operation. It shows the total cost as well as different elements of cost and cost per unit.

### Objectives of Cost Sheet

The objectives of cost sheet are as follows:

- (i) It reveals the total cost and cost per unit.
- (ii) It discloses the different elements of cost.
- (iii) It helps in fixing up selling price.
- (iv) It helps in the preparation of estimates for submission of tenders.

## Advantages of Cost Sheet

The advantages of cost sheet are as follows:

- (i) It enables the management to keep a close watch and control over the production.
- (ii) It provides a comparative study of the various ingredients.
- (iii) It helps in formulating a useful production policy.

In the case of hotel cost sheet, the total cost comprises the three basic elements of cost:

- (i) Food cost or material cost
- (ii) Labour cost
- (iii) Overhead cost

## OBJECTIVES OF FOOD COSTING OR MATERIAL COSTING

The food cost may be defined as the cost of material used in producing the food sold, i.e. the cost of the food consumed less the cost of staff meals. The objectives of food costing are as follows:

- (i) To ascertain the food cost of a particular item on the menu
- (ii) To ascertain the total expenditure on food over a period of time
- (iii) To control costs, prices and profit margins and provide information for formulating an effective pricing policy
- (iv) To disclose faulty purchasing and inefficient storing
- (v) To prevent waste and pilferages
- (vi) To ensure consumer satisfaction
- (vii) To bring cost-consciousness among employees
- (viii) To reduce cost and improve quality
- (ix) To provide cost estimates to manager for developing budgets
- (x) To assist manager in making control decision
- (xi) To evaluate pricing and establish future pricing

Figure 2.1 illustrates the format for food cost calculation.

	₹	₹
Cost of food consumed	xxx	
Less: Staff meals	<u>xx</u>	
<b>Food Cost</b>		<b>xxx</b>
or		
Opening Stock of Raw Material	xx	
Add: Purchases of Raw Material		<u>xx</u>
		xx
Less: Cost of Staff Meals	<u>xx</u>	
		xx
Less: Closing Stock		<u>xx</u>
<b>Food Cost</b>		<b>xx</b>

**Figure 2.1** Food Cost Calculation (Contd.)

$$FC = OS + (P - PR) - CS$$

where

FC = Food Cost

OS = Opening Stock

P = Purchases

PR = Purchase Return

CS = Closing Stock

**Figure 2.1** *Food Cost Calculation***MATERIAL COST (FOOD AND BEVERAGE COST)**

Material cost refers to the basic cost of food and beverages in catering business. These are direct costs which are identified with the product such as food costs, beverage costs, cost of tobacco and cigarette, cost of sundry sales, etc. Cost sheet or statement of food cost is a statement which provides the assembly of the detailed cost in respect of a cost of unit.

**FOOD COST SHEET/INGREDIENT COST SHEET**

**XYZ HOTELS**  
**INGREDIENT COST SHEET**

Name of the Dish _____		Date _____	
No. of portions _____			
Ingredients	Qty.	Unit Cost	Total Cost

Standard Portion \_\_\_\_\_

Selling Price/unit if Food cost is

Yield \_\_\_\_\_

30% \_\_\_\_\_

Wastage \_\_\_\_\_

40% \_\_\_\_\_

**Figure 2.2** *Format of an Ingredient Cost Sheet***Advantages of Food Cost Sheet**

- (i) It discloses the food cost of a dish and the cost per unit.
- (ii) It enables the management to keep a close watch and control over the production.
- (iii) It provides a comparative study of the various ingredients.
- (iv) It helps in formulating a useful production policy.
- (v) It helps in fixing up the selling price of the items produced.

A food cost sheet or ingredient cost sheet (Fig. 2.2) provides the following details:

- (a) Date
- (b) Name of the dish
- (c) Number of portions
- (d) Name of each ingredient
- (e) Quantity of each ingredient
- (f) Unit cost
- (g) Cost of each unit
- (h) Total food cost
- (i) Cost per portion

$$\text{Food Cost Percentage} = \frac{\text{Food Cost}}{\text{Sales}} \times 100$$

### Gross Profit

Gross profit is the amount left out of the total sales when only the costs of goods have been deducted. In other words, it is the excess of sales over the cost of materials. In the case of food and beverage operations, gross profit is referred to as kitchen profit or bar profit, depending on whether it is the gross profit on food operation or beverage operation. Gross profit is also known as *Gross Margin*.

$$\text{Gross profit} = \text{Labour cost} + \text{Overhead cost} + \text{Net profit}$$

or

$$\text{Gross profit} = \text{Sales} - \text{Cost of materials}$$

or

$$\text{Kitchen profit} = \text{Food sales} - \text{Food cost}$$

or

$$\text{Bar profit} = \text{Bar sales} - \text{Bar Cost}$$

$$\text{Gross profit percentage} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

### LABOUR COST

Labour costs are those expenses incurred in processing and producing a particular product. These are mostly direct costs, which are identified or attributed wholly to a particular product or process or dish or spend in converting raw materials into finished goods. These are paid in the form of salaries, wages, allowances (medical, educational), free or subsidized meals, social security benefits, pensions, provident fund, gratuity, bonus, ESI, etc. Most of the labour cost elements are controllable in nature.

$$\text{Labour Cost Percentage} = \frac{\text{Labour Cost}}{\text{Sales}} \times 100$$

## **TIME KEEPING AND TIME BOOKING**

**Time keeping** means the recording of time of a worker's arrival at and departure from the hotel for the purpose of attendance and wage calculations.

**Time booking** is the reporting of each worker's time for each department, operation and job for the purposes of cost analysis and apportionment of labour cost between various jobs and department.

These two recordings should be regularly reconciled to establish the accuracy of recordings of time.

### **Mechanized Methods of Time Recording**

#### ***Dial Time Recorders***

This consists of a mechanism with a dial having a number of holes about the circumference. When a worker enters the hotel, he presses the dial arm into a hole which denotes his particular number, and time is recorded automatically in the attendance form placed inside. This form will contain the numbers and names of all the workers, one below the other with columns for the 'entry' and 'exit' timings of each day.

#### ***Key Recorded System***

This is a mechanism with a number of keys, each key bearing the number of a worker. When a worker enters the factory, he inserts his particular key in the key hole and gives a turn, the ticket number and the clock time recorded on a sheet of paper.

Under both the above methods, there is no need of copying out the record, as the paper kept inside the clock forms part of the payroll.

#### ***Punch Card Time Clock***

Time clocks that use punch cards are the most widespread type of time clock on the market. A card with preprinted lines to separate entries is inserted into a slot. The card triggers a switch that activates the print head that prints the date and time.

Punch clocks are a good choice for small or mid-size companies because of their simple setup and use. Digital punch card time clocks can keep a running total of time worked. This is a handy feature when figuring payroll. Punch clocks usually include a key that is required for opening the setup compartment.

#### ***Digital Electronic Time Clock***

Digital electronic time clocks are a new innovation in time clock equipment. Slowly replacing the traditional punch-style time clock, digital time clocks store time in/out times electronically in the machine for later retrieval.

Some digital units have a touch pad for keying in a code that clocks you in and out. Others have a card reader that records the date and time when you swipe through a card with a magnetic stripe. By adding a photo of the employee, this card can double as a company ID.

Digital time clocks keep a running tally of time worked to streamline payroll operations. Some digital time clocks have a computer and printer interface for downloading time data to the payroll department computer. Security features built into digital time clocks prevent any kind of tampering.

### **Biometric Time Clocks**

Biometric Time Clocks are digital attendance systems that allow people to clock in/out by authenticating characteristics on a person's finger, palm or hand print. Some units are also able to identify employees by measuring the dimensions of the hand.

These systems are convenient because they eliminate the hassle of using paper time or the cost of replacing plastic ID cards with magnetic stripes. It also adds an additional element of security to the workplace by reducing or eliminating unauthorized personnel. Since the employee must be present, it also eliminates employee fraud such as "buddy punching."

Buddy punching is an unauthorized employee tampering with another employee's timecard by clocking in/out for them, costing the company thousands in labour costs from unearned wages. Biometrics time clocks are compatible with time station software, allowing payroll workers to export time data to payroll software such as Attendance RX, QuickBooks, Paychex, Peachtree and more.

### **Wage Abstract**

This is a summary prepared weekly or monthly, showing the amount of time spent by workers on different jobs. This shows an analysis of wages paid during a period of time on different jobs.

### **Idle Time and its Treatment in Cost Accounts**

Idle time is the time for which wages are paid, but production is not obtained. Idle time may represent loss of time of labour, machines, etc.

For the purpose of treatment in cost account, idle time can be divided into two types:

- (a) Normal idle time
- (b) Abnormal idle time

Normal idle time refers to that loss of time which is generally unavoidable and is bound to arise, e.g. time required to go from gate to department, tea, lunch breaks, etc.

The cost of normal idle time is treated in one of the following ways:

- (b) It is directly charged to factory overhead account.
- (c) Wage rate may be inflated by using inflated rate method.

Abnormal idle time may be due to both avoidable and unavoidable causes. E.g. breakdown of machinery, failure of power supply, strikes, lockouts, etc. The cost of abnormal idle time is written off to costing profit and loss account.

### **Overtime**

When workers work for more than the normal hours, the excess time is known as *over time*. Overtime is generally paid at double the normal rate. The excess of overtime paid over normal rate is called *overtime premium*.

### **LABOUR TURNOVER**

It is a regular feature in every business organization that some workers leave their jobs and some new workers take their place. This mobility or change in the labour force is known as *labour turnover*.



Labour turnover may be defined as the number of workers leaving the factory during a given period in relation to the average number of workers employed during the period.

$$\text{Labour turnover ratio} = \frac{\text{Number of persons replaced during a period} \times 100}{\text{Average number of workers in the period}}$$

## **Causes of Labour Turnover**

### **Avoidable Causes**

- (a) Low wages
- (b) Bad working conditions
- (c) Lack of job satisfaction
- (d) Lack of retirement benefits
- (e) Lack of promotion opportunities
- (f) Lack of proper amenities like medical and other facilities, etc.

### **Unavoidable Causes**

- (a) Change of service for personal betterment
- (b) Death or retirement
- (c) Illness, marriage, domestic responsibilities, etc.

## **Effects of Labour Turnover**

- (a) The morale of employees is adversely affected.
- (b) The performance of new workers would usually be poor.
- (c) Loss of trained and skilled persons whose productivity may be higher.
- (d) The cost of selection and training of the newly appointed workers necessarily increases the cost of production.

## **Measurement of Labour Turnover**

### ***Separation Method***

Under this method, measurement is made by dividing the total separation during a period by the average number of workers during that period.

### ***Replacement Method***

Under this method, the turnover ratio is obtained by dividing the number of replacements during a given period by the average numbers during that period.

### ***Flux Method***

This method is a combination of the separation and replacement methods.

$$\text{Labour turnover ratio} = \frac{\text{Number of Separation} + \text{Number of Replacement} \times 100}{\text{Average number of workers}}$$

## FRINGE BENEFITS

These include medical facilities, travelling benefits, pension, insurance, subsidized meals, free education to workers' children, etc. These may be treated as departmental overheads.

## CASUAL WORKERS

Casual workers are those who are employed temporarily to cope with a sporadic increase in the volume of work.

## OUT WORKERS

Workers who carry on productive operations outside the factory at far away sites or in their own homes are called out workers or field labour.

## AFTER-WAGE PROFIT

The excess of sales over the cost of materials and labour costs is expressed as after-wage profit. Catering establishments operating at a high labour cost, which are subject to seasonal fluctuations in sales, need to control their labour costs. After-wage profit is also known as *Net Margin*.

$$\text{After-wage profit} = \text{Sales} - (\text{Material cost} + \text{Labour cost})$$

$$\text{After-wage profit percentage} = \frac{\text{AWP}}{\text{Sales}} \times 100$$

## OVERHEADS

All expenses, other than direct material, direct wages and direct expenses, are known as *indirect expenses* or *overheads*. Wheldon defines overhead as “the cost of indirect materials, indirect labour and such other expenses, including services, as cannot conveniently be charged direct to specific cost units.” The Terminology defines overhead as “the aggregate of indirect material cost, indirect wages and indirect expenses.”

These are other expenses of nominal nature, which are necessarily incurred in the conduct of the business operations. These costs are known as *indirect costs*. All costs need to be related to a suitable unit of output which is called a “Cost Unit.” In the case of a food and beverage establishment, a cost unit may be:

- (a) A Dish
- (b) A *Table d'hote* (a complete meal)
- (c) A Banquet

Overheads can be classified as:

- (a) Manufacturing Overheads
- (b) Administration Overheads
- (c) Selling and Distribution Overheads
- (d) Research and Development Overheads

Overheads are also classified on the basis of identity as:

- (a) Indirect Materials
- (b) Indirect Labour
- (c) Indirect Expenses

From the point of view of behaviour of costs in response to changes in the volume of sales, overheads can be classified as:

- (a) Fixed Overheads
- (b) Variable Overheads
- (c) Semi-variable Overheads

In Hotel and Catering business, all expenses, other than food cost and labour cost, are treated as overheads. Some examples are:

- (i) Rent and Rates
- (ii) Insurance
- (iii) Heat, Light, and Power
- (iv) Gas, Electricity, and Fuel
- (v) Postage, Printing and Stationery
- (vi) Telephone
- (vii) Advertising and Sales Promotion
- (viii) Repair and Maintenance
- (ix) Renewals
- (x) Cleaning and Laundry
- (xi) Motor Expenses
- (xii) Depreciation
- (xiii) Bank Interest and Charges
- (xiv) Loan Interest
- (xv) Legal Fees
- (xvi) Audit Fees
- (xvii) Sundry Expenses

$$\text{Overheads Percentage} = \frac{\text{Overheads}}{\text{Sales}} \times 100$$

## NET PROFIT

Net profit is the residual profit available for the proprietor after meeting all other costs of the business. This is the reward for capital invested in the business by the businessman. As there is considerable amount of seasonal fluctuations in the case of food and beverages business, it is very important for the businessman to keep a check on the expenses so as to earn a reasonable amount of net profit.

The net profit may be expressed as follows:

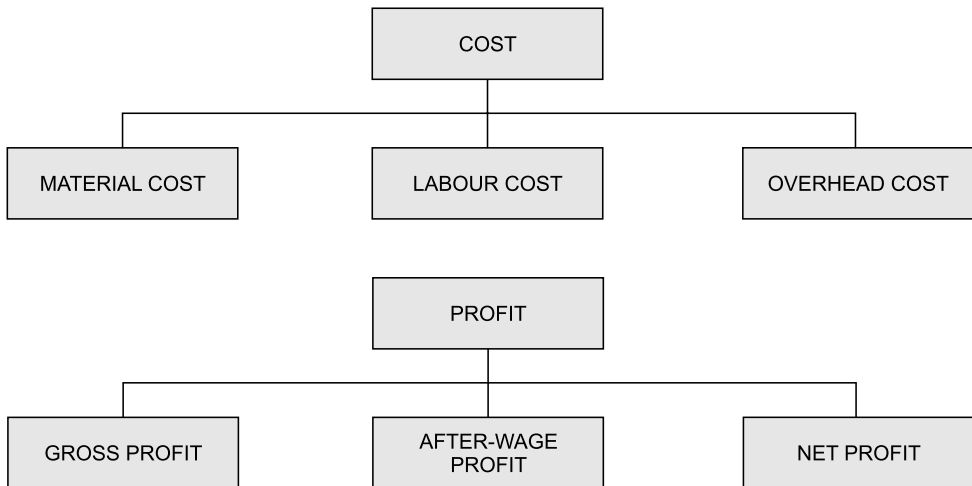
$$\text{Net Profit} = \text{Sales} - (\text{Material Cost} + \text{Labour Cost} + \text{Overhead Cost})$$

or

$$(\text{Material Cost} + \text{Labour Cost} + \text{Overheads} + \text{Net Profit}) = \text{Sales}$$

$$\text{Net Profit Percentage} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

Figure 2.3 depicts the various elements of cost and profit.



**Figure 2.3** *Elements of Cost and Profit*

Figure 2.4 shows a format of hotel cost sheet.

	₹	₹
<b>SALES</b>		<b>xx</b>
<b>LESS: MATERIAL COST</b>		
Opening Stock of Raw Material	xx	
Add: Purchases of Raw Material (NET)	<u>xx</u>	
	xx	
Less: Cost of Staff Meals	<u>xx</u>	
	xx	
Less: Closing Stock	<u>xx</u>	<b>xx</b>
<b>GROSS PROFIT</b>		<b>xx</b>
<b>LESS: LABOUR COST</b>		
Salaries and Wages	xx	

**Figure 2.4** *Hotel Cost Sheet (Contd.)*

Allowances	xx	
Subsidized staff meals	xx	
Social security benefits	xx	
Pensions	xx	
Provident Fund	xx	
Gratuities	xx	
Bonus	xx	
ESI	xx	xx
<b>AFTER-WAGE PROFIT</b>		<b>xx</b>
<b>LESS: OVERHEADS</b>		
(i) Rent and Rates	xx	
(ii) Insurance	xx	
(iii) Heat, Light, and Power	xx	
(iv) Gas, Electricity, and Fuel	xx	
(v) Postage, Printing and Stationery	xx	
(vi) Telephone	xx	
(vii) Advertising and Sales Promotion	xx	
(viii) Repair and Maintenance	xx	
(ix) Renewals	xx	
(x) Cleaning and Laundry	xx	
(xi) Motor Expenses	xx	
(xii) Depreciation	xx	
(xiii) Bank Interest and charges	xx	
(xiv) Loan Interest	xx	
(xv) Legal Fees	xx	
(xvi) Audit Fees	xx	
(xvii) Sundry Expenses	xx	xx
<b>NET PROFIT</b>		<b>xx</b>

Figure 2.4 Hotel Cost Sheet

## ILLUSTRATIONS

### Ingredient Cost Sheet (Dish Cost Sheet)

1. Calculate the following:

- Cost of 1 ½ dozen capon weighing 2.375 kg each at ₹ 56 per kg
- 4 fans of celery (12 heads to a fan) at ₹ 8 per head
- Half bag of carrots (25 kg to a bag) at ₹ 18 per kg
- One crate of eggs (360 to a crate) at ₹ 13 per dozen
- One case of grape fruit (60 to a case) at ₹ 8 each

**Solution:**

<i>Cost of Ingredients</i>			
<i>Ingredient</i>	<i>Qty.</i>	<i>Rate (₹)</i>	<i>Amount (₹)</i>
Capon	1 ½ Dozen (2.375 kg)	56 per kg	133.00
Celery	4 Fans (12 heads to fan)	8 per head	384.00
Carrots	½ Bag (25 kg to a bag)	18 per kg	225.00
Eggs	1 Crate (360 to a crate)	13 per doz.	390.00
Grape Fruit	1 Case (60 to a case)	8 each	480.00

2. Meat with bones is purchased at ₹ 45 per kg. Bone weight loss amounts to 11% of the total weight and cooking loss is 20% of the boned weight. Calculate the cost per kg of the cooked meat.

**Solution:**

Cost of meat with bone for one kg	₹ 45.00
Less: Bone weight loss (11%)	₹ 04.95
	₹ 40.05
Less: Cooking loss (20% of boned weight)	₹ 08.01
Cost of cooked meat per kg	₹ 32.04

3. From the following information supplied to you by Sowmya Restaurant, prepare ingredient cost sheet and also find out the selling price per portion to earn a gross profit of 68% of the selling price.

Name of the Dish: Egg Mushroom

Number of Portions: 10

Ingredients:

Mushrooms	500 gm	@ ₹ 200/kg
Loaf	½ No.	@ ₹ 22 per loaf
Butter	200 gm	@ ₹ 135/kg
Onions	800 gm	@ ₹ 15/kg
Garlic	20 gm	@ ₹ 24/kg
Flour	100 gm	@ ₹ 15/kg
Eggs	4 Nos.	@ ₹ 24 per dozen
Veal	1.4 kg	@ ₹ 260/kg
Salt		₹ 1
Coriander leave	20 gm	@ ₹ 10/kg
Refined groundnut oil	500 gm	@ ₹ 100/kg

**Solution:**

<i>Ingredient Cost Sheet</i>			
Name of the Dish	Egg Mushroom		
No. of Portions	10		
<i>Ingredient</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount (₹)</i>
Mushroom	500 gm	₹ 200/kg	100.00
Loaf	½ No.	₹ 22 per loaf	11.00
Butter	200 gm	₹ 135/kg	27.00
Onions	800 gm	₹ 15/kg	12.00
Garlic	20 gm	₹ 24/kg	0.48
Flour	100 gm	₹ 15/kg	1.50
Eggs	4 Nos.	₹ 24 per dozen	8.00
Veal	1.4 kg	₹ 260/kg	364.00
Salt	—	—	1.00
Coriander leaves	20 gm	₹ 10/kg	0.20
Refined groundnut oil	500 gm	₹ 100/kg	50.00
<b>Total Cost</b>			<b>575.18</b>

Cost per portion =  $575.18/10 = ₹ 57.518$

Gross Profit % = 68%

Selling Price = 100%

Food Cost % =  $100 - 68 = 32\%$

Therefore, Selling price per portion to earn a Gross Profit of 68% =  $\frac{57.518}{32} \times 100$   
 = 179.74, approximately ₹ 180

4. From the following information, you are required to prepare an ingredient cost sheet and find out the selling price per portion to earn a Gross Profit of 65% on the selling price.

Name of the Dish: Navarin Printainer

No. of portions: 10

Ingredients:

Clarified Fat	50 gm	@ ₹ 48/kg
Stewing Lamb	900 gm	@ ₹ 105/kg

Brown Stoke	8 gm	@ ₹ 41/kg
Flour	30 gm	@ ₹ 20/kg
Turnips	1.8 kg	@ ₹ 24/kg
Carrots	900 gm	@ ₹ 30/kg
Button mushrooms	900 gm	@ ₹ 154/kg
Potatoes	900 gm	@ ₹ 20/kg
Peas	50 gm	@ ₹ 30/kg
French beans	50 gm	@ ₹ 50/kg
Parsely, pinch of sugar		₹ 1

**Solution:**

<i>Ingredient Cost Sheet</i>			
Name of the Dish		Navarin Printainer	
No. of Portions	10		
<i>Ingredient</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount (₹)</i>
Clarified Fat	50 gm	₹ 48/kg	2.40
Stewing Lamb	900 gm	₹ 105/kg	94.50
Brown Stoke	8 gm	₹ 41/kg	0.328
Flour	30 gm	₹ 20/kg	6.00
Turnips	1.8 kg	₹ 24/kg	43.20
Carrots	900 gm	₹ 30/kg	27.00
Button mushrooms	900 gm	₹ 154/kg	138.60
Potatoes	900 gm	₹ 20/kg	18.00
Peas	50 gm	₹ 30/kg	1.50
French beans	50 gm	₹ 50/kg	2.50
Parsley, pinch of sugar	—	—	1.50
<b>Total Cost</b>			<b>335.028</b>

Cost per portion =  $335.028/10 = ₹ 33.50$

Gross Profit % = 65%

Selling Price = 100%

Food Cost % =  $100 - 65 = 35\%$

Therefore, Selling price per portion to earn a Gross Profit of 68% =  $\frac{33.50}{35} \times 100$

= 95.71, approximately ₹ 96



5. From the following information supplied to you by Arcade Restaurant you are required to:
- Prepare dish costing sheet.
  - Calculate cost per portion.
  - Find the selling price per portion necessary to produce a gross profit of 62% of sales.

Name of the Dish: Veal Stew

No. of Portions: 12

Ingredients:

Stewing Veal	1.4 kg @ ₹ 259/kg
Butter	200 gm @ ₹ 135/kg
Flour	100 gm @ ₹ 20/kg
Onions	700 gm @ ₹ 46/kg
Mushrooms	500 gm @ ₹ 140/kg
Eggs	3 Nos. @ ₹ 58/dozen
Loaf	½ No. @ ₹ 22/loaf

**Solution:**

<i>Ingredient Cost Sheet</i>			
Name of the Dish		Veal Stew	
No. of Portions	12		
<i>Ingredient</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount (₹)</i>
Stewing Veal	1.4 kg	₹ 259/kg	362.60
Butter	200 gm	₹ 135/kg	27.00
Flour	100 gm	₹ 20/kg	2.00
Onions	700 gm	₹ 46/kg	32.20
Mushrooms	500 gm	₹ 140/kg	70.00
Eggs	3 Nos.	₹ 58/dozen	14.50
Loaf	½ No.	₹ 22/loaf	11.00
<b>Total Cost</b>			<b>519.30</b>

$$\text{Cost per portion} = 519.30/12 = ₹ 43.275$$

$$\text{Gross Profit \%} = 62\%$$

$$\text{Selling Price} = 100\%$$

$$\text{Food Cost \%} = 100 - 62 = 38\%$$

$$\begin{aligned} \text{Therefore, selling price per portion to earn a Gross Profit of 68\%} &= \frac{43.275}{38} \times 100 \\ &= 113.88, \text{ approximately } ₹ 114 \end{aligned}$$

6. The following is an extract taken from an invoice sent by a supplier to the Jantar Manar Hotel:

1 gross at ₹ 275.00 per dozen  
 5 liters @ ₹ 93.50 per liter  
 4.5 kg @ ₹ 385.00 per 250 gram  
 20 bottles at ₹ 1155.00 each  
 Trade discount 15% and cash discount 4%

You are required to calculate:

- (i) The total bill before any discount.
- (ii) The total amount to be sent by the hotel to the supplier if the hotel received both trade and cash discount.

**Solution:**

1. Total bill before any discount

	₹
1 Gross at ₹ 275.00 per dozen	= 3,300.00
(1 Gross = 12 dozen)	
5 liters @ ₹ 93.50 per liter	= 467.50
4.5 kg @ ₹ 385.00 per 250 gram	= 6,930.00
20 bottles at ₹ 1155.00 each	= 23,100.00
	<u>33,797.50</u>

2. The total amount to be sent by the hotel to the supplier with both trade and cash discount:

	₹
Total Bill Amount without Discount	= 33,797.50
Less: Trade Discount 15%	= 5,069.625
	<u>28,727.875</u>
Less: Cash Discount 4%	= 1,149.115
	<u>27,578.760</u>

7. In a fast food unit, the net purchases of food during the month of January amounted to ₹ 7975, the value of stock on 1st January being ₹ 1035 and on 31st January ₹ 1512. What was the cost of food consumed during the month?

**Solution:**

	₹
Opening Stock of Food on 1st Jan.	= 1,035.00
Add: Net Purchases of Food	= 7,975.00
	<u>9,010.00</u>
Less: Closing Stock of Food on 31st Jan.	1,512.00
Cost of Food Consumed	= <u>7,498.00</u>

8. Calculate the cost of food consumed form the following:

(a) Purchases for the month of May	₹ 23,184
Stock on 1st May	14,490
Purchases Return during the month	5796
Stock on 31st May	17,388
(b) Stock on 1st Nov	₹ 15,984
Stock on 30th Nov.	19,360
Purchases for the month of Nov.	21,560
Purchases returns during the month.	5280

**Solution:**

		₹
(a) Opening Stock on 1st May	=	14,490.00
Add: Purchases	=	23,184.00
		<u>37,674.00</u>
Less: Purchases Return	=	5,796.00
		<u>31,878.00</u>
Less: Closing Stock on 31st May	=	17,388.00
Cost of Food Consumed	=	<u>14,490.00</u>

		₹
(b) Opening Stock on 1st Nov.	=	15,984.00
Add: Purchases	=	21,560.00
		<u>37,544.00</u>
Less: Purchases Return	=	5,280.00
		<u>32,264.00</u>
Less: Closing Stock on 30th Nov.	=	19,360.00
Cost of Food Consumed	=	<u>12,904.00</u>

9. The following figures are extracted from the books of Sky Lab Restaurant for the last four weeks:

	Week I	Week II	Week III	Week IV
	₹	₹	₹	₹
Sales	80,000	82,000	81,000	83,000
Opening Stock of food	5000	7000	6000	7000
Purchase of food	30,000	27,700	30,200	32,500
Closing stock of food	7000	6000	7000	8000

You are required to prepare the food cost report for each week which clearly shows the following:

- (i) Cost of food sold
- (ii) Gross profit
- (iii) Gross profit percentage of sales

**Solution:**

<i>Weekly Cost and Profit Report</i>								
<i>Particulars</i>	<i>Week 1</i>	<i>%</i>	<i>Week 2</i>	<i>%</i>	<i>Week 3</i>	<i>%</i>	<i>Week 4</i>	<i>%</i>
<b>Sales (A)</b>	80,000	100	82,000	100	81,000	100	83,000	100
<b>Less: Cost of Food Consumed</b>								
Opening Stock	5000		7000		6000		7000	
Add: Purchases	30,000		27,700		30,200		32,500	
	<b>35,000</b>		<b>34,700</b>		<b>36,200</b>		<b>39,500</b>	
Less: Closing Stock	7000		6000		7000		8000	
<b>Food Cost (B)</b>	<b>28,000</b>	<b>35</b>	<b>28,700</b>	<b>35</b>	<b>29,200</b>	<b>36.05</b>	<b>31,500</b>	<b>37.95</b>
<b>Gross Profit (C = A – B)</b>	<b>52,000</b>	<b>65</b>	<b>53,300</b>	<b>65</b>	<b>51,800</b>	<b>63.95</b>	<b>51,500</b>	<b>62.05</b>

10. From the following information of M/s Aaleeshan restaurant, you are required to:

- (i) Prepare a cost sheet.
- (ii) Calculate cost per portion.
- (iii) Show the selling price per portion to produce the same gross profit percentage if the cost of ingredients increases by ₹ 80 for fifteen portions.

Name of the Dish: Crepes au Citron

Number of portions: 15

Ingredients

Milk	1 litre	@ ₹ 19 per litre
Flour	400 gm	@ ₹ 20 per kg
Eggs	4 Nos	@ ₹ 58 per dozen
Caster Sugar	300 gm	@ ₹ 39 per kg
Lemons	4 Nos.	@ ₹ 8 each

**Solution: (i)**

<i>Ingredient Cost Sheet</i>			
Name of the Dish		Crepes au Citron	
No. of Portions	15		
<i>Ingredient</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount (₹)</i>
Milk	1 ltr	₹ 19 per litre	19.00

*Contd.*

Flour	400 gm	₹ 20 per kg	8.00
Eggs	4 nos.	₹ 58 per dozen	19.33
Caster Sugar	300 gm	₹ 39 per kg	11.70
Lemons	4 nos.	₹ 8 each	32.00
<b>Total Cost</b>			<b>90.03</b>

(ii) Cost per portion =  $\frac{90.03}{15} = ₹ 6.00$

- (iii) Selling price per portion to earn the same gross profit if the cost of ingredients increases by ₹ 80.00 for 15 portions:

Ingredient cost after increase =  $90.03 + 80.00 = ₹ 170.03$

Let us assume the gross profit percentage as 100%.

Hence, the selling price per portion to earn the same GP =  $\frac{₹ 170.03}{15}$   
**= ₹ 11.34**

### Hotel Cost Sheet

11. From the following particulars, calculate the kitchen profit and kitchen profit percentage, cost of goods sold and cost of goods sold percentage, and average spending power:

	₹		₹
Opening stock	90,000	Wages	52,000
Purchases	2,40,000	Sales	4,36,000
Returns outwards	10,000	Staff meals	18,000
Closing stock	1,02,000		

### Solution:

Hotel Cost Sheet			
Particulars	₹	₹	%
<b>Sales</b>		<b>4,36,000</b>	<b>100</b>
<b>Less: Cost of Food sold</b>			
Opening Stock	9000		
Add: Purchases	2,40,000		
	<b>2,49,000</b>		
Less: Returns Outwards	10,000		
	<b>2,39,000</b>		

Contd.

Less: Closing Stock	1,02,000		
	<b>1,37,000</b>		
Less: Staff Meals	18,000	<b>1,19,000</b>	<b>27.29</b>
<b>Gross Profit (K.P.)</b>		<b>3,17,000</b>	<b>72.71</b>
Less: Wages	52,000		
Staff Meals	18,000	<b>70,000</b>	
<b>After-Wage Profit</b>		<b>2,47,000</b>	<b>56.65</b>

1. **Percentage of cost of Food Sold** = Food Cost/Sales  $\times 100 = 1,19,000/4,36,000 \times 100 = 27.29\%$

2. **Kitchen profit%** = K.P./Sales  $\times 100 = 2,99,000/4,36,000 \times 100 = 68.58\%$

12. Prepare Cost and Profit Statement from the following information

(i) January 1993	₹
Sales	37,500
Overheads	6750
Labour Cost	11,250
Food Cost	14,450

(ii) December 1992	₹
Food Cost	24,960
Labour Cost	17,920
Overheads	15,520
Sales	16,400

**Solution:**

Hotel Cost Sheet January 1993			
Particulars	₹	₹	%
<b>Sales</b>		<b>37,500</b>	<b>100.00</b>
Less: Cost of Food sold		14,450	38.53
<b>Gross Profit</b>		<b>23,050</b>	<b>61.47</b>
Less: Labour Cost		11,250	30.00
<b>After-wage Profit</b>		<b>11,800</b>	<b>31.47</b>
Less: Overheads		6750	18.00
<b>Net Profit</b>		<b>5050</b>	<b>13.47</b>

<i>Hotel Cost Sheet December 1992</i>			
<i>Particulars</i>	₹	₹	%
<b>Sales</b>		<b>16,400</b>	<b>100.00</b>
<i>Less: Cost of Food sold</i>		24,960	152.20
<b>Gross Loss</b>		<b>–8560</b>	<b>–52.20</b>
<i>Less: Labour Cost</i>		17,920	109.27
<b>After-wage Profit</b>		<b>–26,480</b>	<b>–161.47</b>
<i>Less: Overheads</i>		15,520	94.63
<b>Net Loss</b>		<b>–42,000</b>	<b>–256.10</b>

13. The following information has been extracted from the records of the Humming Bee Restaurant for April 1993

	₹
Sales	7200
Stock as on 1.4.1993	690
Stock as on 30.4.1993	540
Purchases	2430
Salaries and Wages	255
Rent and Rates	960
Fuel	225
Repairs and Depreciation	300
Sundry Expenses	228

- (a) Calculate the gross profit, net margin and net profit.  
 (b) Express each of them as a percentage of sales.

***Solution:***

<i>Hotel Cost Sheet</i>			
<i>Particulars</i>	₹	₹	%
<b>Sales</b>		<b>7200</b>	<b>100</b>
<b>Less: Cost of Food</b>			
Opening Stock	690		
<i>Add: Purchases</i>	2430		
	<b>3120</b>		

*Contd.*

<i>Less: Closing Stock</i>	540	<b>2580</b>	<b>35.83</b>
<b>Gross Profit</b>		<b>4620</b>	<b>64.17</b>
<b>Less: Labour Cost</b>			
Salaries and Wages		255	3.54
<b>After-wage Profit</b>		<b>4365</b>	<b>60.63</b>
<b>Less: Overheads</b>			
Rent and Rates	960		
Fuel	225		
Repairs and Depreciation	300		
Sundry Expenses	228	<b>1713</b>	<b>23.79</b>
<b>Net Profit</b>		<b>2652</b>	<b>36.84</b>

14. The following information is available from the books of Blue Star restaurant for the month of January:

	₹		₹
Opening stock	2400	Purchase of Provision	9600
Stock at the end	2100	Wages	4200
Rent	90	Gas and Electricity	60
Depreciation	120	Repairs and Renewals	60
Sundry Expenses	30	Printing and Stationery	20
Postage and Telephone	30	Sales	21,000
Staff meals	96		

- (a) Calculate the gross profit, net margin and net profit.  
 (b) Express each of them as a percentage of sales.

**Solution:**

<i>Hotel Cost Sheet</i>			
<i>Particulars</i>	₹	₹	%
<b>Sales</b>		<b>21,000</b>	<b>100.00</b>
<b>Less: Cost of Food</b>			
Opening Stock	2400		
<i>Add: Purchases</i>	9600		
	<b>12,000</b>		
<i>Less: Closing Stock</i>	2100		

*Contd.*



Less: Staff Meals	96	9804	46.69
GROSS PROFIT		11,196	53.31
<b>Less: Labour Cost</b>			
Wages	4200		
Staff Meals	96	4296	20.46
<b>After-wage Profit (Net Margin)</b>		6900	32.86
<b>Less: Overheads</b>			
Rent	90		
Gas and Electricity	60		
Depreciation	120		
Repairs and Renewals	60		
Postage and Telegram	30		
Printing and Stationary	20		
Sundry Expenses	30	410	1.95
<b>Net Profit</b>		6490	30.90

15. The following figures are extracted from the books of a restaurant for the month of June:

	₹		₹
Sales	32,000	Purchases	12,000
Stock on 1st March	1000	Stock on 31st March	900
Wages	5000	Salaries	1600
Rates and Taxes	700	Insurance	480
Lighting and Heating	600	Maintenance and Repairs	960
Guest food compliments	600	Depreciation	840
Office Expenses	3200	Staff Meals	620

- Prepare a Cost-Profit Statement showing the amounts against the elements of cost.
- Express each of the amounts of the main elements of cost and profit as a percentage of sales.

**Solution:**

Hotel Cost Sheet			
Particulars	₹	₹	%
<b>Sales</b>		32,000	100.00
<b>Less: Cost of Food</b>			
Opening Stock	1000		

Contd.

Add: Purchases	12,000		
	<b>13,000</b>		
Less: Closing Stock	900		
Less: Staff Meals	620		
Less: Guest Food Compliments	600	<b>10,880</b>	<b>34.00</b>
<b>Gross Profit</b>		<b>21,120</b>	<b>66.00</b>
<b>Less: Labour Cost</b>			
Wages	5000		
Salaries	1600		
Staff Meals	620	<b>7220</b>	<b>22.56</b>
<b>After wage Profit (Net Margin)</b>		<b>13,900</b>	<b>43.44</b>
<b>Less: Overheads</b>			
Rates and Taxes	700		
Insurance	480		
Depreciation	840		
Maintenance and Repairs	960		
Lighting and Heating	600		
Office Expenses	3200		
Guest Food Compliments	600	<b>7380</b>	<b>23.06</b>
<b>Net Profit</b>		<b>6520</b>	<b>20.38</b>

16. Work out the food cost for the month from the figures given below:

Purchases during the month	₹ 21,000
Stock on 1st of the month	₹ 900
Stock on the end of the month	₹ 1200
Cost of staff meals for the month	₹ 640

**Solution:**

<i>Food Cost</i>	₹
Opening Stock	900
Add: Purchases	21,000
	<b>21,900</b>

*Contd.*

Less: Closing Stock	1200
Less: Staff Meals	640
<b>Total Food Cost</b>	<b>20,060</b>

17. The sales of restaurant in July amount to ₹ 30,000, food cost is ₹ 12,000, labour cost is ₹ 6000 and overhead cost is ₹ 9000. How much net profit has been made by the restaurant in the month of July? What is the percentage of food cost incurred in the month?

**Solution:**

<i>Hotel Cost Sheet (July)</i>	₹	%
Sales	30,000	100
Less: Food Cost	12,000	40
<b>Gross Profit</b>	<b>18,000</b>	<b>60</b>
Less: Labour Cost	6000	20
<b>After wage Profit</b>	<b>12,000</b>	<b>40</b>
Less: Overheads	9000	30
<b>Net Profit</b>	<b>3000</b>	<b>10</b>

$$\begin{aligned}
 \text{Food Cost \%} &= \frac{\text{Food Cost}}{\text{Sales}} \times 100 \\
 &= \frac{12,000}{30,000} \times 100 \\
 &= \mathbf{40\%}
 \end{aligned}$$

18. The cost of employing staff in restaurant is expected to be ₹ 24,000 for the next year and overhead will amount to ₹ 36,000. What gross profit must be achieved in order to make a net profit of ₹ 9000?

**Solution:**

$$\begin{aligned}
 \text{Gross Profit} &= \text{Labour Cost} + \text{Overheads} + \text{Net Profit} \\
 &= 24,000 + 36,000 + 9000 = \mathbf{₹ 69,000}
 \end{aligned}$$

19. Calculate the gross profit percentage of sales for each of the following:

- (a) Sales ₹ 49,000, food cost ₹ 21,000, labour cost ₹ 14,000 and overhead cost ₹ 7000  
 (b) Food cost ₹ 20,000, labour cost ₹ 25,000, overhead cost ₹ 15,000, net profit ₹ 10,000.

**Solution:**

- (a) **Gross Profit** = Sales – Food Cost  
 $= 49,000 - 21,000 = \mathbf{₹ 28,000}$

$$\begin{aligned}\text{Gross Profit \%} &= \frac{\text{Gross Profit}}{\text{Sales}} \times 100 \\ &= \frac{28,000}{49,000} \times 100 \\ &= 57.14\%\end{aligned}$$

(b) **Gross Profit** = Sales – Food Cost

Sales = Food Cost + Labour Cost + Overheads + Net profit

20,000 + 25,000 + 15,000 + 10,000 = ₹ 70,000

Gross Profit = 70,000 – 20,000 = ₹ 50,000

$$\begin{aligned}\text{Gross Profit \%} &= \frac{\text{Gross Profit}}{\text{Sales}} \\ &= \frac{50,000}{70,000} \times 100 \\ &= 71.43\%\end{aligned}$$

20. From the following accounts balances extracted from the books of accounts of a catering establishment, you are required to:

- Calculate food cost, labour cost and overhead and express each of them as a percentage of sales.
- Also, find out gross profit, after-wage profit, and net profit and express them as a percentage on sales.

	₹
Opening balance of Food	2200
Purchases	35,000
Wages and Salaries	18,000
Sales	1,20,000
Closing Inventory	3000
Staff Uniform	1200
Depreciation	8000
Stationery	10,000
Staff Accommodation	9000
Telephone	6000
General Office Expenses	11,000
E.S.I	600
Gratuity	1200

Out of food consumed, food worth ₹ 1000 was consumed by staff.

**Solution:**

<i>Hotel Cost Sheet</i>			
<i>Particulars</i>	₹	₹	%
<b>Sales</b>		<b>1,20,000</b>	<b>100.00</b>
<b>Less: Cost of Food</b>			
Opening Stock	2200		
Add: Purchases	35,000		
	<b>37,200</b>		
Less: Closing Stock	3000		
Less: Staff Meals	1000	<b>33,200</b>	<b>27.67</b>
<b>Gross Profit</b>		<b>86,800</b>	<b>72.33</b>
<b>Less: Labour Cost</b>			
Wages and Salaries	18,000		
Staff Uniform	1200		
Staff Accommodation	9000		
E.S.I.	600		
Gratuity	1200		
Staff Meals	1000	<b>31,000</b>	<b>25.83</b>
<b>After-Wage Profit (Net Margin)</b>		<b>55,800</b>	<b>46.5</b>
<b>Less: Overheads</b>			
Stationery	10,000		
Telephone	6000		
Depreciation	8000		
General Office Expenses	11,000	<b>35,000</b>	<b>29.17</b>
<b>Net Profit</b>		<b>20,800</b>	<b>17.33</b>

### Objective Type Questions

Fill in the blanks:

- \_\_\_\_\_ is a statement showing the details of the total cost of the job, order or operation.
- \_\_\_\_\_ means the recording of time of worker's arrival at and departure from the hotel for the purpose of attendance and wage calculations.

- (c) \_\_\_\_\_ Time Clocks are digital attendance systems that allows people to clock in/out by authenticating characteristics on a person finger, palm or hand print.
- (d) \_\_\_\_\_ time means that time for which wages are paid but no production is obtained.
- (e) When workers work for more than the normal hours, the excess time is known as \_\_\_\_\_.

### Review Questions

1. What is a cost sheet?
2. What is the need for a cost sheet?
3. What are the objectives of food cost sheet?
4. What are the objectives of food costing or material costing?
5. What are the elements of food cost?
6. What are the advantages of a food cost sheet?
7. What is gross profit or gross margin?
8. What is meant by time keeping?
9. What is meant by time booking?
10. What do you mean by
  - (a) Dial time recorder
  - (b) Key recorded system
  - (c) Punch card time clock
  - (d) Digital electronic time clock
  - (e) Biometric time clock
11. Write a note on the different mechanized methods of time keeping.
12. What is a wage abstract?
13. What is idle time? How is it treated in cost accounts?
14. What is overtime?
15. What is labour turnover?
16. What are the causes and effects of labour turnover?
17. Explain the methods of measuring labour turnover.
18. What is fringe benefit?
19. Who is a casual worker and who is an out worker?
20. What is after-wage profit? How is it calculated?
21. What is overhead? List ten overhead items in the hotel industry.
22. Write short notes on the importance of food cost and describe at least three different ways to control it.
23. Briefly explain the advantages of food cost control in hotels and catering establishments.
24. What do you mean by
  - (a) Portion control
  - (b) Standard recipe

## Exercises

### Ingredient Cost Sheet

1. The following ingredients are necessary to produce twelve portions of Sole Colbert:

Dover Sole	12 × 400 gm	@ ₹ 220 per kg
Butter	200 gm	@ ₹ 135 per kg
Flour	300 gm	@ ₹ 20 per kg
Eggs	3 Nos	@ ₹ 58 per doz.
Loaf	1 No.	@ ₹ 22 per loaf
Lemons	4 Nos.	@ ₹ 8 each
Frying Oil		
(of which 10% is absorbed)	5 litre	@ ₹ 60 per litre
Parsley	1 spring	@ ₹ 4 per spring

You are required to:

- (i) Prepare the ingredient cost sheet.
  - (ii) Find out the cost per cover.
  - (iii) Calculate the gross profit percentage on sale which will be achieved if the selling price is ₹ 220 per cover.
  - (iv) What increase in the selling price per cover would be necessary to produce a gross profit of 60% on sales?
2. The ingredients necessary to produce twelve portions of Filet de sole Bonne Femme are as follows:

Dover Sole	6 × 500 gm	@ ₹ 220 per kg
Onions	100 gm	@ ₹ 46 per kg
Shallots	100 gm	@ ₹ 85 per kg
Mushrooms	500 gm	@ ₹ 140 per kg
White wine	1 bottle	@ ₹ 92 per bottle
Butter	350 gm	@ ₹ 135 per kg
Cream	3 dl.	@ ₹ 115 per litre
Eggs	3 Nos.	@ ₹ 58 per doz.
Parsley	50 gm	@ ₹ 14 per kg

You are required to:

- (a) Prepare a dish costing sheet.
  - (b) Calculate the total food cost.
  - (c) Calculate the food cost per cover.
  - (d) Find out the gross profit percentage gained if the dish is sold at ₹ 200 per cover.
3. The following quantities are required to produce twelve portions of Flan Aux Pommes:

Flour	300 gm	@ ₹ 20 per kg
Margarine	150 gm	@ ₹ 108 per kg

Sugar	80 gms @ ₹ 39 per kg
Eggs	2 Nos. @ ₹ 58 per doz.
Cooking Apples	1.8 kg @ ₹ 40 per kg
Lemon	1 No. @ ₹ 8 each
Granulated Sugar	200 gms @ ₹ 28 per kg
Apricot Jam	200 gms @ ₹ 56 per kg

Prepare the dish costing sheet, calculate food cost per portion, and find out the selling price per portion if a supplement of 140% on food cost is to be used.

4. A chef required the following ingredients to produce four portions of chicken and bacon pie:

1.25 kg	Chicken	@ ₹ 110 per kg
225 gms	Flour (bread)	@ ₹ 35 per kg
125 gms	pastry margarine	@ ₹ 64 per kg
100 gms	Bacon	@ ₹ 18 per kg
25 gms	Cake margarine	@ ₹ 60 per kg
25 gms	Onion	@ ₹ 20 per kg
50 gms	Chopped onion	@ ₹ 15 per kg
1 No.	Egg	@ ₹ 15 per dozen

Sundries: Estimated cost ₹ 5

You are required to:

- Find the cost per portion.
  - Find the selling price per portion to achieve a profit of 60% on the selling price.
  - If the selling price per portion was 50, what was the profit as a percentage on the selling price?
5. The following ingredients are required to produce 20 portions of Navarin of Lamb:

2.5 kg of Middle neck of Lamb	@ ₹ 30 per kg
400 gms onions	@ ₹ 6 per kg
4 leeks	@ ₹ 2 each
2 small heads celery	@ ₹ 2 each
500 gms button mushrooms	@ ₹ 12 per kg
500 gms button onions	@ ₹ 24 per kg
2 bunches parsley	@ ₹ 2.50 each

You are required to calculate:

- The total cost of the ingredients used.
  - The average cost per portion.
  - Assuming the food cost at 30%, the selling price per portion.
6. Following are the ingredients required to produce 10 portions of Apple Tarts:

Flour	300 gms @ ₹ 5 per kg
Margarine	150 gms @ 30 per kg



Powder Sugar	70 gm	@ ₹ 7 per kg
Egg	2 Nos.	@ ₹ 1 each
Apples	1500 gm	@ ₹ 18 per kg
Grain Sugar	200 gm	@ ₹ 7 per kg
Lemon	1 No.	@ ₹ 0.50 each
Apricot Jam	200 gm	@ ₹ 32 per kg

You are required to:

- Find the cost per 25 portions.
  - Calculate cost per portion.
  - Calculate the cost for each portion if the apples were ₹ 20 per kg.
7. Following are the ingredients required to prepare 6 portions of Sweet Buns:

Flour	250 gm	@ ₹ 5 per kg
Milk	50 ml	@ ₹ 8 per lit
Yeast	15 gm	@ ₹ 10 per 500 gm
Sugar	50 gm	@ ₹ 7 per kg
Fat	30 gm	@ ₹ 30 per kg
Raisins	30 gm	@ ₹ 70 per kg
Egg	1 no.	@ ₹ 10 per doz.

Your are required to:

- Calculate cost per portion.
  - Calculate cost of 15 portions.
  - Calculate the cost per portion if the
    - Cost of eggs is ₹ 8 per doz.
    - Cost of raisins is ₹ 50 per kg.
8. From the following information supplied to you by Apali Restaurant you are required to find the selling price per portion to earn a gross profit of 68% on the selling price.

Name of the dish: Seal View

No. of portions: 10

Ingredients:

Butter	120 gm	@ ₹ 142 per kg
Basin	300 gm	@ ₹ 28 per kg
Onions	135 gm	@ ₹ 35 per kg
Ginger	50 gm	@ ₹ 30 per kg
Garlic	20 gm	@ ₹ 58 per kg
Paneer	200 gm	@ ₹ 165 per kg
Potatoes	180 gm	@ ₹ 15 per kg
Peas	60 gm	@ ₹ 33 per kg
Pinch of salt		₹ 1

9. From the following information, prepare ingredients cost sheet along with the selling price per portion to earn a profit of 68% on the selling price.

Name of the Dish: Chauli-bean foogath

No. of portions: 10

Ingredients:

(a) Chauli beans	0.57 kg	@ 40/kg
(b) Coconut	0.125 kg	@ ₹ 20/kg
(c) Cumin	5 gm	@ ₹ 25/kg
(d) Turmeric	1 gm	@ ₹ 120/kg
(e) Mustard seeds	5 gm	@ ₹ 50/kg
(f) Onions	11.5 gm	@ ₹ 24 /kg
(g) Curry leaves (few springs)		₹ 0.21
(h) Oil	25 ml	@ ₹ 120/lit
(i) Salt	10 gm	@ ₹ 5/kg

### Hotel Cost Sheet

10. Calculate the gross profit from the following information: The labour cost for the year ₹ 18,000 and the overhead will amount to ₹ 23,000. The net profit for the year is ₹ 12,000.
11. Calculate the gross profit and percentage of gross profit from the given information: Sales ₹ 59,000, food cost ₹ 18,000, labour cost ₹ 12,000 and overheads ₹ 8000.
12. From the following information, calculate the gross profit percentage: Net profit ₹ 13,000, food cost ₹ 15,000, overhead ₹ 12,000, labour cost ₹ 30,000.
13. Calculate food cost for the month of April from the figures given below:

Purchases during the month	₹ 16,000
Stock on 1st April 2008	₹ 1800
Stock at the end of the month	₹ 2300
Cost of staff meals	₹ 1700

14. The total sales of "A" restaurant in the month of March amount to ₹ 50,000. The food cost is ₹ 21,000, labour cost is ₹ 8000 and overhead cost is ₹ 6000. Calculate the net profit of the restaurant for the month of March. Also, calculate the percentage of food cost incurred in that month.
15. The total sales of "A" restaurant in the month of March amount to ₹ 62,000. The food cost is ₹ 18,000, labour cost is ₹ 10,000 and overhead cost is ₹ 8000. Calculate the net profit of the restaurant for the month of March. Also, calculate the percentage of food cost incurred in that month.
16. Calculate food cost from the following information:  
Purchases during the month ₹ 28,000, opening stock ₹ 12,000, staff meals ₹ 5600, and closing stock ₹ 8800.
17. From the following particulars, calculate the percentage of gross profit and percentage of after-wage profit:

Opening stock	₹ 12,000	Salaries	₹ 40,000
Purchase	₹ 3,30,000	Return outwards	₹ 12,000
Staff Meals	₹ 20,000	Closing stock	₹ 1,20,000
Sales	₹ 4,50,000		

18. The following information is available from the books of “Five” Star restaurant for the month of April 2008.

Sales	₹ 37,000	Staff meals	₹ 150
Printing and stationary	₹ 200	Rent	₹ 990
Opening Stock	₹ 4200	Salaries	₹ 4900
Repairs and Renewals	₹ 150	Sundry Expenses	₹ 170
Stock at end	₹ 5600	Depreciation	₹ 150
Heat and Light	₹ 360	Purchase	₹ 14,600
Postage and Telephone	₹ 150		

Calculate percentage of gross profit, percentage after-wage profit and percentage net profit.

19. Prepare a hotel cost sheet from the following:

Sales	₹ 10,800	Opening Stock	₹ 750
Other Expenses	₹ 340	Rent and Rates	₹ 1070
Purchase	₹ 2850	Gas	₹ 260
Repairs and Maintenance	₹ 430	Salaries	₹ 300
Closing Stock	₹ 800		

Also calculate percentage of gross Profit, percentage after-wage profit and percentage of net profit.

20. From the following figures, prepare a hotel cost sheet:

Sales	₹ 56,000	Stock on 31 Jan 2008	₹ 4000
Salaries	₹ 4400	Staff Meals	₹ 2200
Office Expenses	₹ 4180	Purchase	₹ 20,000
Wages	₹ 7000	Stock on 1st Jan 2008	₹ 13,000
Insurance	₹ 500	Guest food compliments	₹ 1800
Lighting and Heating	₹ 370	Maintenance	₹ 450
Depreciation	₹ 300	Rent and Rate	₹ 1900

Also calculate percentage of gross profit, percentage after-wage profit and percentage of net profit.

21. From the following, calculate food cost, labour cost and overhead and also find out percentage gross profit, percentage after-wage profit, and percentage net profit.

Opening balance of Food	₹ 2200
Purchases	₹ 35,000
Wages and Salaries	₹ 18,000

Sales	₹ 1,20,000
Closing Inventory	₹ 3000
Staff Uniform	₹ 1200

22. From the following information which is extracted from the books of a restaurant for the month of September, 2007, you are required to prepare hotel cost sheet along with gross profit percentage, after-wage profit percentage and net profit percentage.

	₹
Opening Stock	24,000
Purchases	71,000
Sales	1,57,000
Purchase returns	2000
Sales returns	3000
Payroll and related expenses	18,000
Maintenance	3000
Administrative expenses	9000
Rates and Taxes	4800
Depreciation	3200
Staff welfare expenses	1500
Closing stock	21,000

23. The following cost data has been extracted from the records of a restaurant for the month of January 2005:

	₹
Opening Stock	24,000
Material Cost	1,05,000
Wages Cost	60,000
Gas and Electricity	8000
Printing and Stationery	2000
Postage	500
Telephone	1500
Insurance	10,000
Depreciation	8000
Sales	3,00,000
No. of Covers	1500

You are required to calculate the following:

- Average selling price per cover and net profit per cover.
  - Elements of costs, kitchen profit and net profit as a percentage of sales.
  - Cost and profit composition in each ₹ 1 of sales.
24. From the following information, prepare a statement of costs and profit for the month of June, showing what the amount of each main heading represents as a percentage of sales:

	₹
Sales	3150
Purchase of Food	1420
Purchase returns	30
Stock at 1st June	120
Stock at 30th June	130
Wages	695
Workers health Insurance	70
Rent and Taxes	130
Fire Insurance	15
Depreciation	95
Lighting and heating	86
Van Expenses	20
Repairs and Maintenance	64
Renewals	40
Laundry and cleaning	48
Printing and Stationery	30
Telephone	30
Advertising	15
Professional fees	5
Interest on Capital	40
Sundry expenses	12
Cost of Staff meals	150

25. The following information is related to Palmiah Hotel for the year 1989. You are required to calculate:

- Food cost, labour cost, and overhead. Express each of them as a percentage of sales.
- Gross profit, after-wage profit, and net profit. Express each of them as a percentage of sales.
- Average Spending Power

	₹		₹
Opening Stock	2000	P.F.	2000
Purchases	80,000	E.S.I.C.	800
Sales	2,00,000	Staff meals	1200
Purchase Returns	500	Depreciation	4000
Closing Stock	1000	Printing and Stationery	3000
Wages and Salaries	30,000	Rent, Rates and Taxes	5000
Number of covers served	2000		

26. The following information is extracted from the books of a restaurant. You are required to calculate food cost, labour cost, and overhead, and express each of them as a percentage of sales.

	₹
Opening Stock	1500
Purchases	40,000
Closing Stock	1000
Wages and Salaries	15,000
P.F.	800
E.S.I.C.	500
Bonus	700
Printing and Stationery	5000
Rent, Rates and Taxes	3000
Depreciation	2000
Sales	1,00,000
Adjustments:	

From the above period staff meals and complementary food amounted to ₹ 500 and ₹ 800, respectively.

27. The following information has been extracted from the books of Evergreen restaurant for the year 2004. Prepare a cost sheet and express material cost, labour cost, overheads and net profit as percentage on sales.

	₹		₹
Sales	40,000	Opening Stock	8000
Closing Stock	3000	Purchases	12,000
Wages	4500	E.S.I.	1200
Cleaning Charges	200	Telephone Charges	300
Rent	3500	Printing and Stationery	150
Electricity	300	Insurance	1000
Depreciation	1250	Staff meals	600

28. From the following information, you are required to calculate food cost, labour cost and overhead and express each of them as a percentage of sales. Also calculate gross profit, after-wage profit and net profit and express them as a percentage of sales.

	₹		₹
Opening Stock	1200	House Accommodation	3725
Purchases	28,750	Depreciation	3500
Purchases Returns	250	Stationery	1250
Sales	75,000	E.S.I	2875
Salary	11,000	Rent	300
Repairs	2800	Telephone Charges	870
Administrative Expenses	3200	Closing Stock	500

Out of food consumed, ₹ 1000 worth of food was used for staff meals.

29. Prepare cost and profit statement from the following:

(i) January 2003

Sales	₹ 37,500
Overheads	₹ 6750
Labour Cost	₹ 11,250
Food Cost	₹ 14,450

(ii) December 2002

Food Cost	₹ 24,960
Labour Cost	₹ 17,920
Overheads	₹ 15,520
Sales	₹ 16,400

30. The following information has been extracted from the records of the Humming Bee Restaurant for April 2003:

	₹
Sales	7200
Stock on 1.4.2003	690
Stock on 30.04.2003	540
Purchases	2430
Salaries and Wages	255
Rent and Rate	960
Fuel	225
Repairs and depreciation	300
Sundry Expenses	228

- Calculate gross profit, net margin and net profit.
- Express each of them as a percentage of sales.

# 3

## Chapter

# Inventory Management

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of purchasing function
- Purchase procedure
- Different stock levels
- Meaning and objects of stores ledger
- Different methods of valuing material issues
- Meaning and objectives of inventory control
- Various techniques of inventory control

### INTRODUCTION

Food and beverage commodities constitute one of the largest single cost classifications in a hotel business. A variation of one percent in the material costs will have a very significant affect on profit. The flows of food and beverage items have many sequential steps in the food and beverage operation as given below:

1. Purchasing
2. Receiving
3. Storing
4. Issuing
5. Processing
6. Preparation and positioning



7. Prepared
8. Service
9. Sales

## **PURCHASING**

Purchasing function is full of risks and very often rash purchases are made at prohibitive cost and in excess of the requirements which could turn into absolute stock. There are different kinds of purchasing methods and procedures, such as hand to mouth purchasing, market purchasing, purchasing by requirements, scheduled purchasing, seasonal purchasing and tender purchasing.

The responsibilities of the purchasing department are as follows:

- (i) Analyse each purchase specification to determine if the ingredients and material specified therein are actually required and if more economical material could be substituted.
- (ii) Find out if the description of ingredients and material and other details are clear and complete in the purchase requisition.
- (iii) Select a proper supplier, taking into account the factors that make a good supplier.
- (iv) Purchase as per the purchase schedule, standard purchase specifications and the ABC analysis.
- (v) Consult the traffic department to determine the best mode of transportation available and insist on the supplier for appropriate packaging to ensure safety in transit.
- (vi) Obtain material in the required quantity at the lowest cost at the proper time and in quantities that support production.
- (vii) Keep inventory investment as low as possible.
- (viii) Forecast market conditions, supply and availability of ingredients and material and economic conditions.
- (ix) Work with suppliers and potential suppliers in search of new material and ingredient substitutes, improvements in methods, processes, techniques and equipment, product designs, taste, flavour, etc.

## **INVENTORY**

Inventory is a quantity or store of goods that is held for some purpose or use. (The term may also be used as a verb, meaning to take inventory or to count all goods held in inventory.) Inventory may be kept “in-house,” meaning on the premises or nearby for immediate use; or it may be held in a distant warehouse or distribution centre for future use. With the exception of firms utilizing just-in-time methods, more often than not, the term “inventory” implies a stored quantity of goods that exceeds what is needed for the firm to function at the current time (e.g. within the next few hours).

### **Stock (Inventory) Level**

There are different levels of stock maintained by an organization for the smooth operational purposes, such as Maximum Stock Level, Minimum Stock Level, Reorder Level, and Economic Order Quantity.

### **Maximum Stock Level**

The upper limit beyond which the quantity of any item is not normally allowed to rise is known as the “Maximum Level.” It is the sum total of the minimum quantity and the economic order quantity (EOQ). This level is fixed for avoiding overstock of materials. This level is decided after taking into consideration the consumption frequency, durability of the ingredients, amount of investment, availability of the ingredients, administrative cost in purchasing the ingredients more frequently and maximum order size for earning maximum discount on purchases and other benefits.

$$\text{Maximum Level} = \text{Reorder Level} + \text{Reorder Quantity} - (\text{Minimum Consumption} \times \text{Minimum Delivery Time})$$

### **Minimum Stock Level**

Minimum stock level is the lower limit below which the stock of any item of material should not be allowed to fall. This is essentially a safety stock, and hence it is not normally touched. It is the level of stock to be maintained at all times so that production and sales are not obstructed due to want of ingredients and material. This level also has to be decided after considering the frequency of consumption, value of stock and minimum time involved in getting fresh supplies. This minimum quantity must be sufficient enough to take care of the production needs, during the period of order placed for fresh supplies and receipt of the same.

$$\text{Minimum Level} = \text{Reorder Level} - (\text{Average Consumption} \times \text{Average Delivery Time})$$

### **Reorder Level of Stock**

Reorder level of stock is the level of stock between the maximum level and the minimum level, where a point is set at which orders for fresh supplies or ingredients must be placed with the suppliers, to ensure that the stock of ingredients arrives before the existing stock level falls below the minimum level.

$$\text{Reorder Level} = \text{Maximum Consumption} \times \text{Maximum Delivery Time}$$

### **Economic Order Quantity**

The quantity which is ordered when the stock of an item falls to the re-order level is known as re-order quantity or Economic Order Quantity (EOQ) or standard order quantity or Economic Lot Size. Although it is not a stock level as such, the re-order quantity has a direct bearing upon the stock levels.

$$\text{EOQ} = \frac{\sqrt{2AO}}{C}$$

where

EOQ = Economic Order Quantity

A = Annual Consumption in units

O = Ordering cost per order

C = Cost of carrying inventory per unit.

**Safety Stock**

Safety stock represents the quantity below which the stock should not be allowed to fall. It is otherwise known as *buffer stock*, or *minimum stock level*.

**Order Point**

Order point is that at which the storekeeper should initiate the purchase requisition for fresh supplies of the material.

**Lead Time**

Lead time is the time lag between intending (either a purchase order or a production order issued to the shop or the factory floor) and receiving of the material. If a supplier (an external firm or an internal department or plant) cannot supply the required goods on demand, then the client firm must keep an inventory of the needed goods. The longer the lead time, the larger the quantity of goods the firm must carry in inventory.

**OTHER LOT-SIZING TECHNIQUES**

There are a number of other lot-sizing techniques available in addition to EOQ. These include fixed-order quantity, fixed-order-interval model, the single-period model, and part-period balancing.

**Fixed-order Quantity Model**

EOQ is an example of the fixed-order quantity model since the same quantity is ordered every time an order is placed. A firm might also use a fixed-order quantity when it is captive to packaging situations. If you were to walk into an office supply store and ask to buy 22 paper clips, chances are you would walk out with 100 paper clips. You were captive to the packaging requirements of paper clips, i.e., they come 100 to a box and you cannot purchase a partial box. It works the same way for other purchasing situations. A supplier may package his goods in certain quantities so that his customers must buy that quantity or a multiple of that quantity.

**Fixed-order Interval Model**

The fixed-order interval model is used when orders have to be placed at fixed time intervals such as weekly, biweekly, or monthly. The lot size is dependent upon how much inventory is needed from the time of order until the next order must be placed (order cycle). This system requires periodic checks of inventory levels and is used by many retail firms such as drug stores and small grocery stores.

**Single-period Model**

The single-period model is used in ordering perishables, such as food and flowers, and items with a limited life, such as newspapers. Unsold or unused goods are not typically carried over from one period to another and there may even be some disposal costs involved. This model tries to balance the cost of lost customer goodwill and opportunity cost that is incurred from not having enough inventory, with the cost of having excess inventory left at the end of a period.

## Part-period Balancing

Part-period balancing attempts to select the number of periods covered by the inventory order that will make total carrying costs as close as possible to the set-up/order cost.

When a proper lot size has been determined, utilizing one of the above techniques, the reorder point, or point at which an order should be placed, can be determined by the rate of demand and the lead time. If safety stock is necessary, it would be added to the reorder point quantity.

$$\text{Reorder point} = \text{Expected demand during lead time} + \text{Safety stock}$$

Thus, an inventory item with a demand of 100 per month, a two-month lead time and a desired safety stock of two weeks would have reorder point of 250. In other words, an order would be placed whenever the inventory level for that goods reached 250 units.

$$\text{Reorder point} = 100/\text{month} \times 2 \text{ months} + 2 \text{ weeks' safety stock} = 250$$

## PURCHASE REQUISITION

A purchase requisition is a formal request to buy materials (Fig. 3.1). In order to secure maximum control over purchase cost, all purchases must be based on purchase requisition made by authorized persons from respective production departments or stores, as the case may be. It is usually a printed form with columns meant for description, quantity size and grade of materials required. It must be authorized by a responsible officer.

<b>XYZ HOTELS LLD.</b> <b>PURCHASE REQUISITION</b>			
<b>To</b> <b>Store Keeper/Purchase Manager</b>			<b>P.R. No.:</b> _____ <b>Date:</b> _____
<b>Please arrange to procure the following on/by/before _____ required for consumption on/by/before _____</b>			
SI. No.	Ingredients/Materials	Quantity	Description

**Figure 3.1** A Purchase Requisition

## PURCHASE ORDER

On the basis of the purchase requisition from the department concerned, or from the stores or in accordance with the purchase schedule, the purchase department must prepare an order on the supplier, for supply of material and ingredients. This order is known as *purchase order*, which is a request to the supplier to supply the ingredients and material as per instructions, terms and conditions mentioned therein (Fig. 3.2). Purchase order is made in four copies—one for stores, one for accounts, and one for purchase department.

<b>XYZ HOTELS LTD.</b> <b>PURCHASE ORDER</b>				
<b>To</b> <b>The Supplier</b> <b>Ref: _____</b>			<b>P.O. No.: _____</b> <b>Date: _____</b>	
Please supply the following on/by/before _____ as per the following instructions, terms and conditions.				
Sl. No.	Ingredients/ Material	Qty.	Rate	Remarks

**Figure 3.2** *A Purchase Order***MATERIAL REQUISITION**

Material requisition is a formal request to issue the materials stating their description, quantity for a particular work order (Fig. 3.3). The material requisition note should be signed by the concerned officer requesting for the material and authorized by a higher authority.

<b>XYZ HOTELS LTD.</b> <b>MATERIAL REQUISITION</b>							
<b>M.R.No. _____</b> <b>Bin No. _____</b> <b>Job No. _____</b>						<b>Sl. No.: _____</b> <b>Date: _____</b>	
Please issue the following on/by/before _____ for production to begin on/by/before _____							
Sl. No.	Description of Material	Code No.	Qty. Required	Qty. Issued	Rate	Amount	Remarks

**Figure 3.3** *Material Requisition***BIN-CARD**

Once the ingredients and materials are received, they are placed in the bin, and the details of the materials must be recorded in the bin-card immediately. Bin-card is a card hung or hooked or attached outside the bin, representing and identifying the bin, which records the physical

movements of ingredients and materials in and out of the bin, and it shows the balance of stores in physical quantity at any point of time (Fig. 3.4).

<b>BIN-CARD</b>							
Name of Ingredient: _____				Bin No.: _____			
Quality: _____		Size _____		Weight _____			
Colour _____		Code _____		Unit _____			
Count _____		Brand _____		Make _____			
Maximum Level _____		Minimum level _____		Re-order level _____			
Stores ledger Folio _____							

Date	Receipts		Issues		Balance		Remarks
	G.R. No.	Qty.	M.R. No.	Qty.	Qty.	Sd	

**Figuer 3.4** A Bin-card

## STORES LEDGER

Stores ledger is a ledger maintained by the stores department, where the details of the ingredients and materials received by the stores, issued by the stores to various departments and the balance available in the stores are mentioned.

### Objectives of Stores Ledger

- (i) It helps in the preparation of various periodical stock statements for the purpose of food costing and control.
- (ii) It helps in the valuation of material as and when necessary.
- (iii) It helps to check the minimum level and the maximum levels of stock.
- (iv) It helps to know the re-ordering level of stock.
- (v) It helps in avoiding over-stocking as well as under-stocking.

<b>STORES LEDGER</b>		
S.L.F. No. _____	Material _____	Brand _____
Bin Card No. _____	Make _____	Size _____
Bin No. _____	Unit _____	Colour _____
Count _____	Code _____	E.O.Q. _____
Min. Level _____	Max. Level _____	Re-order level _____

*Contd.*

<i>Date</i>	<i>Receipts</i>				<i>Issue</i>				<i>Balance</i>		
	<i>G.R. No.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>	<i>M.R. No.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>

## METHODS OF VALUING MATERIAL ISSUES

Materials issued from the stores are debited to the jobs or work orders which received them and credited to the materials account. These jobs are debited with the value of materials issued to them. A good method of valuing material issues should satisfy the following conditions:

1. The issue price should recover the cost price of the materials.
2. The issue price must be near the market price.
3. The issue price should not lead to any significant variation in the cost of similar jobs from period so far as materials are concerned; otherwise comparison on similar jobs will become difficult.
4. The issue price should not necessitate heavy adjustments in values of stock of materials in the stores ledger at the end of the year, thus making the stores ledger complicated.

### First in First Out (FIFO)

Under FIFO method, materials are issued in the order in which the lots are received, i.e. the first lot that comes in should be issued first, then the second lot, and so on. When issues are made from the first lot, the cost at which the lot was purchased is used for the pricing the issues until the whole lot is exhausted. This principle is that, First-in, First-out or First come First served.

### Advantages

1. It is simple to understand and easy to operate.
2. It is a logical method.
3. Since the materials are issued at the purchase price, the cost of works or jobs can be ascertained correctly.
4. This method is useful when prices are falling.
5. Closing stock of materials will be valued at the market price.
6. This method is suitable for limited transactions and when prices are fairly stable.

### Disadvantages

1. Possibility of clerical errors.
2. Due to price fluctuations, the comparison between one job and the other job becomes difficult because one job started a few minutes later than another of the same nature may be issued at different prices.

3. For pricing one requisition, more than one price has often to be taken.
4. In the case of price rise, it does not reflect the market price as materials are issued from the earliest consignments.

### **Last in First Out (LIFO)**

Under LIFO method, material issues are valued at latest purchase price on the assumption that material bought last has been issued first. In this method, the lot that is received last naturally to placed on top of the heap. Issues should be made only from this lot, and when the whole lot gets exhausted, the preceding lot should be used for issue purposes. This method is also known as the *replacement cost method* because the materials are issued at the current cost to jobs or work orders except when purchases were made long ago. This method was first introduced in the USA during the Second World War to get the advantages of rising prices.

#### **Advantages**

- (i) It is simple to operate and useful when less number of transactions are there and prices are stable.
- (ii) This method recovers cost from production as actual cost of material is charged to production.
- (iii) This method is suitable when the prices are rising because the materials are issued at the current market prices which are high.

#### **Disadvantages**

- (i) Clerical errors.
- (ii) Comparison between one job and other job becomes difficult due to price fluctuations.
- (iii) For pricing a single requisition, more than one price has often to be adopted.
- (iv) The stock in hand is valued at a price which does not reflect the current market price. Hence, closing stock will be understated or overstated in the Balance Sheet.

### **Average Cost Method**

Average cost method is based on the principle that all the materials in the store are so mixed up that an issue cannot be made from any particular lot of purchases and, therefore, it is proper to issue these materials at the average cost of materials in store.

There are two types of average costs:

- (i) **Simple average cost:** “A price which is calculated by dividing the total of the prices of the materials in the stock from which the material to be priced could be drawn by the number of the prices used in that total.”

Simple average price is calculated by dividing the total unit purchase of different lots in stock on the date of issue. The number of prices used in the calculation and quantity of different lots is ignored.

This method is not commonly followed because this method of calculating issue price does not recover the cost price of the materials from the production.



- (ii) **Weighted average cost:** “A price which is calculated by dividing the total cost of materials in the stock from which the materials to be priced could be drawn by the total quantity of materials in that stock.”

This method takes into account the price and quantity of material in store. This method is a better one because it recovers the cost price of the materials from production.

### **Advantages**

- (i) This method is systematic, rational and not subject to manipulation.
- (ii) This method is a suitable method during price fluctuations.
- (iii) Issue prices are not calculated each time issues are made. Issue prices are calculated only when a new lot of materials is received.
- (iv) It recovers the cost of materials from production.
- (v) Issue prices are near the market prices.
- (vi) It eliminates the necessity for adjustments in stock valuation.

### **Disadvantages**

- (i) Fresh rate calculation is required as soon as a new lot of materials is purchased.
- (ii) Issue price of materials does not represent the actual cost of materials issued; rather, it represents the average cost of materials in store.

## **INVENTORY (MATERIAL) CONTROL**

Inventory control means each item of stores is checked frequently with the records maintained to ascertain whether the stock of quantities shown in the record is in agreement with the actual physical stock or not. In the case of any variation, the causes of variances are to be found and necessary corrective actions are taken.

### **Objectives of Inventory Control**

- (i) **Availability of materials:** In order to avoid the bottlenecks in production, a minimum quantity of material is fixed to permit production to move on as per schedule.
- (ii) **No excessive investment in materials:** In order to avoid over-stocking, a maximum quantity is assigned to each item of material above which the stock should not exceed.
- (iii) **Reasonable price:** Without compromising on quality, the purchase of materials is to be made at a reasonably low price.
- (iv) **Minimum wastage:** Another objective of material control is to avoid abnormal wastages (like theft, leakage, etc.) during storing by the storekeeper and production by the workers. Proper training has to be given to the storekeeper and the workers in this regard so as to handle the materials in a scientific way.
- (v) **Risks of spoilage and obsolescence of materials to be avoided:** For this purpose, the maximum quantity of materials is determined and a proper method of issue is followed (FIFO) depending upon the perishability nature of the materials.

- (vi) **Information about availability of materials:** The storekeeper must maintain up-to-date record of the material availability. The details should be made available to the management so as to continue the production without any bottleneck.
- (vii) **Avoid misappropriation of materials:** Proper internal check has to be maintained so that there is no misappropriation of material.

### ABC Analysis

Under the ABC analysis system ('A'lways, 'B'etter, 'C'ontrol), materials are classified into the following three categories:

**A-Category** The materials which are costly are grouped as A category and a greater degree of care is taken in their preservation and use. They constitute 70% to 80% of the total cost of the product, but their number constitutes only 5% to 10% of the stores.

**B-Category** Certain materials, which may constitute 10% to 20% of the total inventory, may account for 20% to 25% of the total value. These are put in B-category and a reasonable degree of care and control may be exercised for these.

**C-Category** This category constitutes 70% of stores, but has 5–10% of the total value which requires minimum check.

The ABC analysis may also be called selective value approach, proportional parts value approach, or HMC (High, Medium, and Low) value analysis. Thus, under this method varied degrees of care and control may be exercised for the different categories of materials according to their value.

### Advantages of ABC Analysis

- (i) It ensures a closer and more strict control over such items as are having sizable investment in them.
- (ii) It reduces inventory carrying cost.
- (iii) It releases working capital.
- (iv) It enables the maintenance of a high inventory turnover rate.

### PERPETUAL INVENTORY SYSTEM

Perpetual Inventory System is “a system of records maintained by the controlling department which reflects the physical movement of stocks and their current balance” (ICMA-London). It is a system of ascertaining the balance after every receipt and issue of the materials through stock records to facilitate regular checking and to avoid closing down the firm for stocktaking. The Bin Cards and Stores Ledger help to ensure the accuracy of this system. Sometimes, there may be differences in the balance between the Bin Cards and Stores ledger, which is due to the following avoidable and unavoidable causes.

### Avoidable Causes

- (i) Clerical mistakes
- (ii) Pilferage and thefts

- (iii) Carelessness in material handling
- (iv) Short or over-issue of materials

### **Unavoidable Causes**

- (i) Actual balance may be less due to shrinkage and evaporation.
- (ii) Actual balance may be more due to absorption of moisture.
- (iii) Actual balance may be less due to breakdown of fire, riots etc.
- (iv) Material may be lost due to breaking up bulk material into smaller parts of issue.

### **Operation of Perpetual Inventory System**

- (i) The stock records are maintained and up-to-date posting of transactions is made therein so that current balance may be known at any time.
- (ii) Different sections of stores are taken up by rotation for physical checking.
- (iii) Stores received but waiting inspection are not mixed up with regular stores at the time of physical verification.
- (iv) Notice of the particular items to be verified each day is given to the storekeeper only on the date of actual verification so that surprise element in stock verification may be maintained.
- (v) The physical stock available in the store, after counting, weighing, measuring or listing, as the case may be, is properly recorded in bin cards or inventory tags or stock verification sheets.

### **ADVANTAGES OF PERPETUAL INVENTORY SYSTEM**

- (i) It obviates the necessity for the physical checking of all items of stores at the end of the year and thereby avoids dislocation of production.
- (ii) It is possible to prepare periodical P/L A/c and Balance Sheet without physical inventory being taken because figure for the closing stock can be taken from the bin cards or the stores ledger.
- (iii) A detailed and more reliable check on the store is obtained.
- (iv) The figures shown by this system are more reliable.
- (v) The records can be kept more accurately and up-to-date.
- (vi) Planning of production can be done according to the availability of the material in the stores.
- (vii) A system of internal check remains in operation all the time.
- (viii) Errors and shortage of stock are readily discovered and the efforts are made to avoid the shortage of stock in future.
- (ix) The capital investment in stores can be kept under control.
- (x) Correct stock figures are available for claim to be lodged with the insurance company for loss on account of stock destroyed by fire or accident.

### **VED ANALYSIS**

Vital, Essential and Desirable (VED) analysis is a method of control used for control of spare parts. We can divide the spare parts into vital, essential or desirable, keeping in view the criticality of production.

## OTHER TYPES OF STOCKS

- **Slow Moving Stocks:** Slow moving stocks are those items of stocks which are not issued at frequent intervals. The issues of such items are irregular and are not made at normal intervals.
- **Dormant Stocks:** Dormant stocks are those items of stores which are rarely issued from the store. Consumption of such items is almost nil. These items are stored for emergency.
- **Obsolete Stocks:** Obsolete stocks are those items of stores which have become outdated and have no further use for the purpose they are purchased. Stocks may become obsolete because of changes in product design or methods of production, use of substitute materials, discontinuation of a product, etc.

### Flow Chart of Essentials of Material Control (Store Routine)

<i>Material Planning</i>	<i>Material Purchasing</i>	<i>Material Storing</i>	<i>Material Issuing</i>	<i>Material Accounting</i>
1. Centralized or Decentralized Purchasing	Ascertaining requirement of materials	Location and layout of stores	Material requisition	Receipts materials
2. Classification and Codification	Exploring sources of supply	Maintenance of stores records	Bill of materials	Issue of materials
3. Standardization and simplification	Calling quotations	Perpetual inventory system	Materials returned to stores	Losses
4. Types of stores Centralized/ decentralized stores	Preparing comparative statement of quotations	Calculation of inventory turn-over ratio for ascertainment slow moving, and obsolete materials	Transfer of materials to other job or department	
5. Fixation of levels	Making a choice of the most suitable supplier and placing order with him		Loss of materials	
6. Selective control through ABC analysis	Receiving and inspecting materials		Surplus of materials	
7. VED analysis	Checking and passing of bills for payment			
8. Perpetual Inventory System				

**ILLUSTRATIONS****Inventory Levels**

1. Two components X and Y are used as follows:

Normal Usage	300 units per week each
Maximum Usage	450 units per week each
Minimum Usage	150 units per week each
Re-order quantity	X–2400 units Y–3600 units
Re-order period	X–4 to 6 weeks Y–2 to 4 weeks

Calculate: (a) Re-order Level, (b) Minimum Level, (c) Maximum Level, and (d) Average Stock Level.

***Solution:***

- (a) **Reorder Level of Stock:**

Reorder Level = Maximum Consumption  $\times$  Maximum Delivery Time

$$X: 450 \times 6 = 2700 \text{ units} \quad Y: 450 \times 4 = 1800 \text{ units}$$

- (b) **Minimum Stock Level:**

Minimum Level = Reorder Level – (Average Consumption  $\times$  Average Delivery Time)

$$X: 2700 - (300 \times 5) = 1200 \text{ units} \quad Y: 1800 - (300 \times 3) = 900 \text{ units}$$

(Average Delivery Time A:  $4 + 6/2 = 5$  and B:  $2 + 4/2 = 3$ )

- (c) **Maximum Stock Level:**

Maximum Level = Reorder Level + Reorder Quantity – (Minimum consumption  $\times$  Minimum Delivery Time)

$$X: 2700 + 2400 - (150 \times 4) = 4500 \text{ units} \quad Y: 1800 + 3600 - (150 \times 2) = 5100 \text{ units}$$

- (d) **Average Stock Level:**

Minimum Stock Level + Maximum Stock Level/2

$$X: 1200 + 4500/2 = 2850 \text{ units} \quad Y: 900 + 5100/2 = 3000 \text{ units}$$

2. Two Components A and B are used as follows:

Normal Usage	50 units per week
Minimum Usage	25 units per week
Maximum Usage	75 units per week
Re-order Quantity	A–300 units B–500 units
Delivery Time	A–4 to 6 weeks B–2 to 4 weeks

Calculate: (a) Re-order Level, (b) Minimum Level, (c) Maximum Level, and (d) Average Stock Level.

**Solution:**

(a) **Reorder Level of Stock:**

Reorder Level = Maximum Consumption  $\times$  Maximum Delivery Time

$$A: 75 \times 6 = 450 \text{ units} \quad B: 75 \times 4 = 300 \text{ units}$$

(b) **Minimum Stock Level:**

Minimum Level = Reorder Level – (Average Consumption  $\times$  Average Delivery Time)

$$A: 450 - (50 \times 5) = 200 \text{ units} \quad B: 300 - (50 \times 3) = 150 \text{ units}$$

$$(\text{Average Delivery Time } A: 4 + 6/2 = 5 \text{ and } B: 2 + 4/2 = 3)$$

(c) **Maximum Stock Level:**

Maximum Level = Reorder Level + Reorder Quantity – (Minimum consumption  $\times$  Minimum Delivery Time)

$$A: 450 + 300 - (25 \times 4) = 650 \text{ units} \quad B: 300 + 500 - (25 \times 2) = 750 \text{ units}$$

(d) **Average Stock Level:**

Minimum Stock Level + Maximum Stock Level/2

$$A: 200 + 650/2 = 425 \text{ units} \quad B: 150 + 750/2 = 450 \text{ units}$$

3. From the following particulars, calculate:

(a) Re-order Level, (b) Minimum Level, and (c) Maximum Level.

Normal Usage	100 units per day
Minimum Usage	60 units per day
Maximum Usage	130 units per day
Economic Order Quantity	5000 units
Re-order period	25 to 30 days

**Solution:**

Economic order quantity is same as re-order quantity.

(a) **Reorder Level of Stock:**

Reorder Level = Maximum Consumption  $\times$  Maximum Delivery Time

$$130 \times 30 = 3900 \text{ units}$$

(b) **Minimum Stock Level:**

Minimum Level = Reorder Level – (Average Consumption  $\times$  Average Delivery Time)

$$3900 - (100 \times 27.5) = 1150 \text{ units}$$

$$(\text{Average Delivery Time } 25 + 30/2 = 27.5)$$

(c) **Maximum Stock Level:**

Maximum Level = Reorder Level + Reorder Quantity – (Minimum consumption  $\times$  Minimum Delivery Time)

$$3900 + 5000 - (60 \times 25) = 7400 \text{ units}$$

4. Find out the minimum level, maximum level and ordering level from the following particulars:

Minimum consumption	100 units per day
Maximum consumption	175 units per day
Normal consumption	125 units per day
Re-order quantity	1500 units
Minimum period for receiving goods	7 days
Maximum period for receiving goods	15 days
Normal period of receiving goods	10 days

**Solution:**

(a) **Reorder Level of Stock:**

$$\text{Reorder Level} = \text{Maximum Consumption} \times \text{Maximum Delivery Time}$$

$$175 \times 15 = 2625 \text{ units}$$

(b) **Minimum Stock Level:**

$$\text{Minimum Level} = \text{Reorder Level} - (\text{Normal Consumption} \times \text{Normal Delivery Time})$$

$$2625 - (125 \times 10) = 1375 \text{ units}$$

(c) **Maximum Stock Level:**

$$\text{Maximum Level} = \text{Reorder Level} + \text{Reorder Quantity} - (\text{Minimum Consumption} \times \text{Minimum Delivery Time})$$

$$2625 + 1500 - (100 \times 7) = 3425 \text{ units}$$

5. Calculate maximum level, minimum level and reordering level from the following data:

Re-order quantity	1500 units
Re-order period	4 to 6 weeks
Maximum consumption	400 units per week
Normal consumption	300 units per week
Minimum consumption	250 units per week

**Solution:**

(a) **Reorder Level of Stock:**

$$\text{Reorder Level} = \text{Maximum Consumption} \times \text{Maximum Delivery Time}$$

$$400 \times 6 = 2400 \text{ units}$$

(b) **Minimum Stock Level:**

$$\text{Minimum Level} = \text{Reorder Level} - (\text{Average Consumption} \times \text{Average Delivery Time})$$

$$2400 - (300 \times 5) = 900 \text{ units}$$

$$(\text{Average Delivery Time} = 4 + 6/2 = 5)$$

(c) **Maximum Stock Level:**

$$\text{Maximum Level} = \text{Reorder Level} + \text{Reorder Quantity} - (\text{Minimum Consumption} \times \text{Minimum Delivery Time})$$

$$2400 + 1500 - (250 \times 4) = 2900 \text{ units}$$

6. From the following particulars, calculate the economic order quantity:

Annual requirements	1600 units
Cost of materials	₹ 40
Cost of placing and receiving one order	₹ 50
Annual carrying cost of inventory	10% of inventory value

**Solution:**

$$EOQ = \frac{\sqrt{2AO}}{C}$$

where

EOQ = Economic Order Quantity

A = Annual Consumption in units

O = Ordering cost per order

C = Cost of carrying inventory per unit

$$\begin{aligned} \frac{\sqrt{2AO}}{C} &= \sqrt{\frac{2 \times 1600 \times 50}{4}} \\ &= \sqrt{\frac{16,000}{4}} \\ &= 200 \text{ units} \end{aligned}$$

7. Calculate EOQ from the following:

Consumption during the year	600 units
Ordering cost	₹ 12 per order
Carrying cost	20%
Price per unit	₹ 20

**Solution:**

$$\begin{aligned} EOQ &= \sqrt{\frac{2AO}{C}} \\ &= \sqrt{\frac{2 \times 600 \times 12}{4}} \\ &= 60 \text{ units} \end{aligned}$$

8. A restaurant requires 500 units of a certain material for a year. The cost of carrying one unit of this material is calculated to be ₹ 1 per annum and it is estimated that the expenses placing an order and receiving would amount to ₹ 10. Calculate EOQ.

**Solution:**

$$\begin{aligned} EOQ &= \sqrt{\frac{2AO}{C}} \\ &= \sqrt{\frac{2 \times 500 \times 10}{1}} \\ &= 100 \text{ units} \end{aligned}$$



9. Find out EOQ from the following particulars:

Annual Usage	1,20,000 units
Cost of placing one order	₹ 60
Annual Carrying cost	10% of inventory value

**Solution:**

$$\begin{aligned}
 \text{EOQ} &= \sqrt{\frac{2AO}{C}} \\
 &= \sqrt{\frac{2 \times 1,20,000 \times 60 \times 100}{10}} \\
 &= 12,000 \text{ units}
 \end{aligned}$$

10. Find out the EOQ from the following particulars:

Annual Usage	6000 units
Cost of material per unit	₹ 20
Cost of placing and receiving one order	₹ 60
Annual Carrying cost of one unit	10% of inventory

**Solution:**

$$\begin{aligned}
 \text{EOQ} &= \sqrt{\frac{2AO}{C}} \\
 &= \sqrt{\frac{2 \times 6000 \times 60}{2}} \\
 &= 600 \text{ units}
 \end{aligned}$$

### Stores Ledger Register

11. ABC Co. Ltd. had 300 units of a particular raw material at the end of 1992, all of which were purchased at ₹ 10 per unit. During 1993, the following purchases were made:

April	200 units @ ₹ 9.00 per unit
May	100 units @ ₹ 8.50 per unit
June	200 units @ ₹ 8.00 per unit
July	300 units @ ₹ 7.75 per unit
August	200 units @ ₹ 7.10 per unit

At the end of 1993, there were 350 units in hand. Compute the inventory under

(a) LIFO, (b) FIFO, (c) Simple Average price and (d) Weighted Average Price

**Solution:****(a) STORES LEDGER**

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

**LIFO**

<i>Date</i>	<i>Receipts</i>				<i>Issues</i>				<i>Balance</i>		
	<i>GR. No.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>	<i>MR. No.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amt.</i>
March									300	10.00	3000
April		200	9.00	1800					300	10.00	3000
									200	9.00	1800
May		100	8.50	850					300	10.00	3000
									200	9.00	1800
									100	8.50	850
June		200	8.00	1600					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
July		300	7.75	2325					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
									300	7.75	2325
August		200	7.10	1420					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
									300	7.75	2325
									200	7.10	1420
August						200	7.10	1420			
						300	7.75	2325			
						200	8.00	1600			
						100	8.50	850			
						150	9.00	1350			
									<b>300</b>	<b>10.00</b>	<b>3000</b>
									<b>50</b>	<b>9.00</b>	<b>450</b>

Closing Stock is valued under LIFO 300 units @ ₹ 10.00 amounting to ₹ 3000, 50 units @ ₹ 9.00 amounting to ₹ 450. Total 350 units amounting to ₹ 3450.

**(b) STORES LEDGER**

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
March									300	10.00	3000
April		200	9.00	1800					300	10.00	3000
									200	9.00	1800
May		100	8.50	850					300	10.00	3000
									200	9.00	1800
									100	8.50	850
June		200	8.00	1600					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
July		300	7.75	2325					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
									300	7.75	2325
August		200	7.10	1420					300	10.00	3000
									200	9.00	1800
									100	8.50	850
									200	8.00	1600
									300	7.75	2325
									200	7.10	1420

Contd.

August						300	10.00	3000			
						200	9.00	1800			
						100	8.50	850			
						200	8.00	1600			
						150	7.75	1162.50	<b>150</b>	<b>7.75</b>	<b>1162.50</b>
									<b>200</b>	<b>7.10</b>	<b>1420.00</b>

Closing Stock is valued under FIFO 150 units @ ₹ 7.75 amounting to ₹ 1162.50, 200 units @ ₹ 7.10 amounting to ₹ 1420. Total 350 units amounting to ₹ 2582.50.

### (c) STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

### Simple Average Price

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty	Rate	Amt.
March											
April		200	9.00	1800					300	10.00	3000
May		100	8.50	850					500		4800
June		200	8.00	1600					600		5650
July		300	7.75	2325					1100		9575
August		200	7.10	1420					1300		10,995
August						950	8.39	7970.50	<b>350</b>		<b>30.2450</b>

Closing Stock is valued under Simple Average Price 350 units amounting to ₹ 3024.50.

### Working Notes:

Issue Price in Auguts:  $\frac{10 + 9 + 8.50 + 8 + 7.75 + 7.10}{6} = ₹ 8.39$

## (d) STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

**Weighted Average Price**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
March									300	10.00	3000
April		200	9.00	1800					500		4800
May		100	8.50	850					600		5650
June		200	8.00	1600					800		7250
July		300	7.75	2325					1100		9575
August		200	7.10	1420					1300		10,995
August						950	8.46	8037	<b>350</b>		<b>2958</b>

Closing Stock is valued under Weighted Average Price 350 units amounting to ₹ 2958.

**Working Notes:**

Issue price in August: Cost of Material in Store/Quantity of Material in Store

$$10,995/1300 = 8.46$$

12. During a period of three weeks, the purchase and usage of cans of tomato juice in a restaurant were as follows:

	Purchased	Used
Week 1	20 cans @ ₹ 20 each	12 cans
Week 2	30 cans @ ₹ 24 each	25 cans
Week 3	40 cans @ ₹ 28 each	40 cans

Find the consumption figures in each of the following methods of valuing issues:

- (i) FIFO, (ii) LIFO and (iii) Average cost

**Solution:****(a) STORES LEDGER**

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Week 1		20	20	400		12	20	240	20 8	20 20	400 160
Week 2		30	24	720		8 17	20 24	160 408	8 30 13	20 24 24	160 720 312
Week 3		40	28	1120		13 27	24 28	312 756	13 40 13	24 28 28	312 1120 364

Closing Stock is valued under FIFO 13 units @ ₹ 28 amounting to ₹ 364.

**(b) STORES LEDGER**

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

**LIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Week 1		20	20	400		12	20	240	20 8	20 20	400 160

*Contd.*

Week 2		30	24	720					8	20	160
						25	24	600	30	24	720
									8	20	160
									5	24	120
Week 3		40	28	1120		40	28	1120	40	28	1120
									8	20	160
									5	24	120

Closing Stock is valued under LIFO 8 units @ ₹ 20 amounting to ₹ 160, 5 units @ ₹ 24 amounting to ₹ 120. Total 13 units amounting to ₹ 280.

### (c) STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

### Average Cost

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Week 1		20	20	400		12	20	240	20		400
									8		160
Week 2		30	24	720		25	23.16	579	38		880
									13		301
Week 3		40	28	1120		40	26.81	1072.40	53		1421
									13		348.60

Closing Stock valued under Average Cost is 13 units amounting to ₹ 348.60.

### Working Notes:

Issue price for week 2 = Cost of materials in store/Quantity of materials in store

$$880/38 = 23.16$$

Issue price for week 2 = Cost of materials in store/Quantity of materials in store

$$1421/53 = 26.81$$

13. Write a stores ledger card in proper form making use of the following particulars, pricing issues on the principle of **FIFO, LIFO** and **AVERAGE COST**:

Date	Transaction	Qty. in Units	Rate/Unit (₹)
Jan. 1	Balance	500	20
3	Issues	300	
6	Purchases	800	22
8	Issues	400	
12	Issues	300	
14	Purchases	400	25
20	Issues	600	
24	Purchases	500	28
25	Issues	300	
28	Issues	100	

The stock verifier found a shortage of 10 units on 30th and left a note.

**Solution:**

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### FIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	20	10,000
Jan. 3						300	20	6000	200	20	4000
Jan. 6		800	22	17,600					200	20	4000
									800	22	17,600

*Contd.*



Jan. 8						200 200	20 22	400 4400	600	22	13,200
Jan. 12						300	22	6600	300	22	6600
Jan. 14		400	25	10,000					300 400	22 25	6600 10,000
Jan. 20						300 300	22 25	6600 7500	100	25	2500
Jan. 24		500	28	14,000					100 500	25 28	2500 14,000
Jan. 25						100 200	25 28	2500 5600	300	28	8400
Jan. 28						100	28	2800	<b>200</b>	<b>28</b>	<b>5600</b>

Closing Stock is valued under FIFO 200 units @ ₹ 28 amounting to ₹ 5600.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### LIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	20	10,000
Jan. 3						300	20	6000	200	20	4000
Jan. 6		800	22	17,600					200 800	20 22	4000 17,600
Jan. 8						400	22	8800	200 400	20 22	4000 8800
Jan. 12						300	22	6600	200 100	20 22	4000 2200

Contd.

Jan. 14		400	25	10,000					200 100 400	20 22 25	4000 2200 10,000
Jan. 20						400 100 100	25 22 20	10,000 2200 2000			
Jan. 24		500	28	14,000					100 500	20 28	2000 14,000
Jan. 25						300	28	8400	100 200	20 28	2000 5600
Jan. 28						100	28	2800	<b>100</b> <b>100</b>	<b>20</b> <b>28</b>	<b>2000</b> <b>2800</b>

Closing Stock is valued under LIFO 100 units @ ₹ 20 amounting to ₹ 2000 and 100 units @ ₹ 28 amounting ₹ 2800. Total 200 units amounting ₹ 4800.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Simple Average Cost

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	20	10,000
Jan. 3						300	20	6000	200	20	4000
Jan. 6		800	22	17,600					1000		21,600
Jan. 8						400	21	8400	600		13,200
Jan. 12						300	22	6600	300		6600
Jan. 14		400	25	10,000					700		16,600
Jan. 20						600	23.5	14,100	100		2500

Contd.

Jan. 24		500	28	14,000					600		16,500
Jan. 25						300	26.5	7950	300		7950
Jan. 28						100	26.5	2650	<b>200</b>		<b>5300</b>

Closing Stock is valued under SIMPLE AVERAGE COST 200 units amounting to ₹ 5300.

### Working Notes:

Issue price on Jan. 8th =  $20 + 22/2 = ₹ 21$

Issue price on Jan. 12th = ₹ 22

Issue price on Jan. 20th =  $22 + 25/2 = ₹ 23.50$

Issue price on Jan. 25th =  $25 + 28/2 = ₹ 26.50$

Issue price on Jan. 28th =  $25 + 28/2 = ₹ 26.50$

14. The following is the record of receipts and issues of certain material during a week in the month of May 1994:

- May 1 Opening balance, 100 units @ ₹ 20.20 per unit  
 1 Issued 60 units  
 2 Received 120 units at ₹ 20.20 per units  
 3 Received back from order 20 units (originally issued at ₹ 19.80 per unit)  
 4 Issued 50 units  
 5 Issued 80 units  
 6 Received 44 units at ₹ 20.40 per unit  
 7 Issued 66 units

Adopt **LIFO and FIFO** methods and show the pricing of materials in the stores ledger account

### Solution:

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### FIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
May 1									100	20.20	2020

Contd.

May 1						60	20.20	1212	40	20.20	808
May 2		120	20.20	2424					40	20.20	808
									120	20.20	2424
May 3		20	19.80	396					40	20.20	808
									120	20.20	2424
									20	19.80	396
May 4						40	20.20	808	110	20.20	2222
						10	20.20	202	20	19.80	396
May 5						80	20.20	1616	30	20.20	606
									20	19.80	396
May 6		44	20.40	897.6					30	20.20	606
									20	19.80	396
									44	20.40	897.6
May 7						30	20.20	606			
						20	19.80	396			
						16	20.40	326.4	<b>28</b>	<b>20.40</b>	<b>571.20</b>

Closing Stock is valued under FIFO 28 units @ ₹ 20.40 amounting to ₹ 571.20.

## STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

## LIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
May 1									100	20.20	2020
May 1						60	20.20	1212	40	20.20	808
May 2		120	20.20	2424					40	20.20	808
									120	20.20	2424

Contd.

May 3		20	19.80	396					40 120 20	20.20 20.20 19.80	808 2424 396
May 4						20 30	19.80 20.20	396 606	40 90	20.20 20.20	808 1818
May 5						80	20.20	1616	40 10	20.20 20.20	808 202
May 6		44	20.40	897.6					40 10 44	20.20 20.20 20.40	808 202 897.6
May 7						44 10 12	20.40 20.20 20.20	897.6 202.0 242.4			
									<b>28</b>	<b>20.20</b>	<b>565.6</b>

Closing Stock is valued under LIFO 28 units @ ₹ 20.20 amounting to ₹ 565.60.

15. From the following details regarding receipts and issues of a material during the month of February 2004, calculate the quantity and value of the material in stock on 28th February:

February	Transaction	Units	Cost per unit (₹)
4	Receipt	300	3
5	Receipt	600	4
6	Issue	500	—
10	Receipt	700	4
15	Issue	800	—
19	Receipt	300	4.5
23	Issue	100	—

Show the stores ledger entries assuming (i) FIFO, (ii) LIFO, (iii) Simple Average Method and (iv) Weighted Average Method as the pricing systems.

**Solution:**

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 4		300	3.00	900					300	3.00	900
Feb. 5		600	4.00	2400					300 600	3.00 4.00	900 2400
Feb. 6						300 200	3.00 4.00	900 800	400	4.00	1600
Feb. 10		700	4.00	2800					400 700	4.00 4.00	1600 2800
Feb. 15						400 400	4.00 4.00	1600 1600	300	4.00	1200
Feb. 19		300	4.50	1350					300 300	4.00 4.50	1200 1350
Feb. 23						100	4.00	400	<b>200</b> <b>300</b>	<b>4.00</b> <b>4.50</b>	<b>800</b> <b>1350</b>

Closing Stock is valued under FIFO 200 units @ ₹ 4 amounting to ₹ 800 and 300 units @ ₹ 4.50 amounting to ₹ 1350 Total 500 units amounting to ₹ 2150.

**STORES LEDGER**

S.L.F. No. \_\_\_\_\_

Material \_\_\_\_\_

Brand \_\_\_\_\_

Bin No. \_\_\_\_\_

Make \_\_\_\_\_

Size \_\_\_\_\_

Bin Card No. \_\_\_\_\_

Unit \_\_\_\_\_

Colour \_\_\_\_\_

Count \_\_\_\_\_

Code \_\_\_\_\_

EOQ \_\_\_\_\_

Min. Level \_\_\_\_\_

Max. Level \_\_\_\_\_

Re-order Level \_\_\_\_\_

**LIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 4		300	3.00	900					300	3.00	900

*Contd.*

Feb. 5		600	4.00	2400					300 600	3.00 4.00	900 2400
Feb. 6						500	4.00	2000	300 100	3.00 4.00	900 400
Feb. 10		700	4.00	2800					300 100 700	3.00 4.00 4.00	900 400 2800
Feb. 15						700 100	4.00 4.00	2800 400	300	3.00	900
Feb. 19		300	4.50	1350					300 300	3.00 4.50	900 1350
Feb. 23						100	4.50	450	<b>300</b> <b>200</b>	<b>3.00</b> <b>4.50</b>	<b>900</b> <b>900</b>

Closing Stock is valued under LIFO 300 units @ ₹ 3 amounting to ₹ 900 and 200 units @ ₹ 4.50 amounting to ₹ 900. Total 500 units amounting to ₹ 1800.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Simple Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 4		300	3.00	900					300	3.00	900
Feb. 5		600	4.00	2400					900		3300
Feb. 6						500	3.50	1750	400		1550
Feb. 10		700	4.00	2800					1100		4350
Feb. 15						800	4.00	3200	300		1150

Contd.

Feb. 19		300	4.50	1350					600		2500
Feb. 23						100	4.25	425	<b>500</b>		<b>2075</b>

Closing stock valued under Simple Average Method is 500 units of ₹ 2075.

### Working Notes:

Issue price on Feb. 6th =  $3 + 4/2 = ₹ 3.50$

Issue price on Feb. 10th =  $4 + 4/2 = ₹ 4.00$

Issue price on Feb. 23rd =  $4 + 4.50 = ₹ 4.25$

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Weighted Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 4		300	3.00	900					300	3.00	900
Feb. 5		600	4.00	2400					900		3300
Feb. 6						500	3.67	1835	400		1465
Feb. 10		700	4.00	2800					1100		4265
Feb. 15						800	3.88	3104	300		1161
Feb. 19		300	4.50	1350					600		2511
Feb. 23						100	4.185	419	<b>500</b>		<b>2092</b>

Closing stock valued under Weighted Average Method is 500 units of ₹ 2092.

### Working Notes:

Issue price on 6th Feb.  $3300/900 = ₹ 3.67$

Issue price on 15th Feb.  $4265/1100 = ₹ 3.88$

Issue price on 23rd Feb.  $2511/600 = ₹ 4.185$



16. From the following information, prepare stores ledger using FIFO, LIFO, Simple Average and Weighted Average pricing methods.

January 1	Opening balance	500 units @ ₹ 4
5	Received from vendor	200 units @ ₹ 4.25
12	Received from vendor	150 units @ ₹ 4.10
20	Received from vendor	300 units @ ₹ 4.50
25	Received from vendor	400 units @ ₹ 4

Issues of materials were as follows:

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

**Solution:**

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### FIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	4.00	2000
Jan. 4						200	4.00	800	300	4.00	1200
Jan. 5		200	4.25	850					300	4.00	1200
									200	4.25	850
Jan. 10						300	4.00	1200			
						100	4.25	425	100	4.25	425
Jan. 12		150	4.10	615					100	4.25	425
									150	4.10	615
Jan. 15						100	4.25	425	150	4.10	615
Jan. 19						100	4.10	410	50	4.10	205
Jan. 20		300	4.50	1350					50	4.10	205
									300	4.50	1350

Contd.

Jan. 25		400	4.00	1600					50 300 400	4.10 4.50 4.00	205 1350 1600
Jan. 26						50 150	4.10 4.50	205 675	150 400	4.50 4.00	675 1600
Jan. 30						150 100	4.10 4.00	675 400	<b>300</b>	<b>4.00</b>	<b>1200</b>

Closing Stock valued under FIFO is 300 units @ ₹ 4 amounting to ₹ 1200.

### STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

### LIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	4.00	2000
Jan. 4						200	4.00	800	300	4.00	1200
Jan. 5		200	4.25	850					300 200	4.00 4.25	1200 850
Jan. 10						200 200	4.25 4.00	850 800	100	4.00	400
Jan. 12		150	4.10	615					100 150	4.00 4.10	400 615
Jan. 15						100	4.10	410	100 50	4.00 4.10	400 205
Jan. 19						50 50	4.10 4.00	205 200	50	4.00	200
Jan. 20		300	4.50	1350					50 300	4.00 4.50	200 1350

Contd.

Jan. 25		400	4.00	1600					50 300 400	4.00 4.50 4.00	200 1350 1600
Jan. 26						200	4.00	800	50 300 200	4.00 4.50 4.00	200 1350 800
Jan. 30						200 50	4.00 4.50	800 225	<b>50</b> <b>250</b>	<b>4.00</b> <b>4.50</b>	<b>200</b> <b>1125</b>

Closing Stock is valued under LIFO 50 units @ ₹ 4.00 amounting to ₹ 200 and 250 units @ ₹ 4.50 amounting to ₹ 1125. Total 300 units amounting to ₹ 1325.

### STORES LEDGER

S.L.F. No. \_\_\_\_\_ Material \_\_\_\_\_ Brand \_\_\_\_\_  
 Bin No. \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_  
 Bin Card No. \_\_\_\_\_ Unit \_\_\_\_\_ Colour \_\_\_\_\_  
 Count \_\_\_\_\_ Code \_\_\_\_\_ EOQ \_\_\_\_\_  
 Min. Level \_\_\_\_\_ Max. Level \_\_\_\_\_ Re-order Level \_\_\_\_\_

### Simple Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	4.00	2000
Jan. 4						200	4.00	800	300		1200
Jan. 5		200	4.25	850					500		2050
Jan. 10						400	4.125	1650	100		400
Jan. 12		150	4.10	615					250		1015
Jan. 15						100	4.175	418	150		547
Jan. 19						100	4.175	418	50		129
Jan. 20		300	4.50	1350					350		1479
Jan. 25		400	4.00	1600					750		3079
Jan. 26						200	4.30	860	550		2219
Jan. 30						250	4.25	1063	<b>300</b>		<b>1156</b>

Closing Stock is valued under Simple Average Method 300 units amounting to ₹ 1156.

**Working Notes:**

Issue price on Jan. 10 :  $4 + 4.25 = 4.125$

Issue price on Jan. 15 :  $4.25 + 4.10 = 4.175$

Issue price on Jan. 19 :  $4.25 + 4.10 = 4.175$

Issue price on Jan. 26 :  $4.10 + 4.50 = 4.30$

Issue price on Jan. 30 :  $4.50 + 4.00 = 4.25$

**STORES LEDGER**

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**Weighted Average Method**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1									500	4.00	2000
Jan. 4						200	4.00	800	300		1200
Jan. 5		200	4.25	850					500		2050
Jan. 10						400	4.10	1640	100		410
Jan. 12		150	4.10	615					250		1025
Jan. 15						100	4.10	410	150		615
Jan. 19						100	4.10	410	50		205
Jan. 20		300	4.50	1350					350		1555
Jan. 25		400	4.00	1600					750		3155
Jan. 26						200	4.21	842	550		2313
Jan. 30						250	4.21	1.503	<b>300</b>		<b>810</b>

Closing Stock is valued under Simple Average Method 300 units amounting to ₹ 1156.

**Working Notes:**

Issue price on Jan. 10 :  $2050/500 = 4.10$

Issue price on Jan. 15 :  $1025/250 = 4.10$

Issue price on Jan. 19 :  $615/150 = 4.10$

Issue price on Jan. 26 :  $3155/750 = 4.21$

Issue price on Jan. 30 :  $2313/550 = 4.21$

17. Prepare the Stores Ledger Account from the following information using pricing of issues under FIFO, LIFO, Simple Average and Weighted Average methods:

**Receipt of Materials**

1st Jan.	300 tons @ ₹ 8 per ton
7th Jan.	200 tons @ ₹ 8.20 per ton
15th Jan.	250 tons @ ₹ 7.90 per ton
23rd Jan.	400 tons @ ₹ 7.50 per ton
28th Jan.	200 tons @ ₹ 7.70 per ton

**Issue of Materials**

5th Jan. 140 tons	8th Jan. 60 tons	15th Jan. 120 tons
18th Jan. 210 tons	22nd Jan. 200 tons	25th Jan. 150 tons
29th Jan. 240 tons		

**Solution:**

**STORES LEDGER**

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1		300	8.00	2400					300	8.00	2400
Jan. 5						140	8.00	1120	160	8.00	1280
Jan. 7		200	8.20	1640					160	8.00	1280
									200	8.20	1640
Jan. 8						60	8.00	480	100	8.00	800
									200	8.20	1640

*Contd.*

Jan. 15		250	7.90	1975					100 200 250	8.00 8.20 7.90	800 1640 1975
Jan. 15						100 20	8.00 8.20	800 164	180 250	8.20 7.90	1476 1975
Jan. 18						180 30	8.20 7.90	1476 237	220	7.90	1738
Jan. 22						200	7.90	1580	20	7.90	158
Jan. 23		400	7.50	3000					20 400	7.90 7.50	158 3000
Jan. 25						20 130	7.90 7.50	158 975	270	7.50	2025
Jan. 28		200	7.7	1540					270 200	7.50 7.7	2025 1540
Jan. 29						240	7.50	1800	<b>30</b> <b>200</b>	<b>7.50</b> <b>7.7</b>	<b>225</b> <b>1540</b>

Closing Stock is valued under FIFO 30 units @ ₹ 7.50 amounting to ₹ 225 and 200 units @ ₹ 7.70 amounting to ₹ 1540. Total 230 units amounting to ₹ 1765.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### LIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1		300	8.00	2400					300	8.00	2400
Jan. 5						140	8.00	1120	160	8.00	1280
Jan. 7		200	8.20	1640					160 200	8.00 8.20	1280 1640

Contd.

Jan. 8						60	8.20	492	160 140	8.00 8.20	1280 1148
Jan. 15		250	7.90	1975					160 140 250	8.00 8.20 7.90	1280 1148 1975
Jan. 15						120	7.90	948	160 140 130	8.00 8.20 7.90	1280 1148 1027
Jan. 18						130 80	7.90 8.20	1027 656	160 60	8.00 8.20	1280 492
Jan. 22						60 140	8.20 8.00	492 1120			
Jan. 23		400	7.50	3000					20 400	8.00 7.50	160 3000
Jan. 25						150	7.50	1125	20 250	8.00 7.50	160 1875
Jan. 28		200	7.7	1540					20 250 200	8.00 7.50 7.7	160 1875 1540
Jan. 29						200 40	7.7 7.50	1540 300	<b>20</b> <b>210</b>	8.00 7.50	<b>160</b> <b>1575</b>

Closing Stock is valued under LIFO 20 units @ ₹ 8.00 amounting to ₹ 160 and 210 units @ ₹ 7.50 amounting to ₹ 1575. Total 230 units amounting to ₹ 1735.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Simple Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1		300	8.00	2400					300		2400

Contd.

Jan. 5						140	8.00	1120	160		1280
Jan. 7		200	8.20	1640					360		2920
Jan. 8						60	8.10	486	300		2434
Jan. 15		250	7.90	1975					550		4409
Jan. 15						120	8.03	964	430		3445
Jan. 18						210	8.05	1691	220		1754
Jan. 22						200	7.90	1580	20		174
Jan. 23		400	7.50	3000					420		3174
Jan. 25						150	7.70	1155	270		2019
Jan. 28		200	7.7	1540					470		3559
Jan. 29						240	7.60	1824	<b>230</b>		<b>1735</b>

Closing Stock is valued under Simple Average Method 230 units amounting to ₹ 1735.

### Working Notes:

Issue price on Jan. 8th:  $8 + 8.20/2 = 8.10$

Issue price on Jan. 15th:  $8 + 8.20 + 7.90/3 = 8.30$

Issue price on Jan. 18:  $8.20 + 7.90/2 = 8.05$

Issue price on Jan. 22: 7.90

Issue price on Jan. 25:  $7.90 + 7.50/2 = 7.70$

Issue price on Jan. 29:  $7.50 + 7.70/2 = 7.60$

### STORES LEDGER

S.L.F. No. \_\_\_\_\_

Material \_\_\_\_\_

Brand \_\_\_\_\_

Bin No. \_\_\_\_\_

Make \_\_\_\_\_

Size \_\_\_\_\_

Bin Card No. \_\_\_\_\_

Unit \_\_\_\_\_

Colour \_\_\_\_\_

Count \_\_\_\_\_

Code \_\_\_\_\_

EOQ \_\_\_\_\_

Min. Level \_\_\_\_\_

Max. Level \_\_\_\_\_

Re-order Level \_\_\_\_\_

### Weighted Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Jan. 1		300	8.00	2400					300		2400

Contd.



Jan. 5						140	8.00	1120	160		1280
Jan. 7		200	8.20	1640					360		2920
Jan. 8						60	8.11	487	300		2433
Jan. 15		250	7.90	1975					550		4408
Jan. 15						120	8.02	962	430		3446
Jan. 18						210	8.01	1682	220		1764
Jan. 22						200	8.02	1604	20		160
Jan. 23		400	7.50	3000					420		3160
Jan. 25						150	7.52	1128	270		2032
Jan. 28		200	7.7	1540					470		3572
Jan. 29						240	7.60	1824	<b>230</b>		<b>1748</b>

Closing Stock is valued under Weighted Average Method 230 units amounting to ₹ 1748.

### Working Notes:

Issue price on Jan. 5:  $2400/300 = 8.00$

Issue price on Jan. 8:  $2920/360 = 8.11$

Issue price on Jan. 15:  $4408/550 = 8.02$

Issue price on Jan. 18:  $3446/430 = 8.01$

Issue price on Jan. 22:  $1764/220 = 8.02$

Issue price on Jan. 25:  $3160/420 = 7.52$

Issue price on Jan. 29:  $3572/470 = 7.60$

18. The stock in hand of a material as on 1st September was 500 units @ ₹ 1 per unit. The following purchases and issues were subsequently made. Prepare the Stores Ledger Account showing how the value of the issues would be recorded under FIFO, LIFO, Simple Average and Weighted Average methods.

Purchased				Issued	
Sept. 6	100 units	@ ₹ 1.10	Sept. 9	500 units	
Sept. 20	700 units	@ ₹ 1.20	Sept. 22	500 units	
Sept. 27	400 units	@ ₹ 1.30	Sept. 30	500 units	
Oct. 13	1000 units	@ ₹ 1.40	Oct. 15	500 units	
Oct. 20	500 units	@ ₹ 1.50	Oct. 22	500 units	
Nov. 17	400 units	@ ₹ 1.60	Nov. 11	500 units	

**Solution:****STORES LEDGER**

S.L.F. No. \_\_\_\_\_

Material \_\_\_\_\_

Brand \_\_\_\_\_

Bin No. \_\_\_\_\_

Make \_\_\_\_\_

Size \_\_\_\_\_

Bin Card No. \_\_\_\_\_

Unit \_\_\_\_\_

Colour \_\_\_\_\_

Count \_\_\_\_\_

Code \_\_\_\_\_

EOQ \_\_\_\_\_

Min. Level \_\_\_\_\_

Max. Level \_\_\_\_\_

Re-order Level \_\_\_\_\_

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Sept. 1									500	1.00	500
Sept. 6		100	1.10	110					500 100	1.00 1.10	500 110
Sept. 9						500	1.00	500	100	1.10	110
Sept. 20		700	1.20	840					100 700	1.10 1.20	110 840
Sept. 22						100 400	1.10 1.20	110 480	300	1.20	360
Sept. 27		400	1.30	520					300 400	1.20 1.30	360 520
Sept. 30						300 200	1.20 1.30	360 260	200	1.30	260
Oct. 13		1000	1.40	1400					200 1000	1.30 1.40	260 1400
Oct. 15						200 300	1.30 1.40	260 420	700	1.40	980
Oct. 20		500	1.50	750					700 500	1.40 1.50	980 750
Oct. 22						500	1.40	700	200 500	1.40 1.50	280 750
Nov. 11						200 300	1.40 1.50	280 450	200	1.50	300
Nov. 17		400	1.60	640					<b>200</b> <b>400</b>	<b>1.50</b> <b>1.60</b>	<b>300</b> <b>640</b>

Closing Stock is valued under FIFO 200 units @ ₹ 1.50 amounting to ₹ 300 and 400 units @ ₹ 1.60 amounting to ₹ 640. Total 600 units amounting to ₹ 940.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### LIFO

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Sept. 1									500	1.00	500
Sept. 6		100	1.10	110					500 100	1.00 1.10	500 110
Sept. 9						100 400	1.10 1.00	110 400	100	1.00	100
Sept. 20		700	1.20	840					100 700	1.00 1.20	100 840
Sept. 22						500	1.20	600	100 200	1.00 1.20	100 240
Sept. 27		400	1.30	520					100 200 400	1.00 1.20 1.30	100 240 520
Sept. 30						400 100	1.30 1.20	520 120	100 100	1.00 1.20	100 120
Oct. 13		1000	1.40	1400					100 100 1000	1.00 1.20 1.40	100 120 1400
Oct. 15						500	1.40	700	100 100 500	1.00 1.20 1.40	100 120 700

Contd.

Oct. 20		500	1.50	750					100	1.00	100
									100	1.20	120
									500	1.40	700
									500	1.50	750
Oct. 22						500	1.50	750	100	1.00	100
									100	1.20	120
									500	1.40	700
Nov. 11						500	1.40	700	100	1.00	100
									100	1.20	120
Nov. 17		400	1.60	640					<b>100</b>	<b>1.00</b>	<b>100</b>
									<b>100</b>	<b>1.20</b>	<b>120</b>
									<b>400</b>	<b>1.60</b>	<b>640</b>

Closing Stock is valued under LIFO 100 units @ ₹ 1.00 amounting to ₹ 100 100 units @ ₹ 1.20 amounting to ₹ 120 and 400 units @ ₹ 1.60 amounting to ₹ 640. Total 600 units amounting to ₹ 860.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Simple Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Sept. 1									500	1.00	500
Sept. 6		100	1.10	110					600		610
Sept. 9						500	1.05	525	100		85
Sept. 20		700	1.20	840					800		925
Sept. 22						500	1.15	575	300		350
Sept. 27		400	1.30	520					700		870
Sept. 30						500	1.20	625	200		245

Contd.

Oct. 13		1000	1.40	1400					1200		1645
Oct. 15						500	1.35	675	700		970
Oct. 20		500	1.50	750					1200		1720
Oct. 22						500	1.45	725	700		995
Nov. 11						500	1.45	725	200		270
Nov. 17		400	1.60	640					<b>600</b>		<b>910</b>

Closing stock is valued under Simple Average Method 600 units amounting to ₹ 910.

### Working Notes:

Issue price on Sept. 9:  $1.00 + 1.10/2 = 1.05$

Issue price on Sept. 22:  $1.10 + 1.20/2 = 1.15$

Issue price on Sept. 30: 1.20

Issue price on Oct. 15:  $1.30 + 1.40/2 = 1.35$

Issue price on Oct. 22:  $1.40 + 1.50/2 = 1.45$

Issue price on Nov. 11:  $1.40 + 1.50 = 1.45$

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Weighted Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Sept. 1									500	1.00	500
Sept. 6		100	1.10	110					600		610
Sept. 9						500	1.02	510	100		100
Sept. 20		700	1.20	840					800		940
Sept. 22						500	1.175	588	300		362
Sept. 27		400	1.30	520					700		872

Contd.

Sept. 30						500	1.25	625	200		247
Oct. 13		1000	1.40	1400					1200		1647
Oct. 15						500	1.37	685	700		962
Oct. 20		500	1.50	750					1200		1712
Oct. 22						500	1.43	715	700		997
Nov. 11						500	1.43	715	200		282
Nov. 17		400	1.60	640					<b>600</b>		<b>922</b>

Closing stock is valued under Weighted Average Method 600 units amounting to ₹ 922.

### Working Notes:

Issue price on Sept. 9:  $610/600 = 1.02$

Issue price on Sept. 22:  $940/800 = 1.175$

Issue price on Sept. 30:  $872/700 = 1.25$

Issue price on Oct. 15:  $1647/1200 = 1.37$

Issue price on Oct. 22:  $1712/1200 = 1.43$

Issue price on Nov. 11:  $997/700 = 1.43$

19. Show the Stores Ledger Account under FIFO, LIFO, Simple Average, and Weighted Average Method of pricing issues from the following information:

		Unit	Price (₹)
April 1	Balance in hand b/f	300	2.00
April 2	Purchased	200	2.20
4	Issued	150	
6	Purchased	200	2.30
11	Issued	150	
19	Issued	200	
22	Purchased	200	2.40
27	Issued	150	

### Solution:

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
April 1									300	2.00	600
April 2		200	2.20	440					300 200	2.00 2.20	600 440
April 4						150	2.00	300	150 200	2.00 2.20	300 440
April 6		200	2.30	460					150 200 200	2.00 2.20 2.30	300 440 460
April 11						150	2.00	300	200 200	2.20 2.30	440 460
April 19						200	2.20	440	200	2.30	460
April 22		200	2.40	480					200 200	2.30 2.40	460 480
April 27						150	2.30	345	<b>50</b> <b>200</b>	<b>2.30</b> <b>2.40</b>	<b>115</b> <b>480</b>

Closing Stock is valued under FIFO 50 units @ ₹ 2.30 amounting to ₹ 115 and 200 units @ ₹ 2.40 amounting to ₹ 480. Total 250 units amounting to ₹ 595.

**STORES LEDGER**

S.L.F. No. \_\_\_\_\_

Material \_\_\_\_\_

Brand \_\_\_\_\_

Bin No. \_\_\_\_\_

Make \_\_\_\_\_

Size \_\_\_\_\_

Bin Card No. \_\_\_\_\_

Unit \_\_\_\_\_

Colour \_\_\_\_\_

Count \_\_\_\_\_

Code \_\_\_\_\_

EOQ \_\_\_\_\_

Min. Level \_\_\_\_\_

Max. Level \_\_\_\_\_

Re-order Level \_\_\_\_\_

**LIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
April 1									300	2.00	600

Contd.

April 2		200	2.20	440					300 200	2.00 2.20	600 440
April 4						150	2.20	330	300 50	2.00 2.20	600 110
April 6		200	2.30	460					300 50 200	2.00 2.20 2.30	600 110 460
April 11						150	2.30	345	300 50 50	2.00 2.20 2.30	600 110 115
April 19						50 50 100	2.30 2.20 2.00	115 110 200	200	2.00	400
April 22		200	2.40	480					200 200	2.00 2.40	400 480
April 27						150	2.40	360	<b>200</b> <b>50</b>	<b>2.00</b> <b>2.40</b>	<b>400</b> <b>120</b>

Closing Stock is valued under LIFO 200 units @ ₹ 2.00 amounting to ₹ 400 and 50 units @ ₹ 2.40 amounting to ₹ 120. Total 250 units amounting to ₹ 620.

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Simple Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
April 1									300	2.00	600
April 2		200	2.20	440					500		1040
April 4						150	2.10	315	350		725

Contd.



April 6		200	2.30	460					550		1185
April 11						150	2.17	326	400		859
April 19						200	2.25	450	200		409
April 22		200	2.40	480					400		889
April 27						150	2.35	353	<b>250</b>		<b>536</b>

Closing stock is valued under Simple Average Method 250 units amounting to ₹ 536.

### Working Notes:

Issue price on April 4:  $2.00 + 2.20/2 = 2.10$

Issue price on April 11:  $2.00 + 2.20 + 2.30/3 = 2.17$

Issue price on April 19:  $2.20 + 2.20/2 = 2.20$

Issue price on April 27:  $2.30 + 2.40/2 = 2.35$

### STORES LEDGER

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

### Weighted Average Method

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
April 1									300	2.00	600
April 2		200	2.20	440					500		1040
April 4						150	2.08	312	350		728
April 6		200	2.30	460					550		1188
April 11						150	2.16	324	400		864
April 19						200	2.16	432	200		432
April 22		200	2.40	480					400		912
April 27						150	2.28	342	<b>250</b>		<b>570</b>

Closing stock is valued under Weighted Average Method 250 units amounting to ₹ 570.

**Working Notes:**

Issue price on April 4:  $1040/500 = 2.08$

Issue price on April 11:  $1188/550 = 2.16$

Issue price on April 19:  $864/400 = 2.16$

Issue price on April 27:  $912/412 = 2.28$

20. The following is the history of the receipts and issues of materials in a factory during February 2001.

Feb. 1	Opening Balance	500 kg @ ₹ 1
3	Issue	70 kg
4	Issue	100 kg
8	Issue	80 kg
13	Received from supplier	200 kg @ ₹ 2
14	Refund of surplus	15 kg @ ₹ 1
16	Issue	180 kg
20	Received from suppliers	250 kg @ ₹ 1.50
24	Issue	304 kg
25	Received from suppliers	320 kg @ ₹ 2.50
26	Issue	112 kg
27	Refund of surplus	12 kg
28	Returned to vendors	100 kg

Issued are to be priced on the principle of FIFO and LIFO methods. The stock verifier of the factory noticed that on the 25th, he had found a shortage of 6 kg and on the 27th another shortage of 8 kg. Prepare the Stores Ledger Account.

**Solution:****STORES LEDGER**

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**FIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 1									500	1.00	500

Contd.

Feb. 3						70	1	70	430	1	430
Feb. 4						100	1	100	330	1	330
Feb. 8						80	1	80	250	1	250
Feb. 13		200	2	400					250 200	1 2	250 400
Feb. 14	Refund	15	1	15					250 200 15	1 2 1	250 400 15
Feb. 16						180	1	180	70 200 15	1 1 1	70 200 15
Feb. 20		250	1.50	375					70 200 15 250	1 1 1 1.50	70 200 15 375
Feb. 24						70 200 15 19	1 1 1 1.50	70 200 15 28.50			
Feb. 25		320	2.50	800					231 320	1.5 2.50	346.50 800.00
Feb. 25					Shortage	6	1.50	9.00	225 320	1.50 2.50	337.50 800
Feb. 26						112	1.50	168	113 320	1.50 2.50	169.50 800.00
Feb. 27		12	2	24					113 320 12	1.50 2.50 2	169.50 800.00 24
Feb. 27					Shortage	8	1.50	12	105 320 12	1.50 2.50 2	157.50 800.00 24
Feb. 28					Returns	100	1.50	150	<b>5</b> <b>320</b> <b>12</b>	<b>1.50</b> <b>2.50</b> <b>2.00</b>	<b>7.50</b> <b>800.00</b> <b>24.00</b>

Closing Stock is valued under FIFO 5 units @ ₹ 1.50 amounting to ₹ 7.50, 320 units @ ₹ 2.50 amounting to ₹ 800 and 12 units @ ₹ 2.00 amounting to ₹ 24. Total 337 units amounting to ₹ 831.50.

**STORES LEDGER**

S.L.F. No. _____	Material _____	Brand _____
Bin No. _____	Make _____	Size _____
Bin Card No. _____	Unit _____	Colour _____
Count _____	Code _____	EOQ _____
Min. Level _____	Max. Level _____	Re-order Level _____

**LIFO**

Date	Receipts				Issues				Balance		
	GR. No.	Qty.	Rate	Amt.	MR. No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Feb. 1									500	1.00	500
Feb. 3						70	1	70	430	1	430
Feb. 4						100	1	100	330	1	330
Feb. 8						80	1	80	250	1	250
Feb. 13		200	2	400					250 200	1 2	250 400
Feb. 14	Refund	15	1	15					250 200 15	1 2 1	250 400 15
Feb. 16						15 165	1 2	15 330	250 35	1 2	250 70
Feb. 20		250	1.50	375					250 35 250	1 2 1.50	250 70 375
Feb. 24						250 35 19	1.50 2 1	375 70 19	231	1	231
Feb. 25		320	2.50	800					231 320	1 2.50	231 800.00
Feb. 25					Shortage	6	1.50	9.00	231 314	1 2.50	231 785

Contd.

Feb. 26						112	1.50	168	231 202	1 2.5	231 505
Feb. 27		12	2	24					231 202 12	1 2.5 2	231 505 24
Feb. 27					Shortage	8	1.50	12	231 202 4	1 2.5 2	231 505 8
Feb. 28					Returns	4 96	2 2.50	8 240	<b>231</b> <b>106</b>	1 2.50	231 265

Closing Stock is valued under FIFO 231 units @ ₹ 1 amounting to ₹ 231 and 106 units @ ₹ 2.50 amounting to ₹ 265. Total 337 units amounting to ₹ 496.

### Objective Type Questions

Fill in the blanks:

- The upper limit, beyond which the quantity of any item is not normally allowed to rise, is known as the “\_\_\_\_\_ level.”
- \_\_\_\_\_ level of stock is the level of stock between the maximum level and the minimum level, when orders for fresh supplies or ingredients must be placed with the suppliers.
- \_\_\_\_\_ time is the time lag between intending and receiving of the material.
- Under \_\_\_\_\_ method, materials are issued in the order in which the lots are received.
- Under \_\_\_\_\_ Inventory System balances are ascertained after every receipt and issue of the materials through stock records.

### Review Questions

- Explain the different stock levels and give the formulae.
- Explain the purchase procedure.
- What is:
  - EOQ
  - Safety Stock
  - Order Point
  - Lead Time
- Write short notes on:
  - Requisitions
  - Bin Card
  - Purchase Order
- Describe briefly how bin card system operates and state its advantages and disadvantages.
- What is the purpose of store requisition?

7. Explain the use of goods received book.
8. Differentiate between stock card and bin card.
9. What is FIFO? What are its advantages and disadvantages?
10. What is LIFO? What are its advantages and disadvantages?
11. What is average cost method of stores issues? What are its advantages and disadvantages?
12. Write a note on:
  - (a) ABC analysis
  - (b) Perpetual inventory system
  - (c) VED analysis
13. What is the purpose of material costing? Briefly state its advantages.
14. What is inventory control? What are the objectives of inventory control?
15. What is the meaning of:
  - (a) Blind receiving
  - (b) Kitchen profit
  - (c) Standard purchase specification.

### Exercises

1. From the following, calculate re-order level, maximum level and minimum level:

Maximum usage in a month—300 units

Minimum usage in a month—200 units

Average usage in a month—225 units

Time lag for procuring the material:

Maximum period: 6 months

Minimum period: 2 months

Re-order quantity: 750 units

2. In manufacturing its product, a company uses three raw materials A, B and C in respect of which the following apply:

<i>Raw materials</i>	<i>Usage per unit of Production</i>	<i>Re-order quantity</i>	<i>Price per lb</i>	<i>Delivery period</i>	<i>Order level</i>	<i>Minimum level</i>
	(lbs)	(lbs)	(paise)	(weeks)	(lbs)	(lbs)
A	10	10,000	10	1 to 3	8000	?
B	4	5000	30	3 to 5	4750	?
C	6	10,000	15	2 to 4	?	2000

Weekly production varies from 175 to 225 units, averaging 200. What would you expect the quantities of the following to be:

- (a) Maximum stock of A
- (b) Maximum stock of B
- (c) Reorder level of C
- (d) Average stock level at A

3. In a manufacturing company, a material was used as follows:

Maximum usage = 1200 units

Minimum usage = 400 units

Normal usage = 800 units

Reorder quantity = 4800 units

Reorder period = 4 to 6 weeks

Calculate:

- (a) Reorder level
- (b) Maximum level
- (c) Minimum level

4. The following is the details of receipts and issues of a material in a hotel:

2007 Jan. 1	Opening Balance 500 lit @ ₹ 25/lit
2	Issued 250 lit
10	Received from vendor 200 lit @ ₹ 24.50/lit
14	Refund of surplus form work-order 15 lit @ ₹ 24/lit
16	Issued 180 lit
22	Received from vendor 240 lit @ ₹ 24.37/lit
24	Issued 304 lit
25	Received from vendor 320 lit @ ₹ 24.30/lit
26	Issued 112 lit
27	Refund of surplus form work-order 12 lit @ ₹ 24.50/lit
28	Received from vendor 100 lit @ ₹ 24/lit
29	Returned to vendor 50 lit

The stock verification noted that on 15th January, there was a shortage of 5 lit, on 27th January another shortage of 8 lit and on 21st Jan., there was a surplus of 10 lit. Prepare a Stores Ledger Account under LIFO method.

5. The following transactions relate to purchase and issue of a material in Jay Ltd. during October 2007:

Receipts Dated	Quantity	Rate (₹)
4.10.2007	200 units	24.00 per unit
10.10.2007	150 units	23.00 per unit
18.10.2007	100 units	24.00 per unit
22.10.2007	100 units	23.50 per unit

Issues dated

05.10.2007	250 units
12.10.2007	200 units
25.10.2007	250 units

The stock on 1.10.2007 was 200 units at ₹ 25 per unit. Prepare Stores Ledger Account under FIFO Method.

6. Prepare the store ledger account on the basis of FIFO method:

January 1	Opening Stock	250 units	@ ₹ 1.00 each
January 3	Purchased	100 units	@ ₹ 1.05 each
January 4	Purchased	200 units	@ ₹ 1.05 each
January 6	Issued	400 units	
January 10	Purchased	400 units	@ ₹ 1.20 each
January 12	Issued	150 units	
January 13	Issued	100 units	
January 16	Purchased	100 units	@ ₹ 1.00 each
January 22	Purchased	200 units	@ ₹ 1.25 each
January 31	Issued	300 units	

7. The following are the figures about the receipt and issue of materials in M. Ltd. during January 2008:

January 1	Received	500 units	@ ₹ 2.00 each
January 18	Received	350 units	@ ₹ 2.10 each
January 19	Issued	600 units	
January 24	Received	600 units	@ ₹ 2.20 each
January 25	Issued	450 units	
January 26	Received	500 units	@ ₹ 2.30 each
January 29	Issued	510 units	

Prepare the Store Ledger Account on the basis of LIFO method.

8. From the following, prepare Stores Ledger Account by using LIFO method:

April 1	Stock in hand	500 units at ₹ 20 per unit
April 3	Issued	200 unit
April 3	Purchased	150 units at ₹ 22 per unit
April 4	Issued	100 units
April 5	Purchased	200 units at ₹ 25 per unit
April 6	Issued	300 unit
April 6	Returned to stores	10 units (issued on 4th April)
April 7	Issued	100 unit
April 8	Issued	50 unit

On 10th April, it was noticed that there is a shortage of 10 units.



9. Prepare a Stores Ledger Account from the following details using LIFO method of pricing the issue of materials:

March 1	Opening Balance 10,850 kg at ₹ 130 per kg
March 2	Purchased 20,000 kg at ₹ 134 per kg
March 3	Issued 6750 kg to production
March 5	Issued 8500 kg to production
March 6	Received back 550 kg from production being surplus
March 7	Purchased 17,550 kg at ₹ 128 per kg
March 8	Issued 11,250 kg to production.
March 9	Physical verification revealed a loss of 250 kg
March 10	Issued 8950 kg to production
March 12	Issued 6,300 kg to production
March 15	Purchased 10,000 kg at ₹ 132 per kg
March 16	Issued 7750 kg to production

10. The following is an extract of the records of the receipts and issues of a company during a month:

Feb. 1	Opening Balance	500 tones at ₹ 200
Feb. 3	Issued	70 tones
Feb. 4	Issued	100 tones
Feb. 8	Issued	80 tones
Feb. 13	Received	200 tones at ₹ 190
Feb. 14	Return form department	15 tones
Feb. 16	Issued	180 tones
Feb. 20	Received	240 tones at ₹ 190
Feb. 24	Issued	300 tones
Feb. 25	Received	320 tones at ₹ 190
Feb. 26	Issued	115 tones
Feb. 27	Returned form department	35 tones
Feb. 28	Received	100 tones at ₹ 190

Issues are to be priced on the principle of FIFO method. The stock verifier has found a shortage of 10 tones on the 22nd and left a note accordingly. Draw up a priced store ledger card for the material showing the above transactions.

11. The following is the record of receipts and issue of a certain material in the factory during a week:

April 2008

1	Opening Balance	50 tones at ₹ 10 per tone
	Issued	30 tones
2	Received	60 tones at ₹ 10.20 per tone
3	Issued	25 tones

(Stock verification reveals loss of 1 tones)

4	Received back from orders (Previously issued at ₹ 9.15 per tones)	10 tones
5	Issued	40 tones
6	Received	22 tones at ₹ 10.30 tones
7	Issued	38 tones

Prepare Store Ledger Account under LIFO and FIFO methods.

12. The following is a history of the receipts and issued of material in a factory during June 2008:

1.6.2008	Opening Balance	500 tones at ₹ 25
3.6.2008	Issued	70 tones
4.6.2008	Issued	100 tones
8.6.2008	Issued	80 tones
13.6.2008	Received from vendor	200 tones at ₹ 24.50
14.6.2008	Refund of surplus from a work order	15 tones at ₹ 24
16.6.2008	Issued	180 tones
20.6.2008	Received from vendor	240 tones at ₹ 24.375
24.6.2008	Issued	300 tones
25.6.2008	Received from vendor	320 tones at ₹ 24.315
26.6.2008	Issued	112 tones
27.6.2008	Refund of surplus from a work order	12 tones
28.6.2008	Received from vendor	100 tones at ₹ 25

Issues are to be priced on the principle of FIFO method. The stock verification of the factory noted on 15th, a shortage of 5 tones and on 27th another shortage of 8 tones. Write the complete Stores Ledger Account in respect of the above materials.

13. Enter the following transaction in the store ledger of Y material using FIFO method during April 2008:

1	Balance 400 units at ₹ 1 per unit
2	Issued 100 units
4	Received 1600 units at ₹ 1.10 per unit
6	Issued 600 units
10	Returned to stores 40 units issued on 2nd April
11	Received 600 units at ₹ 1.20 per unit
14	Issued 640 units
16	Received 200 unit at ₹ 1.20 per unit
20	Issued 240 units
22	Returned to vendors 80 units received on 16th April
25	Received 400 units at ₹ 1.25 per unit as GR No. 32
27	Freight ₹ 50 paid on purchase Vide GR No. 32
30	Issued 500 units.

14. The following is the record of receipts and issue of a certain material in the industries during a week in August 2008:

- 1 Opening Balance 50 tones at ₹ 10 per tone
- 1 Issued 30 tones
- 2 Received 60 tones at ₹ 10.20 per tone
- 3 Issued 25 tones
- 4 Received back from order 10 tones (previously issued at ₹ 9.15 per tone)
- 5 Issued 40 tones
- 6 Received 2 tones at ₹ 10.30 per tone

Show the store ledger account by adopting the FIFO and LIFO methods.

15. On 1st March 2008, opening balance was 300 units at ₹ 20 per unit.

- 3 Issued 150 units
- 4 Issued 100 units
- 10 Received from supplier 200 units at ₹ 19 per unit
- 16 Issued 65 units
- 20 Received from supplier 240 units at ₹ 22 per unit
- 24 Returned to supplier 20 units out of purchase of March 20th
- 25 Purchased 100 units at ₹ 24 per unit
- 26 Issued 180 units

On March 14th, received back 15 units from the production department. Stock verification on 18th March showed a shortage of 10 units. Write the Store Ledger Account under FIFO method.

16. From the following, prepare stores ledger account using LIFO method:

- |           |  |
|-----------|--|
| October 1 | Opening stock 50 kg at ₹ 10.20 per kg                                |
| October 1 | Issued 30 kg   |
| October 2 | Received 60 kg at ₹ 10.30 per kg                                     |
| October 3 | Issued 25 kg (stock verification reveals loss of 1 kg)               |
| October 4 | Received back from orders 10 kg (previously issued at ₹ 9.15 per kg) |
| October 5 | Issued 40 kg   |
| October 6 | Received 22 kg at ₹ 10.40 per kg                                     |
| October 7 | Issued 38 kg   |

17. The following are details of receipts and issue of materials in a factory during May 2008:

- |        |   |
|--------|---|
| May 1  | Opening balance 500 kg at ₹ 30                    |
| May 3  | Issue 70 kg                                       |
| May 4  | Issue 100 kg                                      |
| May 8  | Issue 80 kg                                       |
| May 13 | Received from vendor 200 kg at ₹ 28               |
| May 14 | Refund of surplus from a work order 15 kg at ₹ 25 |

May 16	Issue 180 kg
May 20	Received from vendor 240 kg at ₹ 26
May 24	Issue 304 kg
May 25	Received from vendor 320 kg at ₹ 25
May 26	Issue 112 kg
May 27	Refund of surplus from a work order 12 kg (issued on 16th May)
May 28	Received from vendor 100 kg at ₹ 24

Issues are to be priced on the principle of LIFO. The store verifier of the factory noted that on the 15th, he had found a shortage of 10 kg and on 27th another shortage of 8 kg. Write out the complete Stores Ledger Account for May 2008.

# 4

## Chapter

# Menu Costing/Pricing

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of menu costing
- Points to be noted while fixing a menu price
- Methods of menu pricing
- Meaning of banquet costing
- Steps in the calculation of charge per cover for a banquet
- Methods of banquet pricing

### MEANING OF MENU COSTING

Menu cost is a cost incurred by a company as a result of change in the prices of the products or services it sells. Menu costing or pricing is an important exercise which requires a lot of attention of the management. Menus are compiled from the recipe manuals which require skills, comprehensive knowledge of cost factors. The pricing of menu depends upon the type of menu offered by the restaurant.

#### **Factors to be Considered while Fixing a Menu Price**

Points to be noted while fixing a menu price are discussed below.

#### **Standardize and Cost the Recipes**

Every recipe for every menu item, both à la carte and catered, must be standardized and costed correctly. This basic discipline ensures consistency of product and ongoing profitability.

## **Pricing Based on Known Cost Structure**

The standard method of pricing is to take the cost of each menu item and multiply it by an appropriate multiplier to cover the cost of labour, fixed and variable costs. For instance, if you multiply the cost of the ingredients by 2.5, you will yield a 40% food cost, with a 60% profit; 3 times, will yield a 33% food cost and 66% profit. This simple formula is all well and good, but if your revenues are below projections and/or your payroll cost or overhead are higher than expected, you may still lose money.

## **Portion Control**

Standardized recipes are costed based upon specific portion sizes. Costly meat and fish products should be weighed to ensure correct portion size. Ladles of specific sizes should be used to plate menu items. Pies, cakes, and other baked desserts should be cut and served using templates to ensure the correct number of portions are realized from a multi-portion.

## **Labour Control**

Labour, both front-of-house and in the kitchen, is the single largest expense in a food service operation; it is also a continuing challenge to control. Electronic timekeeping systems make it easier for supervisors to verify employee hours, but regardless of the system used, supervisors must monitor payroll hours daily.

## **Benchmarking Revenue and Expenses**

Benchmarking is the act of measuring and analysing operating performance. In a food service operation, there are many things to benchmark, such as meals served and average spend per meal period by day of week; payroll hours by position or by meal period or day; and beer, wine, liquor sold per meal period and day of week. When tracked over time, these statistics become the baseline to project and monitor future performance. Benchmarks also allow measurement of customer reaction to food service initiatives such as new menus or pricing. Most importantly, benchmarking makes supervisors more knowledgeable about their operations. Such knowledge translates to improved operations and bottom lines.

## **Routine and Consistent Inventories**

Inventories are critical to monitor stock levels, avoid shortages, control pilferage, and determine the cost of goods sold. Keys to accurate inventories include well-organized storage areas, knowledgeable individuals conducting inventories, routine and timely inventories, and organized receiving documents, invoices, and credits slips. Delegating counts is acceptable if employees are trained. However, having the same employee conduct all inventories without spot-checking and oversight will invite problems.

## **Suggestive Selling Training for Employees**

Service employees who are trained in the techniques of suggestive selling can improve average sale value. Whenever a new menu is put in place, all servers should be provided a “selling sheet” that gives key information about each entree. Such information should include cooking

method, ingredients, time of preparation, and enticing descriptions to help sell each item. Just as standardized recipes are important in the kitchen for consistency of product, selling sheets provide the service staff with the knowledge and information they need to sell the product. In addition to entrees, special training should be given for the suggestive selling of appetisers, desserts, wines, and specialty alcoholic beverages.

### **Continual Feedback to Employees**

Every month's budgeted food sales are made up of how many meals are sold and how much each guest spends, on an average, for a meal. By breaking the projections down into meals and average spend per head and posting the daily targets prominently in the kitchen, servers are provided with goals that connect their daily efforts to the profitability. By comparing month-to-date actual meal counts and average spend per head to projected, the employees are given a day by day record of their progress.

### **Forecasting and Scheduling**

By tracking key benchmark statistics and keeping a daily log of business levels and staffing, food service supervisors can develop a routine system of forecasting business levels. While some level of volatility can always be expected in guest patronage, the act of forecasting, when formally done and evaluated after the fact, will assist in maintaining service levels while controlling labour cost.

### **Guest Feedback**

While some guests are vocal with their opinions, many are not. Food service supervisors should make it easy for guests to provide feedback. Comment cards must be readily available, periodic surveys should be conducted, revenue benchmarks should be analysed to measure guest responses to offerings and initiatives, and employees should be trained to routinely report comments made or overheard to supervisors.

## **METHODS OF MENU PRICING**

There are different methods of menu pricing prevalent in food service operations:

### **Non-Structured Method**

Under this method, one adopts the menu and prices of other similar establishments and follows the same menu and price according to the operational conditions.

### **Factor Method**

Under this method, menu price is fixed by multiplying the raw food cost by an established pricing factor. An established price factor is the value obtained by dividing the food cost percentage with 100. For example, if the food cost is 40%, then divide this by 100 and come up with 2.5 as a factor.

$$\text{Menu price} = \text{Raw Food Cost} \times \text{Pricing Factor}$$

$$\text{Selling price} = \frac{\text{Actual Cost} \times 100}{\text{Food Cost Percentage}}$$

### Prime Cost Method

Under this method, a food item is determined from a standardized recipe used. The prime cost includes direct labour (i.e. 1/3rd of total labour cost) along with raw food cost. Multiply the prime cost by the factor to get the menu price. To establish this factor, deduct the amount of direct labour from the total labour cost. If food cost is 40%, let us assume a 30% labour cost, of which 1/3rd is direct labour cost, i.e. 10% for direct labour cost. From a possible 60% margin, subtract 10% for direct labour cost, and then there will be a margin of 50%. 50% margin divided by 100 gives a factor of 2.0. Thus, menu price = Prime cost  $\times$  Factor, i.e. Actual cost (300) + Direct labour cost (75)  $\times$  Factor (2.0) =  $375 \times 2 = 750$ .

### Actual Cost Method

Under this system, a raw food cost is established and to this is added labour cost, other variable cost, fixed cost; profit (certain % of sales from the P/L A/c). The total of these is taken as the menu price.

### Gross Profit Method

Under this method, the past gross profit based on financial statements is divided by the number of customers and an average gross profit is established. Along with this average gross profit, extra menu items' price like bar, snacks, coffee, etc. is added.

### Base Price Method

Under this method, a base menu price is fixed and then worked backward to the profit. We assume a certain percentage of profit, labour cost, overhead cost. Suppose the base price of a product developed from a customer bill is ₹ 100. The profit and loss statement or pro-forma budget will establish average percentages of the desired profit, labour and overhead. Assuming 15% profit, 22% labour, 23% overhead cost, the total of these three comes to ₹ 60 (when calculated on ₹ 100). Thus, the amount to be spent on raw material = ₹ 100 – 60 = ₹ 40.

### Forced Food Cost/Final Pricing Method

There are eight steps in the calculation of cost under this method:

- (a) Determine the operating (overhead) cost per hundred rupees.
- (b) Budget the labour cost.
- (c) Determine the desired profit (mark-up) percentage per rupees hundred of business.
- (d) Add operating cost, labour and desired profit percentage to arrive at the cost without food cost percentage.
- (e) Subtract the cost without food from 100 points.
- (f) Determine the raw food cost from standardized recipe and add the raw cost of extra trimmings.
- (g) Divide the answer of the step six by the raw food cost to find the value of each food point.
- (h) Multiply the 100 points by the value of each food point and one will get menu price.



**Example**

The following details relating to Chicken Fried Steak are extracted from the standardized recipe of the XYZ Restaurant:

Ingredients:	₹
Cube Steak (Meat)	50
Flour	7
Egg	12
Bread Crumbs	6
<b>Total</b>	<b>75</b>

Additional information:	Percentage
Operating (Overhead) Cost	27%
Labour Cost	26%
Desired profit (Mark-up)	15%
<b>Total cost without Food</b>	<b>68%</b>

**Solution:**

Value of Rupee in paise	100
Total Cost without Food	-68
<b>True Raw Food cost</b>	<b>32</b>

$$\begin{aligned}\text{Menu Price} &= 75/32 = 2.3 \\ &= 2.3 \times 100 = ₹ 230\end{aligned}$$

**Pricing of a La Carte Menu**

The term *a la carte* menu refers to those types of meals in which rolls and butter rolls are included in the price of the entree, but all the food items are charged separately. The method of pricing the *a la carte* menu is as follows:

- Decide the overall gross profit percentage on the *a la carte* sales as per the hotel's pricing policy.
- Decide about the percentage of gross profit required on each selection of *a la carte* sales-mix.
- Based on closed recipe, decide the selling price of each item by adding the pre-determined percentage of gross profit to the cost per-portion.
- Decide the duration of the menu period and predict the price to be obtained. Fix the menu price by reference to the predicted food costs.

The cost of one portion of dish is calculated from the unit card and the maximum menu price at a given gross profit is noted. After taking into account price fluctuations due to market trends and seasonal variations and the customer's ASP of the establishment, fix the selling price for each dish.

## Pricing of Table d'Hôte

With the help of dish costing, a multiple cost sheet is prepared and food cost for the menu is ascertained, but the total cost of one portion of each course is used as a basis for calculating the price of table d'hôte menu breakfast, lunch or dinner. One should plan the menu in such a manner that the selection of dishes included in each course is the same average basic food cost with marginal percentage to increase the required gross profit margin achieved by the food and beverage unit.

## En Pension Term

The total daily charge for food is apportioned between meals to be provided and a target food cost for each meal is established. Thus, there is a food cost target for every meal included in en pension terms. The executive chef prepares suitable menus and organizes the production of food in such a way as to ensure that the targets are adhered to.

The usual method of costing menu of food and beverage operation is as follows:

In order to fix a selling price for a menu, we have to first calculate the ingredient cost of each item of the menu taking the price from the invoices and then add a certain percentage to cover the labour cost, overhead and net profit.

**Differential Gross Profit Percentage:** It is not correct to add the same overall percentage to all the dishes, as some dishes may have very high food cost and some others low food cost. Items like meat and fish dishes have high food cost percentage i.e., lower kitchen percentage, while soups, sweets, teas may have a lower food cost percentage i.e., higher kitchen percentage. The selling price of each of the dishes can be calculated by the following formula:

$$\text{Selling price per portion} = \frac{\text{Cost per portion} \times 100}{\text{Food Cost \%}}$$

## Other Menu Pricing Methods

While fixing the menu price, one has to take the portion into account depending upon the ingredients that are purchased in weight, count and volume. Calculate the cost of all ingredients used in the production of a specific menu item (the actual item, seasonings, garnishes). Total these costs and divide by a food cost to be achieved for that menu item. This determines a menu price.

For example, a cheese burger with tomato, lettuce, and mustard on a wheat bun with a bag of chips has a total cost of all ingredients – ₹ 100. To achieve a 30 percent food cost for this burger, divide 100 by 30% (.30), which would give a menu price of ₹ 333.33.

It is better to keep the food costs between 22 and 34%. If the food cost is 34%, that means one spends 34 paise for every rupee for food. The balance 66% will cover the labour costs and other expenses.

**Factoring Method:** Multiply the cost of ingredients by three (this method does not include labour or other costs).

**Gross Margin Pricing:** The formula is, gross profit minus cost of goods sold divided by net sales. A gross profit margin of 0.33:1 means that for every rupee in sales, you have 33 paise to cover your basic operating costs and profit. This is a good method for dishes having a high cost of ingredients.

**Prime Cost Method:** The formula is to add the cost of labour and cost of food, add a percentage for profit. This method is good for dishes that require a lot of preparation.

**Competitive Pricing:** Competitive pricing seeks to match what others charge for the same product or service. Conduct a market study and compare the prices to similar ones on the menu. That means pricing the product neither very far above nor below what others charge.

**Combination Pricing:** This method considers all methods—factoring, gross margin, prime costs and competition, and tries to balance the prices of the competition with the costs and needs.

## BANQUET COSTING

Banqueting may be defined as a special request party arranged for some specific number of persons on a particular date. These special functions are banquets, wedding parties, receptions, conferences, conventions, etc. The special functions in a hotel are part and parcel of food and beverage sales, which is an additional source of revenue.

The method of calculation of cost of food for a banquet is the same as is used in dish costing. Other elements such as additional labour, other direct expenses such as cost of menu, floral decorations, band hire, etc. can be estimated based on experience. General overhead and net profit are calculated on the basis of percentage of sales.

The steps followed to calculate charge per cover for a banquet are:

1. Costing of standard menus and range of prices on multiple costing sheets for every type of functions.
2. Select menus offered to the client and calculate the cost of each dish obtained from the unit cost card.
3. Calculate the total cost of one cover and multiply it by the number of guests to be catered for.
4. Special functions require extra labour for a large number of guests and concentration of service for over a start period. Include the wages of additional labour in the cost.
5. Add a certain percentage of the charge in the cost to cover the cost of overheads.
6. On the basis of management's pricing policy, add net profit percentage to get the selling price per cover.

## BANQUET MENU PRICING

Hotels or facilities usually will not guarantee group menu prices more than six to eight months in advance. The seasonal availability and constant fluctuation of food costs prevent pricing guarantees from being feasible beyond that time frame. Therefore, when planning for future events, experts suggest building a 10–15 percent cushion into their food budgets. If contacted in advance, the executive chef often is willing to customize a menu that may actually be lower in cost than those listed on the standard banquet menus. All agreements on menus, prices, and terms should *always* be in writing. Banquets can yield a profit margin of 30–40 percent, as opposed to hotel restaurants, which have higher labour costs and typically much lower profit.

Therefore, banquets are largely responsible for the food and beverage departmental income, which is the second largest source of income for a hotel.

### **Methods of Banquet Pricing**

Three general types of pricing methods used by caterers are:

1. Thirds method
2. Contribution margin (CM) method
3. Multiplier method

#### ***Thirds Method***

- Calculate a per-person price that will cover three things equally:
  1. Cost of food, beverage, and other supplies (such as napery, dance floor, etc.)
  2. Cost of payroll to handle the function, plus overhead expenses needed to open the room (such as turning on the air conditioning units, etc.)
  3. Profit.
- With a ₹ 300.00 price per-person, the caterer will have approximately ₹ 200.00 to cover expenses, leaving a ₹ 100.00 profit from each guest.
- The caterer will also add taxes and gratuities (or service charges) to this price.

#### ***Contribution Margin (CM) Method***

- This is the typical pricing method used by large caterers.
- Everything must make a profit.
- It is too difficult for large caterers to build each party from scratch, so it is necessary to standardize some things.
- The caterer must know as much as possible all the expenses associated with “opening the room,” apart from the types of menu items meeting planners will order.
- These are essentially fixed catering expenses, such as salaries and wages, utilities, paper products, and marketing.
- These total fixed expenses must be divided by the number of attendees expected for a year.
- This gives the caterer a reasonable estimate of the amount of fixed expense per attendee.
- To this number is added the per-person cost for the food, beverage, and other variable costs (such as special linen) that come with a particular catering menu option.
- Once the caterer knows how much the total variable and fixed expense is per person, the desired profit margin is then added to each menu option.

#### ***Multiplier Method***

- This is a version of the contribution margin (CM) method.
- Once it is established, the caterer then multiplies it by a factor that usually varies from about 3 to 7, but can go higher.
- The factor is related to the type of services, ambience, and so forth, provided to attendees.
- The more expensive, the higher the factor will be.

- The factor can be independent of the variables such as type of services ambience, etc., during the high season; even modest caterers can command a high price.
- The factors and price are influenced by competition and what the market will bear.
- It will be as high as possible.
- To the caterer, there is no such thing as a price that is too high.

## ILLUSTRATIONS

### Menu Costing

1. A restaurant presently offers the following four items on its menu, with item cost, selling prices, and average daily sales as indicated:

Item	Cost	Selling Price	Average Daily Sales
1	22.50	52.00	55
2	17.00	48.00	60
3	15.50	35.50	125
4	25.50	60.00	70

The restaurant is considering replacing the present menu with a new one. Information about the new one is as follows:

Item	Cost	Selling Price	Average Daily Sales
1	18.00	53.00	50
2	20.50	54.50	65
3	19.00	37.50	130
4	23.00	50.00	65

From each of the menus, calculate the cost percent, the total gross profit, and the gross profit per guest. Which menu would be preferable? Why?

### ***Solution:***

Menu A						
<i>Item</i>	<i>Cost</i>	<i>Selling Price</i>	<i>Avg. Daily Sales</i>	<i>Cost %</i>	<i>Gross Profit</i>	<i>GP/Guest</i>
1	22.5	52	55	43.2692	29.5	0.536363636
2	17	48	60	35.4167	31	0.516666667
3	15.5	35.5	125	43.662	20	0.16
4	25.5	60	70	42.5	34.5	0.492857143
<b>Total</b>	80.5	195.5	<b>310</b>	<b>41.1765</b>	<b>115</b>	<b>0.370967742</b>

*Contd.*

## Menu B

<i>Item</i>	<i>Cost</i>	<i>Selling Price</i>	<i>Avg. Daily Sales</i>	<i>Cost %</i>	<i>Gross Profit</i>	<i>GP/Guest</i>
1	18	53	50	33.9623	35	0.7
2	20.5	54.5	65	37.6147	34	0.523076923
3	19	37.5	130	50.6667	18.5	0.142307692
4	23	50	65	46	27	0.415384615
<b>Total</b>	<b>80.5</b>	<b>195</b>	<b>310</b>	<b>41.2821</b>	<b>114.5</b>	<b>0.369354839</b>

Menu A is most preferred as the gross profit per guest is more as compared to menu B.

2. What is the selling price if the actual cost of food is ₹ 300, which is 40% using factor method?

Under factor methods, if the food cost is 40%, 60% of the income is to cover all expenses beyond food.

**Solution:**

$$\begin{aligned}
 \text{Selling Price} &= \frac{\text{Food Cost} \times 100}{40} \\
 &= \frac{300 \times 100}{40} \\
 &= \frac{3000}{4} = ₹ 750
 \end{aligned}$$

3. What is the selling price using prime cost method if the raw food cost is ₹ 300, and the direct labour cost is ₹ 75 (referral from the financial statement)? Assume that the food cost is 40%, the total labour cost is 30% and 1/3rd of the labour cost is direct labour, and the working margin is 60%.

**Solution:**

$$\begin{aligned}
 \text{Prime Cost} &= \text{Raw Food Cost} + \text{Direct Labour Cost} \\
 &= 300 + 75 = ₹ 375
 \end{aligned}$$

$$\begin{aligned}
 \text{Factor} &= \text{Working Margin} - 10\% \text{ (i.e. 1/3rd of labour cost)} \\
 &= 60 - 10 = 50\%
 \end{aligned}$$

$$50\% \text{ margin divided into } 100 = 2.0 \text{ (Factor)}$$

$$\text{Selling Price (Menu Price)} = \text{Prime Cost} \times \text{Factor}$$

$$= 375 \times 2.0 = ₹ 750$$

4. From the following information, calculate the menu price and compare it with the selling price based on 40% food cost to determine what the difference would be in the menu prices:

Entrée items	Cost	Cost of Extra Menu Items	G.P% (from P. Year)
Half chicken	100	20	30
Steak	200	20	60
Lobster	300	20	90

**Solution:**

Calculation of Menu Price and Selling Price			
	Half Chicken	Steak	Lobster
Cost	100	200	300
Cost of Extra item	20	20	20
Gross profit	30	60	90
<b>Menu Price</b>	150	280	410
<b>#Selling Price (Based on 40% Food cost/mark-up)</b>	<b>300</b>	<b>550</b>	<b>800</b>

$$\text{Selling Price} = \frac{\text{Food Cost} \times 100}{40}$$

$$\text{Half Chicken} = \frac{120}{40} \times 100 = ₹ 300$$

$$\text{Steak} = \frac{220}{40} \times 100 = ₹ 550$$

$$\text{Lobster} = \frac{320}{40} \times 100 = ₹ 800$$

5. The base price of a product is ₹ 100 (from a customer check distribution graph). Assume a 15% profit, 23% overhead, and 22% labour (budgeted or previous P/L statement). What should be the cost of the product below which it cannot be sold?

**Solution:**

	₹
Labour Cost 22% of ₹ 100	= 22
Overhead Cost 23% of ₹ 100	= 23
Profit 15% of ₹ 100	= 15
<b>Total</b>	<b>= 60</b>

Amount to be spent on Raw Material = ₹ 100 – 60 = ₹ 40

Any recipe with a cost less than ₹ 40 can be served.

### Banquet Costing

6. A hotel arranged a special function for 100 covers. The food cost will be ₹ 225 per head. Wages for extra staff will be ₹ 2500. The management expects 20% of the sales to cover overhead, and require a net profit of 10%. Prepare a statement indicating:

- (i) The charge per cover to the customer
- (ii) The labour cost as a percentage of sales
- (iii) The food cost as a percentage of sales
- (iv) The amount of money contributed to overheads
- (v) What amount of money the net profit percentage represents?

**Solution:**

	₹	%
Food Cost	22,500	(63.00)
Additional Labour	2500	(07.00)
Overheads	7142.80	(20.00)
Net Profit	3571.40	(10.00)
<b>Total</b>	<b>35,714</b>	<b>(100.00)</b>

- Charge per cover = Selling Price/No. of Covers  
 $= 35,714/100 = ₹ 357.14 \text{ per cover}$

**Working Notes:**

$$\begin{aligned} \text{Selling Price} - (\text{Overheads} + \text{Net Profit}) &= 25,000 \\ 100\% - (20\% + 10\%) &= 70\% \end{aligned}$$

$$\text{Therefore, Selling Price} = 25,000/70\% = ₹ 35,714$$

- Overheads =  $35,714 \times 20\% = ₹ 7142.80$
  - Net Profit =  $35,714 \times 10\% = ₹ 3571.40$
7. A hotel arranged a state banquet for 500 persons. It was estimated that the total food cost will be ₹ 27,380, additional cost of staff will be ₹ 18,245, and overhead could be allowed for at 22.5% of sales. What charge per cover should be made in order to produce a net profit of 12.5%?

**Solution:**

	₹	%
Food Cost	27,380	(39.00)
Additional Labour	18,245	(26.00)
Overheads	15,793	(22.50)
Net Profit	8774	(12.50)
<b>Total</b>	<b>70,192</b>	<b>(100.00)</b>

- Charge per cover = Selling Price/No. of Covers  
 $= 70,192/500 = ₹ 140.384 \text{ per cover}$



**Working Notes:**

$$\text{Selling Price} - (\text{Overheads} + \text{Net Profit}) = 45,625$$

$$100\% - (22.50\% + 12.50\%) = 65\%$$

$$\text{Therefore, Selling Price} = 45,625/65\% = ₹ 70,192$$

$$\bullet \text{ Overheads} = 70,192 \times 22.50\% = ₹ 15793.20$$

$$\bullet \text{ Net Profit} = 70,192 \times 12.50\% = ₹ 8774$$

8. Calculate: (i) the charge to the customer per cover and (ii) the rate of gross profit which will be made from the information given below:

Function	Banquet
No. of Covers	200
Butcher	5490
Fish manger	5224
Green Grocer	2108
Grocer	2836
Dairy	346
Wages of extra staff	7600
Overheads	4400

It is desired to make a net profit of 12.5% on sales.

**Solution:**

	₹	₹
<b>Food Cost</b>		
Butcher	5490	
Fish manger	5224	
Green Grocer	2108	
Grocer	2836	
Dairy	<u>346</u>	<b>16,004</b>
<b>Labour Cost</b>		
Wages of extra staff		7600
<b>Overheads</b>		<u>4400</u>
<b>Total Cost</b>		<b>28,004</b>
<b>Net Profit (12.50%)</b>		<b>4000</b>
<b>Selling Price</b>		<b><u>32,004</u></b>

- **Charge Per Cover** = Selling Price/No. of Covers  
 $= 32,004/200 = ₹ 160.02 \text{ per cover}$

- **Gross profit percentage** =  $\text{Gross Profit} / \text{Selling Price} \times 100$   
 $\text{Gross Profit} = \text{Selling Price} - \text{Food Cost}$   
 $= 32,004 - 16,004 = ₹ 16,000$   
 $= 16,000 / 32,004 \times 100 = 49.99\%$

**Working Notes:**

$$\begin{aligned}\text{Selling Price} - \text{Net Profit} &= 28,004 \\ 100\% - 12.50\% &= 87.50\%\end{aligned}$$

$$\text{Therefore, Selling Price} = 28,004 / 87.50\% = ₹ 32,004$$

9. A hotel arranged wedding reception for 500 covers. The expenses were as follows:

	₹
Wages and Labour charges	22,175
Butcher	11,590
Green Grocer	2975
Dairy	1120
Fish manager	8205
Stores Issues	11,550
Overheads	16,750

You are required to find out the following:

- Calculate what charge per cover should be made in order to achieve a net profit of 15%.
- What rate of gross profit will be made?
- Express the wages and overheads as a percentage of sales.

**Solution:**

	₹	₹
<b>Food Cost</b>		
Butcher	11,590	
Green Grocer	2975	
Dairy	1120	
Fish manager	8205	
Stores Issues	11,550	35,440
<b>Labour Cost</b>		
Wages and Labour Charges		22,175
<b>Overheads</b>		16,750
<b>Total Cost</b>		<b>74,365</b>
<b>Net Profit (15%)</b>		<b>4000</b>
<b>Selling Price</b>		<b>32,004</b>

- **Charge Per Cover** = Selling Price/No. of Covers  
 $= 32,004/200 = ₹ 160.02 \text{ per cover}$
- **Gross profit percentage** = Gross Profit/Selling Price  $\times 100$   
 Gross Profit = Selling Price – Food Cost  
 $= 32,004 - 16,004 = ₹ 16,000$   
 $= 16,000/32,004 \times 100 = 49.99\%$

**Working Notes:**

$$\text{Selling Price} - \text{Net Profit} = 28,004$$

$$100\% - 12.50\% = 87.50\%$$

$$\text{Therefore, Selling Price} = 28,004/87.50\% = ₹ 32,004$$

10. The Blue Star Hotel arranged a banquet for 250 covers. The following information is given:

	₹
Food Cost	17,338
Labour Cost	11,813
Overhead	18% of sales
Desired Net Profit	10%

Find the charge per cover which will be necessary for the hotel to recover.

**Solution:**

	₹	%
Food Cost	17,338	(42.82)
Additional Labour	11,813	(29.18)
Overheads	7287.75	(18.00)
Net Profit	4048.75	(10.00)
<b>Total</b>	<b><u>40,487.50</u></b>	<b><u>(100.00)</u></b>

- Charge per cover = Selling Price/No. of Covers  
 $= 40,487.50/250 = ₹ 161.95 \text{ per cover}$

**Working Notes:**

$$\text{Selling Price} - (\text{Overheads} + \text{Net Profit}) = 29,151$$

$$100\% - (18\% + 10\%) = 72\%$$

$$\text{Therefore, Selling Price} = 29,151/72\% = ₹ 40,487.50$$

- Overheads =  $40,487.50 \times 18\% = ₹ 7287.75$
- Net Profit =  $40,487.50 \times 10\% = ₹ 4048.75$

11. Mr. View Restaurant has to arrange a dinner for 600 covers. A specially constructed menu has been costed, the details of which are given below:

	₹
Food Cost	34,500
Additional Labour	10,500
Floral Decorations	2250
Printing of Special Menu and Place cards	2500
Toast Master and Orchestra	8000

The management wishes to allocate 17.5% of sales for overheads and achieve a net profit of 12.5%.

Find out: (a) Overhead cost, (b) Net profit, (c) Percentage of each element with the sale, and (d) Charge per cover.

**Solution:**

	₹	%
Food Cost	34,500	(41.82)
Additional Labour	10,500	(12.72)
Floral Decorations	2250	(02.73)
Printing of Special Menu and Place cards	2500	(03.03)
Toast Master and Orchestra	8000	(09.70)
<b>Total</b>	<b>57,750</b>	<b>(70.00)</b>

Selling Price – (Overheads + Net Profit) = 57,750

$100\% - (17.5\% + 12.5\%) = 70\%$

Therefore, Selling Price =  $57,750 / 70\% = ₹ 82,500$

- (a) Overheads =  $82,500 / 17.5\% = ₹ 14,437.50$   
 (b) Net Profit =  $82,500 / 12.5\% = ₹ 10,312.50$   
 (c) Charge per cover = Selling Price/No. of Covers  
 $= 82,500 / 600 = ₹ 137.50$  per cover

12. The Steel Authority of India approached the Deluxe Catering Services for a special function for 1000 covers to be arranged on 31st Dec. 2011. The food cost calculated from the special menu was ₹ 100 per cover. The additional labour cost will be ₹ 40,000. If the policy of the management is that overhead should be provided for on the basis of 20% of sales and a net profit of 12% should be achieved, calculate:

- Food Cost Percentage
- Labour Cost Percentage
- Overhead Cost
- Net Profit
- Charge per Cover

**Solution:**

	₹	%
Food Cost	10,0000	(50.00)
Additional Labour	40,000	(20.00)
Overheads	40,000	(20.00)
Net Profit	24,000	(12.00)
<b>Total</b>	<b>57,750</b>	<b>(70.00)</b>

Selling Price – (Overheads + Net Profit) = 1,40,000

$$100\% - (20\% + 12\%) = 68\%$$

Therefore, Selling Price =  $1,40,000 / 68\% = ₹ 2,00,000$

(c) Overheads =  $2,00,000 / 20\% = ₹ 40,000$

(d) Net Profit =  $2,00,000 / 12\% = ₹ 24,000$

(e) Charge per Cover = Selling Price / No. of Covers  
 $= 2,00,000 / 1000 = ₹ 200 \text{ per cover}$

13. The turnover of TSO Morarai Restaurant for the month of September was ₹ 2,10,000 working on 60% gross profit margin. At this, the restaurant has not been functioning to its full capacity. The manager of the restaurant felt that a gross profit of 55% would still be sufficient to cover the costs although the net profit percentage would be lower. By lowering the selling price, the restaurant would possibly attract some customers and it is estimated that the turnover would be increased by ₹ 51,250 p.m. You are required to find the difference in gross profit in each of the following cases:

(i) When the gross profit is 55%.

(ii) When the gross profit is 60%.

**Solution:**

1. Selling Price =  $2,10,000 + 51,250 = ₹ 2,61,250$

$$\text{Gross Profit Margin} = 55\% = 2,61,250 \times 55\% = ₹ 1,43,687.50$$

2. Selling Price = ₹ 2,10,000

$$\text{Gross Profit Margin} = 60\% = 2,10,000 \times 60\% = ₹ 1,26,000$$

14. A special menu is prepared for a banquet party. You are required to calculate the charge per cover on the basis of information given below:

Name of the restaurant	The Kanyakumari View
No. of Covers	500
Stores	₹ 3850
Fish manager	₹ 6270

Butcher	₹ 6930
Dairy	₹ 880
Green Grocer	₹ 3520

**Labour Cost**

Salaries and Wages	₹ 3850
Part-time workers	₹ 10,230

**Overheads**

Establishment Charges	₹ 8580
Linen, Floral Decoration	₹ 6050

The restaurant intends to achieve a net profit of 15%.

**Solution:**

<b>No. of Covers</b>	<b>500</b>	
<b>Food Cost</b>	₹	₹
Stores	3850	
Fish manager	6270	
Butcher	6930	
Dairy	880	
Green Grocer	<u>3520</u>	<u>21,450</u>
<b>Labour Cost</b>		
Salaries and Wages	3850	
Part-time workers	<u>10,230</u>	<u>14,080</u>
<b>Overheads</b>		
Establishment Charges	8580	
Linen, Floral Decoration	<u>6050</u>	<u>14,630</u>
Total Cost (85%)		50,160
Net Profit (15%)		8852
<b>Selling Price (100%)</b>		<u><b>59,012</b></u>

$$\begin{aligned}\text{Charge per Cover} &= \text{Selling Price/No. of Covers} = 59,012/500 \\ &= \text{₹ } 118.024\end{aligned}$$

15. The Bursar in charge of a MSRCHM's hall of residence hoped to cover all the expenses during the year of 52 weeks. The normal year was of 30 weeks of duration for MSRCHM. Income from students amounted to ₹ 400 per week during term time. Expenses were as follows:

- Food and beverage ₹ 220 per week during term time.
- Labour cost ₹ 100 per week for the full 52 weeks
- Overhead cost ₹ 50 per week for the full 52 weeks

There was a chance of three conferences of equal length being held at the hall during vacation accommodating 30, 45, and 40 delegates, respectively. The cost of beverage for these conferences would be ₹ 20 per head.

- Calculate the quotation per portion that the Bursar should give to the conference organizers in order to cover all the expenses for the year.
- The conference organizer replies that he will take only the hall at ₹ 70 per person. Should the Bursar accept this offer if there is no possibility of other booking (give figures to support your answer)?

**Solution:**

	₹
Food Cost	220
Labour Cost	100
Overheads	50
Cost of Beverages	20
<b>Total Cost</b>	<b><u>390</u></b>

Charge for 52 – 30 = 22 weeks =  $390 \times 22 = 8580$

Charge per person  $8580/115 = ₹ 74.60$

The order @ ₹ 70 per person can be accepted only if there is no possibility of other booking.

16. The banqueting manager of a hotel has received separate requests from Surgeon's Association and Accountant's Association for a party for the same evening. Unfortunately, the hotel has got only one function room available and has to choose the best one.

The following information is available:

The banqueting manager has 9 permanent employees who are entitled to ₹ 200 for each evening's work. Casual labour is also available at the rate of ₹ 10 per hour. Corporate policy is to add ₹ 80 per cover as overhead charges.

Banquet request information:

	Surgeon's Assn.	Accountant Assn.
Number of covers	250	350
Price agreed/cover	₹ 300	₹ 275
Casual labour needed	5 for 3 hours	7 for 5 hours
Food cost per cover	35%	38%

Average per head consumption of wine: 250 ml

Average cost of wine ₹ 500 per bottle of 750 ml capacity

Gross profit target on the sale of wine 60%

The company is to prepare a banquet sheet in the standard form as given before accepting the order.

**Banquet Sheet**

Price × No. of covers		xx
<i>Less:</i>		
Food cost × No. of covers	xx	
Banqueting wages (permanent)	xx	
Banqueting wages (casual)	xx	
Overhead charges × No. of covers	<u>xx</u>	<u>xx</u>
<i>Add:</i>		
Gross profit on wine sales	xx	
Profit	xx	
Gross Profit % on Food Sales	xx	

Complete the form, find out which order can be accepted and comment of the decision.

***Solution:***

<b>Banquet Sheet (Surgeons)</b>		₹
Price × No. of covers		75,000
<i>Less:</i>	₹	
Food cost × No. of covers	26,250	
Banqueting wages (permanent)	1800	
Banqueting wages (casual)	150	
Overhead charges × No. of covers	<u>20,000</u>	<u>48,200</u>
		26,800
<i>Add:</i>		
Gross profit on wine sales		25,000*
Profit		<u>51,800</u>
Gross Profit % on Food Sales		65%
<b>Profit Per Person ( 51,800/250)</b>		<b>207.20</b>

**\*Gross Profit on wine sales:**

No. of covers × Average consumption	= 250 × 250 ml	= 62500 ml (62.5 liters)
No. of bottles required	= 62500 ml/750 ml	= 83.3 bottles
Cost of Wine	= 83.3 × ₹ 500 per bottle	= ₹ 41,666.67
Gross Profit	= 41,666.67 × 60%	= ₹ 25,000



**Banquet Sheet (Accountants)**

		₹
Price × No. of covers		96,250
<i>Less:</i>	₹	
Food cost × No. of covers	36,575	
Banqueting wages (permanent)	1800	
Banqueting wages (casual)	350	
Overhead charges × No. of covers	28,000	46,725
		<u>29,525</u>
<i>Add:</i>		
Gross profit on wine sales		35,000*
Profit		<u>64,525</u>
Gross Profit % on Food Sales		62%
<b>Profit Per Person (64,525/350)</b>		<b>184.36</b>

**\*Gross Profit on wine sales:**

No. of covers × Average consumption	= 350 × 250 ml	= 87500 ml (87.5 liters)
No. of bottles required	= 87500 ml/750 ml	= 116.67 bottles
Cost of Wine	= 116.67 × ₹ 500 per bottle	= ₹ 58,335
Gross Profit	= 58,335 × 60%	= ₹ 35,000

As the profit per person is more for the Surgeons party (₹ 207.20) as compared to the Accountants Party (₹ 184.36), the Surgeons party can be accepted.

**Objective Type Questions**

*Fill in the blanks:*

- In \_\_\_\_\_ method, menu price is fixed by multiplying the raw food cost by an established pricing factor.
- In \_\_\_\_\_ method cost of a food item is determined from a standardized recipe used.
- \_\_\_\_\_ refers to those types of meals in which rolls and butter rolls are included in the price of the entree, but all the food items are charged separately.
- \_\_\_\_\_ may be defined as a special request party arranged for some specific number of persons on a particular date.
- To fix a selling price for a menu we have to first calculate the \_\_\_\_\_ cost of each item of the menu taking the price from the invoices.

## Review Questions

1. What is menu cost?
2. What are the factors to be considered while fixing the menu price?
3. What are the methods of menu pricing?
4. Write a short note on:
  - (a) Pricing of *a la carte* menu
  - (b) Pricing of Table d'Hôte
5. What is banquet costing?
6. What are the steps to be followed to calculate charge per cover for a banquet?
7. What is banquet menu pricing?
8. What are the methods of banquet menu pricing?

## Exercises

1. Information given below is related to Chicken Fried Steak extracted from the standardized recipe of the Pioneer Restaurant:

<b>Ingredients:</b>	<b>₹</b>
Cube Steak (meat)	50
Flour	7
Egg	12
Bread Crumbs	6
<b>Total</b>	<b>75</b>

<b>Additional Information:</b>	<b>Percentage</b>
Operating (overhead) Cost	27%
Labour Cost	26%
Desired Profit (mark-up)	15%
<b>Total Cost without Food</b>	<b>68%</b>

Calculate the menu price using forced food cost or final pricing method.

2. From the following, calculate the selling price and overall gross profit using differential gross profit percentages method.

Course	Food Cost (₹)	G.P. %
Soups/Starters	25.00	75%
Main Courses	100.00	40%
Vegetables	30.00	60%
Sweets	20.00	80%
Teas/Coffees	25.00	85%
<b>Total</b>	<b>200.00</b>	<b>67.14%</b>

3. A banquet for 120 covers is to be prepared for which the food cost will be ₹ 1532.50 and labour cost ₹ 987.50. Overheads are to be allowed at 20% of sales.
  - (a) Calculate the charge per cover to make a net profit of 20% on sales.
  - (b) Calculate the amount of net profit which will be made.
  - (c) Calculate the gross profit per cover.
4. A banquet for 1000 covers is to be prepared for which the food cost will be ₹ 40,000 and labour cost ₹ 20,000. Overheads are to be allowed at 20% of sales.
  - (a) Calculate the selling price per cover to make a net profit of 20% on sales.
  - (b) Calculate the amount of net profit which will be made.
  - (c) Calculate the gross profit per cover.
5. A hotel has arranged a special banquet for 150 covers. The total food cost for the special menu is calculated as ₹ 20,000, additional labour cost ₹ 3000, and floral decorations, special menus and secondary extras will cost ₹ 1000. The management wishes 17% of the sales to be allocated for overheads and require to achieve a 13% net profit.

You are required to:

  - (a) Calculate the charge per cover to the customer.
  - (b) Prepare a statement to show—(i) food cost as a percentage of sales, (ii) labour cost as a percentage of sales, (iii) overheads allocation in monetary terms and (iv) the net profit in monetary terms.

# 5

## Chapter

# Break-even (or cost-volume-profit) Analysis

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of break-even analysis
- Components of cost-volume-profit (CVP) analysis
- Break-even chart
- Managerial uses of break-even analysis

### INTRODUCTION

Break-even analysis is concerned with the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed and variable costs.

Break-even analysis is a technique to study about the effect on profit on account of changing level of production due to heavy competition, introduction of new product, trade depression or boom, increased demand of the products, scarce resources, changes in the selling price of products, etc.

In a narrow sense, break-even analysis is concerned with finding out the **break-even point**, i.e., the level of activity where the total cost equals the total selling price. It is a volume of sales at which there is neither profit nor loss. The point is also known as the volume of operation where profits begin. Break-even point can be stated in the form of an equation:

$$\text{Sales at break-even point} = \text{Fixed cost} + \text{Variable cost}$$

$$\text{B.E.P.} = \text{Fixed Cost/Selling price per unit} - \text{Variable Cost per unit (Contribution per unit)}$$

In a broader sense, it means that system of analysis which determines the probable profit at any level of production. As this analysis establishes a relationship of costs, volume and profits, it is also known as **Cost-Volume-Profit Analysis**.

In order to understand the concept of break-even point, it would be better to know the Marginal Cost Equation:

$$S - V = F + P = C$$

S = Sales

V = Variable Cost

F = Fixed Cost

P = Profit

C = Contribution

$$S = V + F + P$$

$$S - V = F + P$$

$$F + P = C$$

$$S - V = C$$

$$S - V = F + P = C$$

## CONTRIBUTION

Contribution is the difference between the sales and the marginal cost of sales, and it contributes towards fixed expenses and profit.

Contribution = Selling price – Marginal Cost (Variable Cost)

Contribution = Fixed Cost + Profit

Contribution – Fixed Expenses = Profit

## Contribution/Sales or Profit/Volume (P/V) Ratio

P/V ratio or Profit Volume Ratio is a useful guide in determining the profitability of business. This ratio shows the relationship between contribution and sales and is usually expressed as a percentage.

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

or

$$\text{Fixed Cost} + \text{Profit/Sales}$$

or

$$\text{Sales} - \text{Variable Costs/Sales}$$

or

$$\text{Change in Profits or Contributions/Change in Sales}$$

The higher the P/V ratio, the more will be the profit, and the lower the P/V ratio, the lesser will be the profit.

The P/V ratio is very useful and is used for the calculation of:

(i) Break-even Point = Fixed Cost/P/V ratio

(ii) Value of Sales to earn a desired amount of profit

$$= \text{Fixed Cost} + \text{Desired Profit/P/V ratio}$$

- (iii) Variable Costs = Sales (1 – P/V ratio)
- (iv) Profit = (Sales × P/V ratio) – Fixed Cost
- (v) Fixed Cost = (Sales × P/V ratio) – Profit
- (vi) Margin of Safety = Profit/P/V ratio

## COST-VOLUME-PROFIT (CVP) ANALYSIS

CVP analysis involves the analysis of how total costs, total revenues and total profits are related to sales volume, and is therefore concerned with predicting the effects of changes in costs and sales volume on profit. It is also known as ‘break-even analysis’.

The technique, if used carefully, may be helpful in the following situations:

- (a) Budget planning. The volume of sales required to make a profit (break-even point) and the ‘safety margin’ for profits in the budget can be measured.
- (b) Pricing and sales volume decisions.
- (c) Sales mix decisions, to determine in what proportions each product should be sold.
- (d) Decisions that will affect the cost structure and production capacity of the company.

### Basic Assumptions of CVP Analysis

CVP analysis is based on the assumption of a linear total cost function (constant unit variable cost and constant fixed costs) and so is an application of marginal costing principles.

The principles of marginal costing can be summarized as follows:

- (a) Period fixed costs are a constant amount; therefore, if one extra unit of product is made and sold, total costs will only rise by the variable cost (the *marginal cost*) of production and sales for that unit.
- (b) Also, total costs will fall by the variable cost per unit for each reduction by one unit in the level of activity.
- (c) The additional profit earned by making and selling one extra unit is the extra revenue from its sales minus its variable costs, i.e. the contribution per unit.
- (d) As the volume of activity increases, there will be an increase in total profits (or a reduction in losses) equal to the total revenue minus the total extra variable costs. This is the extra contribution from the extra output and sales.
- (e) The total profit in a period is the total revenue minus the total variable cost of goods sold, minus the fixed costs of the period.

Revenue	xxx
Less: Variable cost of Sales	<u>xxx</u>
Contribution	xxx
Less: Fixed Cost	<u>xxx</u>
Profit	<u>xxx</u>

## BREAK-EVEN CHART

A break-even chart is a graphical representation of marginal costing. It is a pictorial representation of Cost-Volume-Profit relationship. It is a graph showing the amount of fixed and variable costs and the sales revenue at different volumes of operation. It shows at what volume the firm just covers all costs with revenue or break-even.

## ANGLE OF INCIDENCE

This is the angle formed between sales and the total cost line. This angle, formed at the point of intersection of the sales and the total cost lines, indicates the profit earning capacity, and as such, the wider the angle, the greater the profit and vice-versa.

## MARGIN OF SAFETY

The excess of actual sales over break-even point sales is known as the *margin of safety*. An organization whose sales volume is just equal to the break-even volume is making no profit no loss. The margin of safety at break-even point, therefore is nil.

**Margin of Safety (MOS) = Actual Sales – Break-even Sales**

**MOS can be calculated using the formula:  $MOS = \text{Profit}/P/V \text{ ratio}$**

### **Example** *Break-even charts*

XYZ Ltd. makes and sells a single product. The variable cost is ₹ 3/unit and the variable cost of selling is ₹ 1/unit. Fixed costs total ₹ 6000 and the unit sales price is ₹ 6.

XYZ Ltd. budgets to make and sell 4800 units in the next year.

Draw a break-even chart, showing the expected amount of output and sales required to break-even, and the safety margin in the budget.

#### **Solution:**

A break-even chart records the amount of fixed costs, variable costs, total costs and total revenue at all volumes of sales and at a given sales price as follows:

The 'break-even point' is where revenues and total costs are exactly the same, so there is no profit or loss. It may be expressed in terms of units of sale or in terms of sales revenue. Reading from the graph, the break-even point is 3000 units of sale and ₹ 18,000 in sales revenue.

The 'margin of safety' is the amount by which actual output/sales may fall short of the budget without a loss being made, often expressed as a percentage of the budgeted sales volume. It is a rough measure of the risk that XYZ products might make a loss if it fails to achieve its budget. In our example, the margin of safety is calculated as follows:

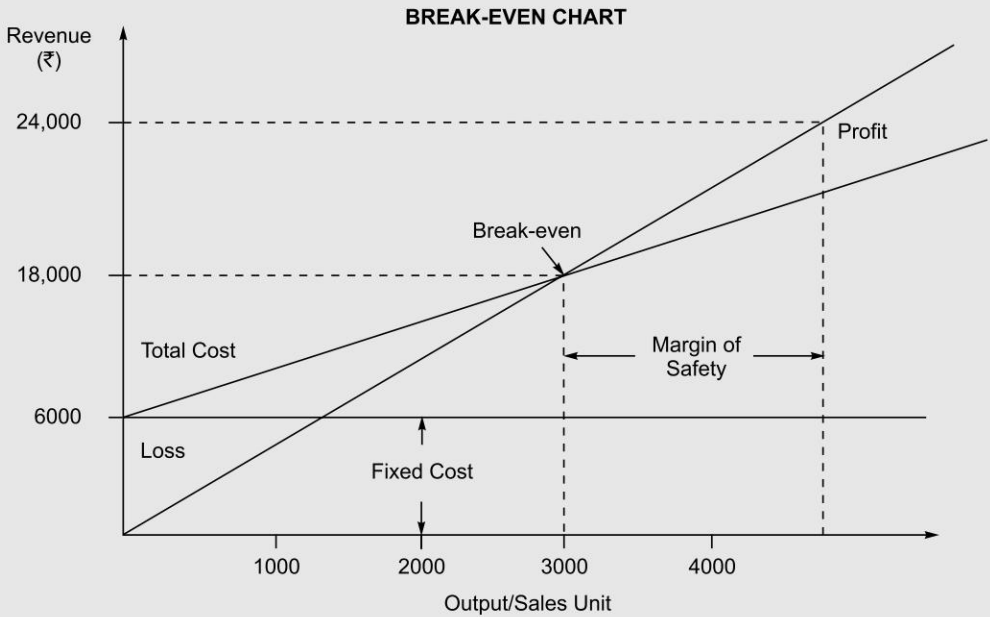
Budgeted Sales: 4800

Break-even Sales: 3000

Margin of Safety: 1800

As a percentage of budgeted sales

$$\begin{aligned}\text{MOS} &= \frac{1800}{4800} \\ &= 37.5\%\end{aligned}$$



A high margin of safety shows a good expectation of profits, even if the budget is not achieved.

## MANAGERIAL USES OF BREAK-EVEN ANALYSIS

1. Determination of operating profit at a given sales volume and adjusting the selling prices of the products manufactured in the context of stiff competition prevailing in the market.
2. Determination of sales volume to earn a desired profit. This is done with the following formula:

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

3. Determination of how much additional sales volume is required to compensate the price reduction. Sometimes, the market conditions may require a businessman to reduce the price of his product. In this circumstance, he has to find out how much more he has to sell to retain his existing profit level.
4. To find out the effect of changes in fixed cost. Total fixed cost may occur due to external factors such as increase in property tax, or due to internal factors such decision to increase salaries. This would have an impact on the break-even point.
5. To find out the effect of changes in variable costs.
6. To find out the effect of changes in combination of factors.



**ILLUSTRATIONS****Cost-profit-Volume Analysis (CVP Analysis)**

1. A restaurant is selling an item of 350 units in a week @ ₹ 10 each wherein 60% of the selling price goes for variable expenses. Its total fixed cost per week amounted to ₹ 2000. How many more units it has to sell to break-even?

(a) 200                      (b) 150                      (c) 400                      (d) None

**Solution:**

$$\text{B.E.P. (in units)} = \text{Fixed Cost} / \text{Contribution per unit}$$

$$\text{Contribution} = \text{Selling Price per unit} - \text{Variable Cost per unit}$$

$$10 - 6 = 4$$

$$\text{Therefore, B.E.P.} = 2000 / 4 = 500 \text{ units}$$

$$\text{No. of units required to break-even} = 500 - 350 = \mathbf{150 \text{ units}}$$

2. The maximum weekly output of a small food processing firm is 2400 units, each unit selling at ₹ 5.00.

Cost of Production	₹ 1.90 per unit
Variable Labour Cost	₹ 0.60 per unit
Variable Overheads	₹ 0.50 per unit
Fixed Labour and Overheads	₹ 2500 per week

Calculate: (a) Sales activity at Break-even point

(b) The net profit at maximum output

**Solution:**

- (a) B.E.P. (in units) = Fixed Cost / Contribution per unit

$$\text{Contribution} = \text{Selling Price per unit} - \text{Variable Cost per unit}$$

$$5 - (1.90 + 0.60 + 0.50) = 2$$

$$\text{Therefore, B.E.P.} = 2500 / 2 = \mathbf{1250 \text{ units}}$$

- (b) Net Profit at maximum output:

Marginal Cost Equation:

$$\text{Selling Price } (2400 \times 5) = 12,000$$

$$\text{Less: Variable Cost } (2400 \times 3) = \underline{7200}$$

$$\text{Contribution} = 4800$$

$$\text{Less: Fixed Cost} = \underline{2500}$$

$$\mathbf{\text{Profit} = \underline{2300}}$$

3. A restaurant's sales vary from 1000 to 10,000 covers in a month and it operates at a food cost of 40%. Fixed cost of the restaurant for the above month amounted to ₹ 2,40,000. The average spending power is ₹ 100 per customer. Draw a break-even point chart and calculate B.E.P. in units and in rupees.

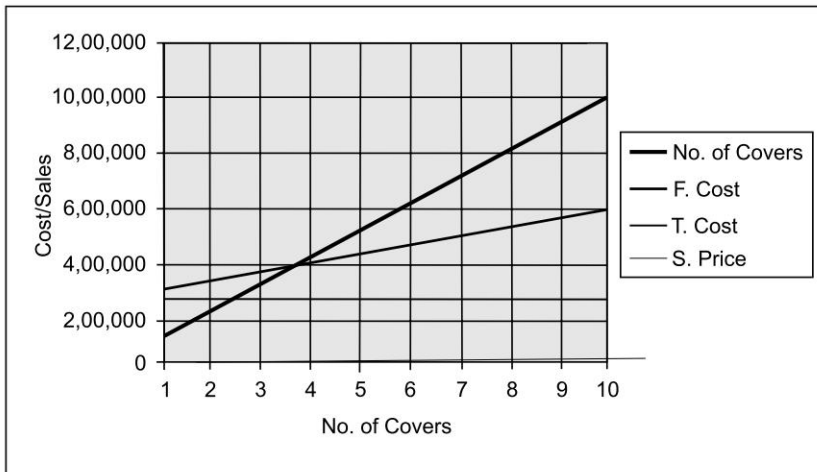
**Solution:**

(a) B.E.P. (in units) = Fixed Cost/Contribution per unit

$$\begin{aligned}\text{Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ &= 100 - 40 = 60\end{aligned}$$

Therefore, B.E.P. =  $2,40,000/60 = 4000$  units

Break-even Analysis Table					
No. of covers	Variable Cost (40%)	Fixed Cost	Total Cost	S. Price (₹ 100/unit)	P/L
1000	40,000	2,40,000	2,80,000	1,00,000	-1,80,000
2000	80,000	2,40,000	3,20,000	2,00,000	-1,20,000
3000	1,20,000	2,40,000	3,60,000	3,00,000	-60,000
<b>4000</b>	<b>1,60,000</b>	<b>2,40,000</b>	<b>4,00,000</b>	<b>4,00,000</b>	<b>0</b>
5000	2,00,000	2,40,000	4,40,000	5,00,000	60,000
6000	2,40,000	2,40,000	4,80,000	6,00,000	1,20,000
7000	2,80,000	2,40,000	5,20,000	7,00,000	1,80,000
8000	3,20,000	2,40,000	5,60,000	8,00,000	2,40,000
9000	3,60,000	2,40,000	6,00,000	9,00,000	3,00,000
10,000	4,00,000	2,40,000	6,40,000	10,00,000	3,60,000



4. A restaurant's sales vary from 1000 to 10,000 covers in a month and it operates at a food cost of 40%. Fixed cost of the restaurant for the above month amounted to ₹ 2,40,000 per

month. The average spending power is ₹ 100 per customer. Calculate break-even covers, break-even sales and margin of safety in rupees.

**Solution:**

$$\begin{aligned} \text{(a) B.E.P. (in covers)} &= \text{Fixed Cost/Contribution per unit} \\ \text{Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ &= 100 - 40 = 60 \\ \text{Therefore, B.E.P.} &= 2,40,000/60 = \mathbf{4000 \text{ units}} \end{aligned}$$

$$\begin{aligned} \text{(b) Break-even sales} &= \text{Break-even Covers} \times \text{Selling price per cover} \\ &= 4000 \times 100 = \mathbf{₹ 4,00,000} \end{aligned}$$

$$\begin{aligned} \text{(c) Margin of Safety} &= \text{Maximum Sales} - \text{Break-even Sales} \\ &= 10,00,000 - 4,00,000 = \mathbf{₹ 6,00,000} \end{aligned}$$

5. A restaurant's sales vary from 15,000 to 20,000 covers in a month. It operates at a food cost of 50% and average spending power is ₹ 140 per customer. The fixed cost of the restaurant amounted to ₹ 7,00,000 per month. From the above information, calculate:

- Break-even Point in units
- Break-even Sales
- Margin of Safety in units
- Profit at maximum level

**Solution:**

$$\begin{aligned} \text{(a) B.E.P. (in units)} &= \text{Fixed Cost/Contribution per unit} \\ \text{Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ &= 140 - 70 = 70 \\ \text{Therefore, B.E.P.} &= 7,00,000/70 = \mathbf{10,000 \text{ units}} \end{aligned}$$

$$\begin{aligned} \text{(b) Break-even Sales (in rupees)} &= \text{Break-even Units} \times \text{Selling Price per unit} \\ &= 10,000 \times 140 = \mathbf{₹ 14,00,000} \end{aligned}$$

$$\begin{aligned} \text{(c) Margin of Safety (in units)} &= \text{Maximum Sales} - \text{Break-even Sales} \\ &= 20,000 - 10,000 = \mathbf{10,000 \text{ units}} \end{aligned}$$

(d) Net Profit at maximum output:

Marginal Cost Equation:	₹
Selling Price (20,000 × 140)	= 28,00,000
Less: Variable Cost (20,000 × 70)	= 14,00,000
Contribution	= 14,00,000
Less: Fixed Cost	= 7,00,000
<b>Profit</b>	<b>= 7,00,000</b>

6. The selling price of a unit is ₹ 1. Its variable cost is 45 paise and fixed cost is ₹ 275. Find out the break-even point in units.

**Solution:**

$$\begin{aligned} \text{(a) B.E.P. (in units)} &= \text{Fixed Cost/Contribution per unit} \\ \text{Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ &= 1 - 0.45 = 0.55 \end{aligned}$$

$$\text{Therefore, B.E.P.} = 275/0.55 = \mathbf{500 \text{ units}}$$

7. From the following particulars, calculate: (a) contribution, (b) P/V ratio, and (c) break-even in units and in rupees (d) What will be the selling price per unit if the break-even is brought down to 25,000 units?

Fixed Expenses	₹ 1,50,000
Variable cost per unit	₹ 10
Selling price per unit	₹ 15

**Solution:**

$$\begin{aligned} \text{(a) Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ 15 - 10 &= \mathbf{5 \text{ per unit}} \end{aligned}$$

$$\begin{aligned} \text{(b) PV Ratio} &= \text{Contribution/Sales} \times 100 \\ 5/15 \times 100 &= \mathbf{33.33\%} \end{aligned}$$

$$\begin{aligned} \text{(c) B.E.P. (in units)} &= \text{Fixed Cost/Contribution per unit} \\ \text{Contribution} &= \text{Selling Price per unit} - \text{Variable Cost per unit} \\ 15 - 10 &= 5 \text{ per unit} \end{aligned}$$

$$\text{Therefore, B.E.P.} = 1,50,000/5 = \mathbf{30,000 \text{ units}}$$

$$\begin{aligned} \text{Break-even sales (in rupee)} &= \text{Break-even Units} \times \text{Selling Price per unit} \\ &= 30,000 \times 15 = \mathbf{₹ 4,50,000} \end{aligned}$$

or

$$\begin{aligned} \text{B.E.P. (in rupee)} &= \text{Fixed Cost/PV Ratio} \\ &= 1,50,000/33.33\% \\ &= \frac{1,50,000 \times 100}{33.33} \\ &= \mathbf{₹ 4,50,000} \end{aligned}$$

$$\begin{aligned} \text{(d) Selling price if the BEP is brought down to 25,000 units:} \\ &= 15/30,000 \times 25,000 = \mathbf{₹ 12.50} \end{aligned}$$

8. From the following figures, calculate: (a) P/V ratio, (b) Break-even point, and (c) sales to earn a profit of ₹ 1,20,000.

Sales ₹ 6,00,000      Variable Costs ₹ 3,75,000      Fixed Costs ₹ 1,80,000

**Solution:**

$$\begin{aligned}
 \text{(a) PV Ratio} &= \text{Contribution/Sales} \times 100 \\
 &= \text{Contribution} = \text{Sales} - \text{Variable Cost} \\
 &= 6,00,000 - 3,75,000 = 2,25,000 \\
 &= 2,25,000/6,00,000 \times 100 \\
 &= \mathbf{37.5\%}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) B.E.P. (in rupee)} &= \text{Fixed Cost/PV Ratio} \\
 &= 1,80,000/37.5\% \\
 &= \mathbf{₹ 4,80,000}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c) Sales to earn a profit of ₹ 1,20,000} \\
 &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV ratio}} \\
 &= \frac{1,80,000 + 1,20,000 \times 100}{37.5} \\
 &= \mathbf{₹ 8,00,000}
 \end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price	= 8,00,000
Less: Variable Cost (62.5%)	= <u>5,00,000</u>
Contribution	= 3,00,000
Less: Fixed Cost	= <u>1,80,000</u>
<b>Profit</b>	= <u><b>1,20,000</b></u>

9. From the following information, calculate (a) P/V ratio, (b) break-even point and (c) ascertain by how much the value of sales must be increased for the company to break-even.

Sales ₹ 4,00,000      Fixed Costs ₹ 1,80,000      Variable Costs ₹ 2,70,000

**Solution:**

$$\begin{aligned}
 \text{(a) P/V Ratio} &= \text{Contribution/Sales} \times 100 \\
 &= \text{Contribution} = \text{Sales} - \text{Variable Cost} \\
 &= 4,00,000 - 2,70,000 = 1,30,000 \\
 &= 1,30,000/4,00,000 \times 100 \\
 &= \mathbf{32.5\%}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) B.E.P. (in rupee)} &= \text{Fixed Cost/P/V Ratio} \\
 &= 1,80,000/32.5\% \\
 &= \frac{1,80,000 \times 100}{32.5} \\
 &= \mathbf{₹ 5,53,846}
 \end{aligned}$$

(c) Sales to earn a profit of ₹ 1,20,000

$$\begin{aligned}
 &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV ratio}} \\
 &= \frac{1,80,000 + 1,20,000 \times 100}{37.5} \\
 &= \text{₹ } 8,00,000
 \end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price	= 8,00,000
Less: Variable Cost (62.5%)	= 5,00,000
Contribution	= 3,00,000
Less: Fixed Cost	= 1,80,000
<b>Profit</b>	= <b>1,20,000</b>

10. From the following data, calculate (a) break-even point expressed in amount of sales in rupees. (b) How many units must be sold to earn a profit of ₹ 1,20,000 per year? (c) How many units are to be sold to earn a net income of 15% of sales?

	₹
Selling price per unit	40
Variable manufacturing Cost per unit	22
Variable Selling Cost per unit	3
Fixed Factory Overheads	1,60,000
Fixed Selling Cost	20,000

**Solution:**

(a) Break-even Point (in Sales Value): Fixed Cost/Contribution/unit × Selling Price/unit

$$\begin{aligned}
 \text{Fixed Cost} &= \text{Fixed Factory overheads} + \text{Fixed Selling cost} \\
 &= 1,60,000 + 20,000 = \text{1,80,000}
 \end{aligned}$$

$$\begin{aligned}
 \text{Variable Cost} &= \text{Variable Manufacturing Cost} + \text{Variable Selling Cost} \\
 &= 22 + 3 = \text{25}
 \end{aligned}$$

$$\begin{aligned}
 \text{Contribution/unit} &= \text{Selling Price/unit} - \text{Variable Cost per unit} \\
 &= 40 - 25 = \text{15}
 \end{aligned}$$

$$\text{B.E.P.} = 1,80,000 / 15 \times 40 = \text{₹ } 4,80,000$$

(b) Sales required to earn a profit of ₹ 1,20,000 per year

$$\begin{aligned}
 &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \\
 &= \frac{1,80,000 + 1,20,000}{15} \\
 &= \text{20,000 units}
 \end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price (20,000 × 40)	= 8,00,000
Less: Variable Cost (20,000 × 25)	= <u>5,00,000</u>
Contribution	= 3,00,000
Less: Fixed Cost	= <u>1,80,000</u>
<b>Profit</b>	= <b><u>1,20,000</u></b>

(c) Suppose number of units to be sold = N

$$N = \frac{\text{Fixed Cost} + \text{Desired profit}}{\text{Contribution/unit}}$$

$$N = \frac{1,80,000 + 15/100(N \times 40)}{15}$$

$$15N = 1,80,000 + 6N$$

or  $9N = 1,80,000$

$$N = \mathbf{20,000 \text{ units}}$$

11. The maximum weekly out put of a small food processing firm is 2400 units, each unit selling at ₹ 25.

Costs of production are:	Raw materials (Variable)	₹ 9.50
	Labour Costs (Variable)	₹ 3.00
	Overheads (Variable)	₹ 2.50

Fixed Cost per week ₹ 12,500.

Calculate:

- Sales activity at break-even point
- The net profit at maximum output
- What should be the sales activity to achieve a profit of ₹ 50,000?
- Suppose the fixed cost is increased by ₹ 2500 and raw materials cost increased to ₹ 11.50. Will there be a change in BEP? If so, what will be the new BEP?

**Solution:**

$$\begin{aligned} \text{(i) Break-even point (in units)} &= \text{Fixed Cost/Contribution per unit} \\ &= 12,500/(25 - (9.50 + 3.00 + 2.50)) \\ &= \mathbf{1250 \text{ units}} \end{aligned}$$

$$\text{Break-even point (in Rupee value)} = 1250 \times 25 = \mathbf{₹ 31,250}$$

(ii) Net Profit at maximum output

Marginal Cost Equation:	₹
Selling Price (2400 × 25)	= 60,000

Less: Variable Cost (2400 × 15)	= 36,000
Contribution	= 24,000
Less: Fixed Cost	= 12,500
<b>Profit</b>	= <b>11,500</b>

(iii) Sales required to earn desired profit of ₹ 50,000

$$\begin{aligned}
 &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \\
 &= \frac{12,500 + 50,000}{10} \\
 &= \mathbf{6250 \text{ units}}
 \end{aligned}$$

(iv) BEP in the Fixed Cost increased by ₹ 2500 and Raw material cost increased to ₹ 11.50

$$\begin{aligned}
 \text{Changed Fixed Cost} &= 12,500 + 2500 = 15,000 \\
 \text{Changed Variable Cost} &= 11.50 + 3.00 + 2.50 = 17 \\
 \text{BEP (in units)} &= \text{Fixed Cost} / \text{Contribution per unit} \\
 &= 15,000 / 25 = 17 \\
 &= 15,000 / 8 \\
 &= \mathbf{1875 \text{ units}}
 \end{aligned}$$

12. Revenue is ₹ 5,00,000, fixed costs are ₹ 3,00,000, and net income is ₹ 3,00,000. If the selling price per unit is ₹ 50, and variable cost is 40%, then B.E.P. in units will be:

(a) 10,000 (b) 50,000 (c) 1,20,000

**Solution:**

$$\begin{aligned}
 \text{BEP in units} &= \text{Fixed Cost} / \text{Contribution per unit} \\
 &= \text{Contribution} = \text{Selling Price per unit} - \text{Variable Cost per unit} \\
 &= 3,00,000 / (50 - 20) \\
 &= 3,00,000 / 30 = \mathbf{10,000 \text{ units}}
 \end{aligned}$$

13. The following information relates to the catering operations at an airport for the first two quarters of the year:

	Sale (₹)	Profit/Loss (₹)
1st Quarter		
January	7000	1800 Loss
February	4000	3300 Loss
March	9000	900 Loss
<b>Total</b>	<b>20,000</b>	<b>6000 Loss</b>
2nd Quarter		
April	14,000	1350 Profit
May	12,000	300 Profit
June	28,000	7650 Profit
<b>Total</b>	<b>54,000</b>	<b>9300 Profit</b>



Throughout the year, the fixed costs for each quarter remain constant, as also does the percentage of variable cost to sales. Sales for the last two quarters of the year amount to ₹ 80,000 and ₹ 26,000, respectively.

Calculate:

- (i) Variable cost percentage
- (ii) P/V Ratio
- (iii) Fixed cost for the year
- (iv) The Profit or loss for the year
- (v) The Break-even Point

**Solution:**

- (i) Variable Cost Percentage

$$\begin{aligned}
 &= 100 - \text{P/V Ratio} \\
 &= 100 - 45\% \\
 &= \mathbf{55\%}
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) P/V Ratio} &= \frac{\text{Change in Profit in two periods}}{\text{Change in Sales in two periods}} \\
 &= \frac{9300 - (6000)}{54,000 - 20,000} \\
 &= 15,300/34,000 = \mathbf{45\%}
 \end{aligned}$$

- (iii) Fixed Cost per year

Fixed Cost = Contribution – Profit or Loss

$$\begin{aligned}
 \text{Contribution for one quarter} &= \text{Sales} \times \text{P/V ratio} \\
 &= 20,000 \times 45\% \\
 &= \mathbf{₹ 9000}
 \end{aligned}$$

$$\begin{aligned}
 \text{Fixed for the first quarter} &= 9000 - (6000) \\
 &= \mathbf{15,000}
 \end{aligned}$$

$$\text{Therefore, Fixed Cost for the year} = 15,000 \times 4 = \mathbf{₹ 60,000}$$

- (iv) Profit/Loss for the year = Sales – (Variable Cost + Fixed Cost)

$$\begin{aligned}
 \text{Loss for the First Quarter} &= \mathbf{₹ 6000} \\
 \text{Profit for the Second Quarter} &= \mathbf{₹ 9300} \\
 \text{Profit for the Third Quarter} &= \mathbf{₹ 21,000} \quad (80,000 - 44,000 + 15,000) \\
 \text{Loss for the Fourth Quarter} &= \mathbf{₹ (3300)} \quad (26,000 - 14,300 + 15,000) \\
 \text{Total Profit} &= \mathbf{₹ 21,000}
 \end{aligned}$$

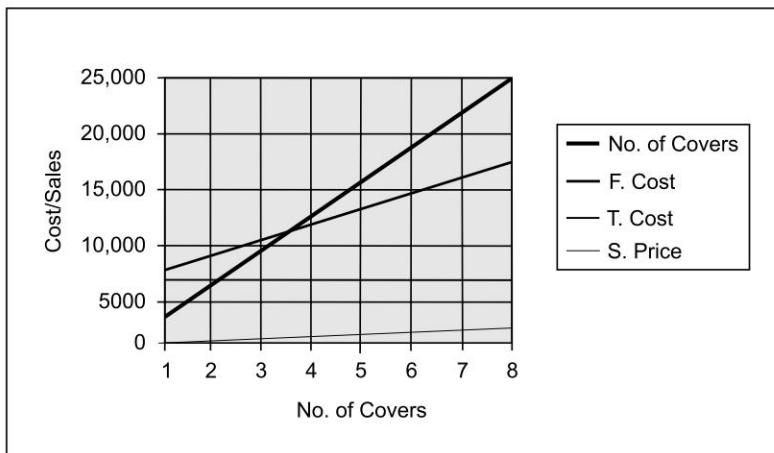
$$\begin{aligned}
 \text{(v) Break-even Point in ₹} &= \text{Fixed Cost/P/V Ratio} \\
 &= 15,000/45\% \\
 &= \mathbf{₹ 33,333.33}
 \end{aligned}$$

14. A restaurant's sales vary from 1500 to 2000 covers a month. The fixed cost of the restaurant is ₹ 7000 and it operates at a food cost of 30%. If the average cover charge is ₹ 10, find out the break-even quantity of the restaurant with the help of a chart. Also, indicate the margin of safety.

**Solution:**

$$\begin{aligned}
 \text{B.E.P. in units} &= \text{Fixed Cost} / \text{Contribution per unit} \\
 &= \text{Contribution} = \text{Selling Price} - \text{Variable Cost} \\
 &= 7000 - (10 - 3) \\
 &= 7000 / 7 = \mathbf{1000 \text{ units}}
 \end{aligned}$$

Break-even Analysis Table				
No. of covers	V. Cost (30%)	F. Cost	T. Cost	S. Price (₹ 10/ut.)
250	750	7000	7750	2500
500	1500	7000	8500	5000
750	2250	7000	9250	7500
<b>1000</b>	<b>3000</b>	7000	<b>10,000</b>	<b>10,000</b>
1250	3750	7000	10,750	12,500
1500	4500	7000	11,500	15,000
1750	5250	7000	12,250	17,500
2000	6000	7000	13,000	20,000



15. A restaurant's sales vary from 4000 to 10,000 covers in a month and it operates at a food cost of 40%. The fixed cost of the restaurant is ₹ 48,000. Calculate:  
 (a) B.E.P. in units, (b) B.E.P. in rupees, and (c) Margin of Safety in rupees.

**Solution:**

(a) B.E.P. in units = Fixed Cost/Contribution per unit

Let us assume selling price as ₹ 100

$$\begin{aligned}\text{Contribution} &= \text{Selling Price} - \text{Variable Cost} \\ &= 100 - 40 = 60 \\ &= 48,000/60 = \mathbf{800 \text{ units}}\end{aligned}$$

(b) B.E.P. in rupees = Fixed Cost/P/V Ratio

$$\begin{aligned}&= 48,000/60\% \\ &= \mathbf{₹ 80,000}\end{aligned}$$

(c) Margin of Safety in rupees = Maximum Sales – Break-even Sales

$$= 1,00,000 - 80,000 = \mathbf{₹ 20,000}$$

16. X Ltd. produces a product, with a whole sale price of ₹ 20 while the variable cost is ₹ 12. Fixed expenses are ₹ 2000.

Calculate: (i) B.E.P. (ii) Profits when 3000 units are sold, (iii) Sales required to earn a profit of ₹ 6000, and (iv) BEP when the sales reduces by 10%.

**Solution:**

(i) B.E.P. in units = Fixed Cost/Contribution per unit

$$\begin{aligned}&= 2000/(20 - 12) \\ &= 2000/8 \\ &= \mathbf{250 \text{ units}}\end{aligned}$$

(ii) Profits when 3000 units are sold

Marginal Cost Equation:	₹
Selling Price (3000 × 20)	= 60,000
Less: Variable Cost (3000 × 12)	= 36,000
Contribution	= 24,000
Less: Fixed Cost	= 2000
<b>Profit</b>	= <b>22,000</b>

(iii) Sales required to earn ₹ 6000 profit:

$$\begin{aligned}&= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \\ &= \frac{2000 + 6000}{8} \\ &= \mathbf{1000 \text{ units}}\end{aligned}$$

$$\text{or } 1000 \times 20 = \mathbf{₹ 20,000}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price (1000 × 20)	= 20,000
Less: Variable Cost (1000 × 12)	= 12,000
Contribution	= 8000
Less: Fixed Cost	= 2000
<b>Profit</b>	= <b>6000</b>

(iv) BEP when the sales reduced by 10%

$$\begin{aligned}\text{Selling Price} &= 20 - (20 \times 10\%) \\ &= 20 - 2 = 18\end{aligned}$$

$$\begin{aligned}\text{B.E.P. in units} &= \text{Fixed Cost} / \text{Contribution per unit} \\ &= 2000 / (18 - 12) \\ &= 2000 / 6 \\ &= \mathbf{333.33 \text{ units}}\end{aligned}$$

17. The following are the trading results of the Highland Restaurant for the first three quarters of the year:

	<b>Qtr 1</b>	<b>Qtr 2</b>	<b>Qtr 3</b>
Number of covers	7500	18,750	26,250
	₹	₹	₹
Sales	30,000	75,000	1,05,000
Gross Profit	<u>16,500</u>	<u>41,250</u>	<u>57,750</u>
Labour Cost	<u>7500</u>	<u>14,250</u>	<u>18,750</u>
Overheads	<u>16,125</u>	<u>20,625</u>	<u>23,625</u>
Total Labour and Overheads	<u>23,625</u>	<u>34,875</u>	<u>42,375</u>
<b>Net Profit (Loss)</b>	<b>(7125)</b>	<b>6375</b>	<b>15,375</b>

Average Spending Power is expected to be constant throughout the year. The number of covers expected in the last quarter is 15,000. Both labour and overheads are semi-fixed costs and will behave in the last quarter as in the preceding quarters. Cost of sales will be in the same ratio to sales.

You are required:

(a) To calculate

- The fixed and variable elements of labour and overheads
- The budgeted trading results for the fourth quarter
- The contribution per cover towards fixed costs and profit.

- (b) To prepare break-even chart for the year for 0 to 67,500 covers showing sales, fixed costs, total costs, the number of covers at break-even point and the margin of safety at 67,650 covers.

**Solution:**

	<i>Qtr 1</i>	<i>Qtr 2</i>	<i>Qtr 3</i>	<i>Qtr 4</i>
Number of covers	7500	18,750	26,250	<b>15,000</b>
Sales (₹ 4/cover)	₹ 30,000	₹ 75,000	₹ 1,05,000	<b>₹ 60,000</b>
Gross Profit	16,500	41,250	57,750	<b>33,000</b>
Labour Cost				
Fixed	3000	3000	3000	<b>3000</b>
Variable	4500	11,250	15,750	<b>9000</b>
Overheads				
Fixed	13,125	13,125	13,125	<b>13,125</b>
Variable	3000	7500	10,500	<b>6000</b>
Total Labour and Overheads	23,625	34,875	42,375	<b>31,125</b>
<b>Net Profit (Loss)</b>	<b>(7125)</b>	<b>6375</b>	<b>15,375</b>	<b>1875</b>

**Working Notes:**

Labour Cost (Variable) = Change in Labour Cost/Change in No. of Covers

$$\begin{aligned}
 &= \frac{14,250 - 7500}{18,750 - 7500} \\
 &= 6750/11,250 = ₹ 0.60
 \end{aligned}$$

Overheads (Variable) = Change in Overheads/Change in no. of Covers

$$\begin{aligned}
 &= \frac{20,625 - 16,125}{18,750 - 7500} \\
 &= 4500/11,250 = ₹ 0.40
 \end{aligned}$$

18. Calculate the break-even point and verify the same using a marginal cost equation from the following figures:

Sales	₹ 3,00,000
Fixed Expenses	₹ 75,000
Direct Materials	₹ 1,00,000
Direct Labour	₹ 60,000
Direct Expenses	₹ 40,000

**Solution:**

$$\text{B.E.P. (in Rupees)} = \text{Fixed Cost/P/V ratio}$$

$$\text{P/V ratio} = \text{Contribution/Sales}$$

$$\text{Contribution} = \text{Sales} - \text{Variable Cost}$$

$$\begin{aligned}\text{Variable Cost} &= \text{Direct Material} + \text{Direct Labour} + \text{Direct Expenses} \\ &= 1,00,000 + 60,000 + 40,000 = 2,00,000\end{aligned}$$

$$\text{Therefore, Contribution} = 3,00,000 - 2,00,000 = 1,00,000$$

$$\text{Therefore, P/V ratio} = 1,00,000/3,00,000 \times 100 = 33.33\%$$

$$\begin{aligned}\text{Hence break-even point} &= 75,000/33.33\% \\ &= \text{₹ } 2,25,000\end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price	= 2,25,000
Less: Variable Cost (66.67%)	= 1,50,000
Contribution	= 75,000
Less: Fixed Cost	= 75,000
<b>Profit/Loss</b>	= <b>Nil</b>

19. The fixed expenses of an industrial concern amount to ₹ 1,80,000, the variable cost per unit of production is ₹ 29, and the selling price is ₹ 44 per unit. Calculate the B.E.P.

**Solution:**

$$\begin{aligned}\text{B.E.P. in units} &= \text{Fixed Cost/Contribution per unit} \\ &= 1,80,000/(44 - 29) \\ &= 1,80,000/15 \\ &= \text{12,000 units}\end{aligned}$$

20. A company produces and sells 100 units of 'A' per month at ₹ 20 each. The marginal cost per unit is ₹ 12 and the fixed cost is ₹ 300 per month. It is proposed to reduce price by 20%. Find the additional sales required to earn the same amount of profit as before. Also find out the B.E.P.

**Solution:**

$$\begin{aligned}\text{(i) B.E.P. in units} &= \text{Fixed Cost/Contribution per unit} \\ &= 300/(20 - 12) \\ &= 300/8 \\ &= \text{37.5 units}\end{aligned}$$

(ii) Profit earned @ ₹ 20 per unit as selling price for 100 units

Marginal Cost Equation:	₹
Selling Price (100 × 20)	= 2000
Less: Variable Cost (100 × 12)	= <u>1200</u>
Contribution	= 800
Less: Fixed Cost	= <u>300</u>
<b>Profit/Loss</b>	= <b><u>500</u></b>

(iii) Sales required to earn the same profit (₹ 500) as above if the price is reduced by 20%

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

- Reduced price = 20 – (20 × 20%)  
 = 20 – 4 = ₹ 16  
 =  $\frac{300 + 500}{16 - 12}$   
 = 800/4  
 = **200 units**

#### Verification:

Marginal Cost Equation:	₹
Selling Price (200 × 16)	= 3200
Less: Variable Cost (200 × 12)	= <u>2400</u>
Contribution	= 800
Less: Fixed Cost	= <u>300</u>
<b>Profit/Loss</b>	= <b><u>500</u></b>

21. From the following figures, calculate the sales required to earn a profit of ₹ 60,000.

Sales ₹ 3,00,000      Marginal Cost ₹ 1,50,000      Fixed Cost ₹ 75,000

#### Solution:

Sales required to earn a profit of ₹ 60,000

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

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

$$\begin{aligned} \text{Contribution} &= \text{Sales} - \text{Marginal Cost} \\ &= 3,00,000 - 1,50,000 \\ &= 1,50,000 \end{aligned}$$

$$\begin{aligned} \text{Therefore, P/V ratio} &= 1,50,000/3,00,000 \times 100 \\ &= \mathbf{50\%} \end{aligned}$$

$$\begin{aligned}\text{Sales required} &= \frac{75,000 + 60,000}{50\%} \\ &= ₹ 2,70,000\end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price	= 2,70,000
Less: Variable Cost (50%)	= 1,35,000
Contribution	= 1,35,000
Less: Fixed Cost	= 75,000
<b>Profit/Loss</b>	<b>= 60,000</b>

22. Happy Restaurant Ltd. gives the following results for the year 2004:

Sales ₹ 3,00,000,      Marginal Cost ₹ 1,65,000,      Fixed Cost ₹ 75,000,  
Profit ₹ 60,000

Calculate the margin of safety.

**Solution:**

Margin of Safety = Actual Sales – Break-even Sales

Actual Sales = ₹ 3,00,000

Break-even Sales = Fixed Cost/P/V ratio

P/V ratio = Contribution/Sales × 100

$$\begin{aligned}\text{Contribution} &= \text{Sales} - \text{Marginal Cost} \\ &= 3,00,000 - 1,65,000 \\ &= 1,35,000\end{aligned}$$

$$\begin{aligned}\text{Therefore, P/V ratio} &= 1,35,000/3,00,000 \times 100 \\ &= 45\%\end{aligned}$$

$$\begin{aligned}\text{B.E.P.} &= 75,000/45\% \\ &= ₹ 1,66,667\end{aligned}$$

$$\begin{aligned}\text{Margin of Safety} &= 3,00,000 - 1,66,667 \\ &= ₹ 1,33,333\end{aligned}$$

23. A company producing a single product that sells for ₹ 10 per unit has budgeted the following costs to make and sell over its normal operating ranges:

Units Sold	Total Costs
10,000	₹ 80,000
8000	₹ 68,000

Determine the break-even point and P/V ratio.



**Solution:**

Break-even Point = Fixed Cost/P/V ratio

P/V ratio = Change in Profit/Change in Sales

Profit = Sales – Cost

Sales = 10,000 × 10 = 1,00,000      8000 × 10 = 80,000

Cost = 80,000      = 68,000

Profit = 20,000      = 12,000

$$\text{P/V ratio} = \frac{20,000 - 12,000}{1,00,000 - 80,000}$$

$$= 8000/20,000 = 40\%$$

B.E.P. = Fixed Cost/P/V ratio

Fixed Cost = Contribution – Profit

Contribution = 100 – 40%

$$= 60\%$$

That is, 1,00,000 × 60% = 60,000

Fixed Cost = 60,000 – 20,000 = ₹ 40,000

B.E.P. = 40,000/40%

$$= ₹ 1,00,000$$

**Verification:**

Marginal Cost Equation: ₹

Selling Price = 1,00,000

Less: Variable Cost (60%) = 60,000

Contribution = 40,000

Less: Fixed Cost = 40,000

**Profit/Loss = Nil**

24. You are given the following data for the year 2005 for a factory:

Output 40,000 units

Fixed expenses ₹ 2,00,000

Variable expenses per unit ₹ 10

Selling Price per unit ₹ 20

How many units must be produced and sold if the selling price is reduced by 10% in order to give the same profit? Show by break-even chart what will be the new break-even point?

**Solution:**

Profit when the selling price is ₹ 20 unit

Marginal Cost Equation:	₹
Selling Price (40,000 × 20)	= 8,00,000
Less: Variable Cost (40,000 × 10)	= 4,00,000
Contribution	= 4,00,000
Less: Fixed Cost	= 2,00,000
<b>Profit/Loss</b>	<b>= 2,00,000</b>

**Units to be produced and sold if the price is reduced by 10%:**

$$\begin{aligned}
 20 - (20 \times 10\%) &= 18 \\
 &= \frac{\text{Fixed cost} + \text{Desired Profit}}{\text{Contribution/unit}} \\
 &= \frac{2,00,000 + 2,00,000}{18 - 10} \\
 &= 4,00,000/8 = \mathbf{50,000 \text{ units}}
 \end{aligned}$$

**Verification:**

Marginal Cost Equation:	₹
Selling Price (50,000 × 18)	= 9,00,000
Less: Variable Cost (50,000 × 10)	= 5,00,000
Contribution	= 4,00,000
Less: Fixed Cost	= 2,00,000
<b>Profit/Loss</b>	<b>= 2,00,000</b>

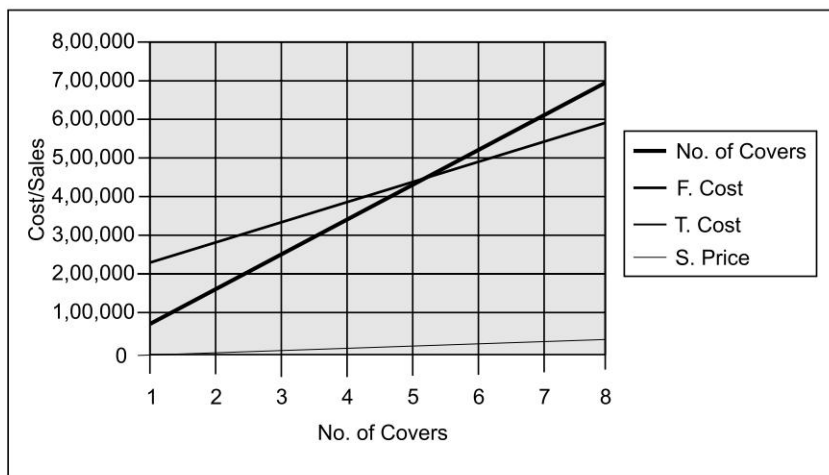
**Break-even Point when price is reduced by 10%:**

$$\begin{aligned}
 &= \text{Fixed Cost/Contribution/unit} \\
 &= 2,00,000/18 - 10 \\
 &= 2,00,000/8 \\
 &= \mathbf{25,000 \text{ units}}
 \end{aligned}$$

No. of Covers	F. Cost	T. Cost	S. Price
5000	2,00,000	2,50,000	90,000
10,000	2,00,000	3,00,000	1,80,000
15,000	2,00,000	3,50,000	2,70,000

*Contd.*

20,000	2,00,000	4,00,000	3,60,000
<b>25,000</b>	<b>2,00,000</b>	<b>4,50,000</b>	<b>4,50,000</b>
30,000	2,00,000	5,00,000	5,40,000
35,000	2,00,000	5,50,000	6,30,000
40,000	2,00,000	6,00,000	7,20,000



### Objective Type Questions

Fill in the blanks:

- \_\_\_\_\_ the level of activity where the total cost equals total selling price.
- \_\_\_\_\_ is the difference between the sales and variable cost.
- Angle of \_\_\_\_\_ is the angle formed between sales and the total cost line.
- The excess of actual sales over break-even point sales is known as \_\_\_\_\_.
- Break point is calculated by \_\_\_\_\_.

### Review Questions

- What is break-even analysis?
- What is cost-profit-volume analysis?
- Give marginal costing equation.
- What do you mean by margin of safety and angle of incidence?
- Write short notes on:
  - Contribution
  - Margin of safety

- (c) Break-even point
- (d) Volume forecasting
- 6. What are the principles of marginal costing?
- 7. What is a break-even chart?
- 8. Explain briefly with the help of a diagram the concept of break-even analysis.
- 9. What are the advantages of CVP analysis?
- 10. What are the assumptions under break-even analysis regarding costs?
- 11. How are the cost classified for the purpose of CVP analysis?
- 12. What do you understand by break-even analysis? What are its managerial uses?

### Exercises

1. Find out:
  - (a) P/V Ratio (b) B.E.P. (c) Net profit if sales were ₹ 2,50,000, (d) Sales to get net profit of ₹ 70,000. Sales ₹ 2,00,000, Variable cost ₹ 1,50,000, Fixed cost ₹ 15,000.
2. Find out P/V Ratio, Net profit if sales were ₹ 3,00,000, sales to get a net profit of ₹ 30,000, Fixed cost ₹ 20,000, Variable cost ₹ 1,00,000, Sales ₹ 3,50,000.
3. Find out B.E.P. Sales ₹ 1,00,000, Fixed cost ₹ 20,000, Profit ₹ 30,000.
4. Find out P/V ratio, B.E.P., Profit when sales amount to ₹ 12,00,000, Sales required to earn a profit of ₹ 2,00,000, Variable cost ₹ 6,00,000, Fixed cost ₹ 3,00,000, Net Profit ₹ 1,00,000.
5. Find out the profit when sales ₹ 20,000, Fixed cost ₹ 40,000, B.E.P ₹ 1,60,000.
6. Find sales when Fixed cost ₹ 20,000, Profit ₹ 10,000, B.E.P. ₹ 40,000.
7. Calculate P/V ratio, BEP, Sales required to earn a profit of ₹ 4,50,000. Fixed cost ₹ 90,000, Variable cost per unit is as follows:
 

Direct Material ₹ 5, Direct Labour ₹ 2, Direct Expenses ₹ 2, Selling Price per unit ₹ 12.
8. Find out P/V ratio, B.E.P. Sales required to earn a profit of ₹ 1,60,000. Selling price per unit ₹ 40, Variable cost per unit is Direct Materials ₹ 10, Direct Labour ₹ 7, Variable O.H. 100% of Direct Labour, Fixed cost ₹ 64,000.
9. Calculate B.E.P. Margin of Safety and Sales required to earn a profit of ₹ 50,000. Sales ₹ 4,00,000, Fixed cost ₹ 75,000. Total variable cost is Direct Materials ₹ 2,00,000, Direct Labour ₹ 60,000, Direct Expenses ₹ 40,000.
10. Find out P/V ratio, Margin of Safety. Sales turnover and the profit during two periods are as follows:

<i>Year</i>	<i>Sales</i>	<i>Profit</i>
2007	1,40,000	15,000
2008	1,60,000	20,000

Calculate B.E.P. Sales required to earn a profit of ₹ 40,000 and Margin of Safety of both the period.

11. Calculate P/V ratio, BEP, Fixed cost, Sales required to earn a profit of ₹ 3000, Profit when sales ₹ 8000 and Margin of Safety of both the period from the following:

<i>Year</i>	<i>Sales</i>	<i>Profit</i>
2006	10,000	2000
2007	15,000	4000

12. Calculate Break-even Sales in value and Margin of Safety from the following details:

Variable Cost	₹ 6,00,000
Fixed Cost	₹ 3,00,000
Profits	₹ 1,00,000
Sales	₹ 10,00,000

13. Years      Sales (₹)      Profits (₹)
- |      |          |        |
|------|----------|--------|
| 2006 | 1,50,000 | 20,000 |
| 2007 | 1,70,000 | 25,000 |

Calculate:

- P/V ratio and Fixed Cost
  - Sales to get required profit of ₹ 40,000
  - Margin of Safety at profit ₹ 2,50,000
  - Profit when sales is ₹ 1,00,000
14. Revenue is ₹ 5,00,000, Fixed Cost ₹ 3,00,000 and Net Income ₹ 3,00,000. If the selling price per unit is ₹ 50 and variable cost is 40%, calculate the B.E.P.
15. The management is considering the installation of a new machinery which will increase output to a maximum of 3000 units per week. The selling price per unit will remain unchanged, variable cost per unit will be lower but weekly fixed cost will be greater. Net profit at maximum will be ₹ 500. The new break-even point will be at 1750 units.
- Prepare two graphs illustrating present and proposed operations from zero to maximum output indicating each the respective margin of safety.
16. A restaurant sales vary from 4000 to 5000 covers per month. The fixed cost of the restaurant is ₹ 8000 and it operates at a food cost of ₹ 35%. Average spending power of the restaurant is ₹ 5.
- You are required to find out the break-even sales, break-even quantity of covers of the restaurant.
17. Sales units 10,000 @ ₹ 20 per unit, variable cost ₹ 10 per unit, fixed cost ₹ 80,000. Find out B.E.P. in units and sales and also profit. What should be the sales for earning a profit of ₹ 60,000?
18. Sales 6000 units at ₹ 15 per unit, variable cost ₹ 10 per unit, fixed cost ₹ 80,000. Find out B.E.P. in units, sales and also profit. What should be the sales to earn a profit of ₹ 40,000?
19. From the following, calculate B.E.P. Fixed cost ₹ 1,50,000, Variable cost ₹ 10 per unit, Selling price per unit ₹ 15 per unit.

20. Calculate the B.E.P. from the following selling price per unit ₹ 20, variable cost per unit ₹ 15, fixed cost ₹ 2,00,000.
21. Find out the amount of profit earned during the year using marginal cost equation. Fixed cost ₹ 5,00,000, variable cost ₹ 10 per unit, selling price ₹ 15 per unit. Output level 1,50,000 units.
22. From the following data, calculate:
- (a) B.E.P. in amounts (Sales)
  - (b) No. of units that must be sold to earn a profit ₹ 60,000
- Sales price ₹ 20 per unit, Variable cost ₹ 11 per unit, Variable Selling cost ₹ 3 per unit, Fixed Factory O.H. ₹ 5,40,000, Fixed Selling cost ₹ 2,52,000.
23. For the years 2008 and 2009, Labour cost ₹ 4,10,000, Direct Material ₹ 1,50,000, Fixed O.H. ₹ 1,20,000, Variable O.H. ₹ 2,00,000, Sales ₹ 10,00,000. Calculate the profit and B.E.P. in units.
- (a) Effect on BEP if increased 10% on Fixed Cost and Variable Cost.
  - (b) Effect on BEP, if decreased 10% on Fixed Cost and Variable Cost.

# 6

## Chapter

# Budgets

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of budgets
- Budgeting for food operations and objectives and advantages of budgeting
- Types of budgets
- Budgeting in hotel industry
- Meaning, definition and objectives of budgetary control and steps in budgetary control
- Budgetary control procedure in hotels and advantages and limitations of budgetary control

### MEANING AND DEFINITION OF BUDGET

If planning, coordination and control are the wheels of the business vehicle, budget is the steering wheel which directs it towards the specified destination. In the absence of a well-knit budgetary control system, no management can function effectively. So, budgeting has become “part and parcel” of the modern business world.

A budget is a policy expression of business in monetary terms underlining business operation for a particular trading period, e.g. cash budget, sales budget, labour cost budget, budgeted profit and loss account.

The Institute of Cost and Management Accountants (England) defines a budget as “a financial and or quantitative statement, prepared and approved prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.”

An analysis of the above definition brings out the following points:

- (a) A budget is a monetary and/or quantitative statement.
- (b) It is prepared for a definite future period.
- (c) It is prepared prior to a defined period of time.
- (d) The policies and objectives are determined in advance.

## BUDGETING FOR FOOD OPERATIONS

The results of previous trading cannot be taken as a guideline to compare with future period due to the following reasons:

- 1. The degree of competition may vary from one year to another.
- 2. The local conditions may change.
- 3. The general economic situation may change.
- 4. The fiscal policy of the government controls the spending power.

Therefore, the results can give a general guideline for future operations. Thus, it is advisable to plan each year's operations separately and compare actual results to budgeted results.

Budgeting in hotel and catering establishments involves the planning process by means of which budgets are prepared for the business as well as the various departments of the hotel.

Budgeting is a planning process by which targets of income and expenditure are set for each department separately. Therefore, budget indicates future plan of operation as related to a fixed period.

## OBJECTIVES OF BUDGETING

- (i) To give practical expression to the aims and policies of the business.
- (ii) To provide a detailed plan of food and beverage operation in respect of a particular trading period.
- (iii) To ensure better coordination of various departments/sections/functions.
- (iv) To set standards/targets against which it is possible to measure managerial performance.
- (v) To ensure an economical use of the sources of the business.
- (vi) To state business expectation (goals) in clear and formal terms and to facilitate their attainability.
- (vii) To communicate expectation to all concerned with the management of the business so that they understood, supported, and implemented.
- (viii) To coordinate the activities and efforts in such a way that the use of resources is maximized.
- (ix) To provide a means of measuring and controlling the performance of individual, and departments and to supply information on the basis of which the necessary corrective action can be taken.



## ADVANTAGES OF BUDGETING

- (i) It helps in regulating the progress of the food and beverage business.
- (ii) It gives a direction to business.
- (iii) It compels management to plan.
- (iv) It provides an overall picture of the results expected from a proposed plan of operation.
- (v) It sets standards of performances which can be measured and assessed.
- (vi) It serves as a guide to the various executives and establishes line of responsibility and coordinates all activities.
- (vii) It ensures possible use of resources and helps maximize profit.
- (viii) It controls expenditure and promotes costs consciousness and cost responsibility within the departments/sections.
- (ix) It provides a basis on which to compare subsequent performance.
- (x) It encourages communication and team work between different parts of the organization.
- (xi) It sets targets for the various executives.

## TYPES OF BUDGETS

Budgets are classified on different bases like capacity, coverage, period, etc.

- On the basis of **capacity**, there are **fixed budgets** and **flexible budgets**.
- On the basis of **period**, there are **short-term**, **medium-term** and **long-term budgets**.
- On the basis of **coverage**, there are **functional budgets** and **master budget**.

### Functional Budgets

A functional budget is one which relates to a specific function of the business. The Terminology of Cost Accountancy defines it as “a budget of income or expenditure appropriate to, or the responsibility of a particular function.” Separate budgets are prepared for each function of the business and they become subsidiary to the master budget. The number of functional budgets depends on the size and nature of the business. However, the following budgets are usually prepared:

#### **Sales Budget**

It is the foundation on which all other budgets are built up. It is a forecast of the quantities and values of sales to be achieved in a budget period. The preparation of sales budget is the responsibility of the sales manager, who is assisted by accountant and budget officer. Sales budget is usually prepared after conducting an analysis of:

- (a) Past sales
- (b) Present market conditions
- (c) Reports of salesman
- (d) General trade and business conditions
- (e) Special business conditions, if any.

In the case of a hotel, the following points are to be taken into account in sales forecasting:

- Past sales
- Sales mix
- Advance booking
- Market studies
- Capacity
- Pricing policy
- Sales promotion
- Seasonal variation
- Forthcoming events
- Economic considerations

Figure 6.1 Shows the format of a monthly sales budget.

XYZ HOTEL LTD.						
To: Managing Director			From: F&B Controller			
Department	No. of Covers	Food Sales		Beverage Sales		Total Sales
Indian Restaurant						
Chinese Restaurant						
Italian Restaurant						
Coffee Shop						
Total						

**Figure 6.1** *Format of a Monthly Sales Budget*

### ***Selling and Distribution Cost Budget***

Selling and distribution costs are policy costs and are based on various factors such as nature of the product, extent of competition, expected increase in sales, etc. Since these expenses are directly related to sales, this budget is also prepared by the sales manager with the assistance of budget officer, accountant, etc.

### ***Production Budget***

It is the budget prepared by the production manager, after consulting with the budget officer (Fig. 6.2). It lays down the targeted volume of output to be produced in a given period, based on the supply conditions of materials, labour, plant capacity, etc.

**XYZ HOTELS LTD.  
PRODUCTION BUDGET**

	Months				
	Jan.	Feb.	March	April	May
Estimated Sales of Product	—	—	—	—	—
Add:					
Desired Closing Inventory	xx				
Less:					
Opening Inventory					

**Figure 6.2** *Format of Production Budget*

### ***Production Cost Budget***

It is prepared by the production manager, after fixing the budgeted production. It shows the estimated cost of production. It shows the estimated cost of producing the quantity of products as specified in the production budget.

### ***Purchase Budget***

Purchase budget or materials budget is prepared to show the quantities and costs of materials, spare parts, components, etc. Production requirements and stock levels are also given due consideration while fixing this budget. In the case of a hotel, while developing the purchase budget, the following points need to be analysed:

- The changes in the sales-mix and their effect on the purchase budget
- The use of convenience and pre-packed commodities and fast food items and their effect on the cost of purchases
- Changes in the supplier and its effect on cost
- Constant surveillances on prices

### ***Personal Budget***

It is the budget prepared by the personnel development forecasting the requirements of different categories of labour for the various production and service departments. In this budget, labour requirements will be expressed in terms of money, number, grades of labour, number of working hours, etc.

### ***Plant Utilization Budget***

This budget shows the requirements of plant and machinery so as to achieve the production targets as laid down in the production budget. The plant capacity is usually expressed in terms of suitable units like working hours, weight or number of products, etc. Since the budgeted capacity utilization is a specific field, it helps in controlling over-work of machines.

### ***Capital Expenditure Budget***

It shows the estimated expenditure on fixed assets during the budget period. Usually, this budget is based on long-term forecast covering a period of 5–10 years or more. This budget is prepared by the cost accountant with the assistance of plant engineer.

### ***Administration Cost Budget***

Administration costs normally form a greater part of the total costs. Hence, the preparation of budget for the purpose of controlling such costs is highly essential. Administration costs generally include the cost of formulating the policy, direction of the organization, and controlling operation, etc.

### ***Research and Development Budget***

Inventions and innovations are the symbols of modern business. No business can thrive unless it keeps pace with the changing conditions. So, funds are usually kept apart for research and development purposes. Research and development anticipates the costs likely to be incurred on research during a budget period.

### ***Cash Budget***

Liquidity occupies a prominent place in the case of all business units. Deficiency of cash, at any time, may bring about a collapse of the whole edifice of business. Hence, receipts and payments of cash are forecasted in advance so that deficiency of cash can be provided for, easily. For this purpose, a cash budget is prepared. It is based on various factors such as cash credit sales, cash and credit purchases, overheads, wages, capital expenditure, etc. The main objective of a cash budget is to establish whether at the end of each period there will be “deficit” or “surplus” of cash. The cash budget has the following advantages:

- (i) It provides cash profile of the hotel for the period which is useful for the management for the purpose of:
  - (a) determining future cash needs
  - (b) planning for financing these needs
  - (c) controlling cash and liquidity of the enterprise
  - (d) formulating a suitable dividend policy
- (ii) It reveals any surplus of cash so that surplus cash may be invested properly or loaned for a short period.
- (iii) It is a means to identify situations requiring immediate investments of surplus of cash resources to increase the income of the business.
- (iv) It ensures that sufficient cash is available when required.
- (v) It shows any expected shortage of cash, so that action may be taken, e.g. a bank overdraft or loan may be arranged.
- (vi) It shows the availability of cash so that advantage may be taken for cash discounts.

(Preparation of Cash Budget is discussed in detail under Cash Management)

## **Master Budget**

Master budget is a consolidated summary of functional budgets. ICMA (London) has defined it as “the summary budget incorporating its component of functional budgets and which is finally approved, adopted and employed.” The master budget summarizes the functional budgets so as to produce Budgeted Profit & Loss Account and Balance Sheet.

## **Fixed Budget**

Fixed budget can be defined as a budget prepared for a given level of activity. It does not take into consideration changes in the level of activity. Since it is silent about changes in costs, it has great practical utility under present conditions.

## **Flexible Budget**

Flexible budget takes into account every change in costs due to a change in the level of activity. It is prepared after making careful classification of all costs into fixed, variable and semi-variable components. The success of this budget depends on the accuracy of classification of costs into fixed, variable and semi-variable. For example, labour cost budget in a resort hotel.

A seasonal restaurant may have a fixed budget for maintenance and office expenses and flexible budget for the cost of sales, labour cost.

## **Performance Budgeting**

Performance budgeting is system where budgets are established in such a way so that each item of expenditure is related to a specific responsibility centre and is closely linked with the performance of that standard. Developing work programmes and performance expectations by assigned responsibility is the main issue involved in fixation of performance budgets and is necessary for the achievement of the goals and objectives of the enterprise.

## **Zero-base Budgeting**

Zero Base Budgeting (ZBB) came into force in the early 1970s in the USA, as a means of controlling the state expenditure. Under zero base budgeting, unlike the normal budgeting, the previous year's figures are not taken into account as the base for the development. Zero base budgeting is not based on the incremental approach, and previous year's figures are not adopted as a base. Rather, zero is taken as the base as the name goes. Zero base budgeting has been defined by its originator Peter A Pyher as follows:

“A planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch (hence zero base) and shifts the burden of proof to each manager to justify why he should spend any money at all. The approach requires that all activities be analyzed in ‘decision packages’ which are evaluated by systematic analysis and ranked in order of importance.”

## **Advantages of Zero-base Budgeting**

- (a) It promotes operational efficiency because it requires managers to review and justify their activities or the funds.

- (b) It is most appropriate for the staff and support areas (non-manufacturing overheads) of an organization because the outputs of these areas are not directly related to the final outputs of the organization.
- (c) It considers every time alternative ways of performing the same job because zero is taken as a base every time a budget is prepared.
- (d) It focuses management process on the analysis and decision making because it requires managers to review their activities every time a budget is developed.
- (e) It is helpful to the management in making optimum allocation of scarce resource because a unique aspect of zero base budgeting is the evaluation of both current and proposed expenditure and placing it in some order of priority.

## BUDGETING IN HOTEL INDUSTRY

Budgeting in a food and beverage operation involves the planning process by means of which budgets are prepared for the business as well as the various departments. It is illustrated in Fig. 6.3.

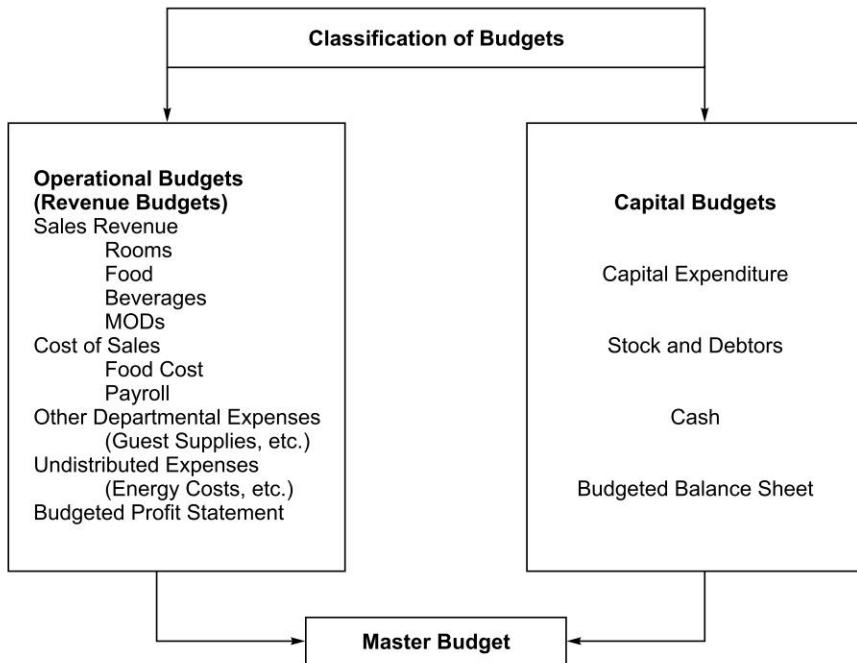


Figure 6.3 Budgeting

## BUDGETARY CONTROL

The technique of exercising control through budget is termed *budgetary control*. The Institute of Cost and Management Accountants (England) has defined budgetary control as “the establishment of budgets relating the responsibility of executives to the requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action, the objectives of that policy or to provide a firm basis for its revision.”

## Objectives of Budgetary Control

- (a) To aid the management in planning and formation of future policies
- (b) To assist the management in developing proper coordination among various sections of the organization
- (c) To help the management in controlling costs and other activities.

## Steps in Budgetary Control

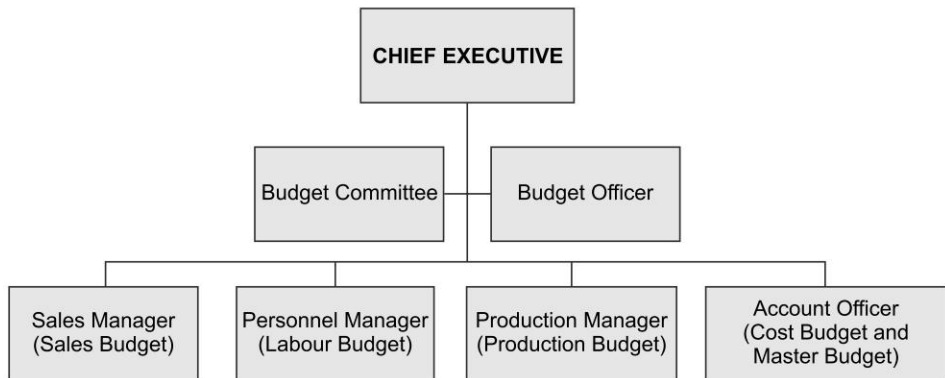
The following steps must be considered while introducing a budgetary control system:

### ***Establishment of Budget Centres***

Budget centre is usually a section of the organization. For the successful implementation of budgets, budget centres must be established and the responsibility for each budget centre must be assigned to persons in charge of such budget centre.

### ***Preparation of an Organization Chart***

Before installation of budgetary system, it is of prime importance that authority and responsibility of each executive must be clearly defined. If it is not done, conflicts may arise in the course of its operation. Moreover, in the event of a failure of operation or bad performance, each executive will try to shirk his responsibility. For this purpose, an organization chart is usually prepared, the general form of which is shown in Fig. 6.4.



**Figure 6.4** *An Organization Chart*

### ***Preparation of Budget Manual***

Budget manual is a document which contains numerous instructions regarding the preparation of budgets, their implementation, etc. Generally, it is a guide to the executive in implementing the scheme of budgetary control successfully.

### ***Appointment of Budget Officer***

The chief executive should appoint a budget officer/controller, who will assist him in administering the budget. His rank should be similar to that of the functional managers. Since he is expected to

do figure works, he should have an expert knowledge of accounting. It is his duty to see that the actual performance goes in line with the budgeted performance so that corrective action can be taken in time.

### ***Formation of Budget Committee***

The budget committee is expected to assist the budget officer/controller in formulating and implementing the budgets. This committee is comprised of the general manager/chief executive, budget officer and various functional executives such as production manager, sales manager, and personnel manager. In the case of a hotel, the budget committee comprises:

- (i) Managing Director/General Manager/Chairman
- (ii) Food and Beverage Controller
- (iii) Food and Beverage Manager
- (iv) Executive Chef
- (v) Executive House Keeper
- (vi) Banquet Manager
- (vii) Chief Accounts Officer
- (viii) Controller–Secretary

### ***Determination of the Budget Period***

Budget period is the length of time for which a budget is to be prepared and employed. ICMA (England) defines budget period as “the period for which a budget is prepared and employed.” No hard and fast rule can be laid down as regards the length of the budget period. It depends on factors such as nature of business, need for control of operations, length of trade cycle, production cycle, functional area covered by the budget, time interval necessary for financing production and the accounting period adopted by the concern.

### ***Determination of the Key Factor***

As regards every business, there is a constraint or limitation on production or sales potential. This constraint or limitation is known as *key factor* or *limiting factor*. The key factor differs from concern to concern. In some concerns, it may be low sales potentiality or shortage of plant capacity; whereas in some others it may be the deficiency of capital, labour, or raw material. Since the key factor is the decisive factor, it must be given due weightage while preparing budgets. In the case of hotel industry, the following are some of the limiting or key factors:

- (a) Accommodation available
- (b) Seating capacity
- (c) Management policy
- (d) Insufficient capital and labour
- (f) Special function capacity
- (g) Consumers’ demand
- (h) Availability of raw material

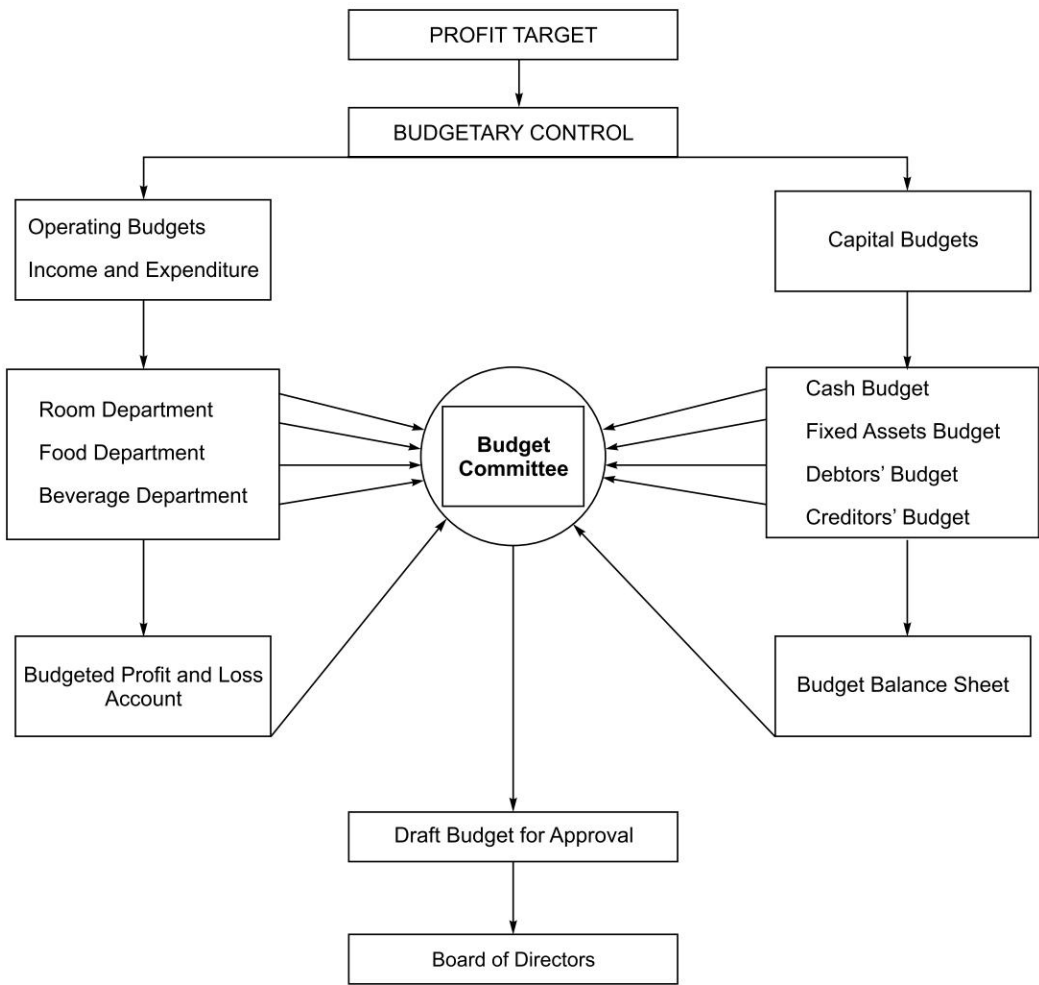


**Determination of Level of Activity**

While preparing the budgets, it is necessary to establish normal levels of activity. If the level of activity fixed is too high, it may turn out to be unattainable, resulting in worsening the labour management relations. On the contrary, if the level is set very low, it will, in the long run, mitigate the efficiency of workers. Hence, the level of activity must be fixed logically on the basis of the following:

- (a) Past performance
- (b) Present level of efficiency
- (c) Possible future increase in the level of efficiency

Figure 6.5 shows budgetary control procedure in hotel.



**Figure 6.5** Budgetary Control Procedure in Hotels

## Advantages of Budgetary Control

1. It establishes clear lines of responsibility and coordinates all activities of the department.
2. It controls expenditure and promotes cost-consciousness and cost responsibility within the department.
3. It helps to ensure that objectives as detailed in the budget are achieved.
4. It ensures an economic use of the resources and helps maximize profits.
5. It enables standardization of products, processes and operations.
6. It eliminates wastages.
7. It points out operational inefficiency by fixing targets for each section or unit of the organization.
8. It facilitates the introduction of standard costing system.
9. It provides a basis for the introduction of incentive systems of wage payment.
10. Management by exception is made possible, since comparison of actual and budgeted performance will show up the weak spots.

## Limitations of Budgetary Control

Although budgetary control is an important tool in the hands of management, it is not cent percent perfect and pure. The main limitations of the technique are mentioned below:

1. **Budgets are based on estimates:** Hence, it may not always be very accurate.
2. **Budgets may sometimes be rigid:** Budgets are usually for a specified period and are expressed in terms of quantity and money value. Hence, there is every chance of it becoming rigid.
3. **Lack of cooperation:** Most often, the functional managers may not be in conformity with the top management. In the absence of their full cooperation, the whole system will become a nullity.
4. **It is an expensive tool:** Budgetary control system necessitates the employment of specialized staff and this involves huge amount of expenditure which small concerns cannot afford easily.

## ILLUSTRATIONS

1. Abba Ltd. plans to sell 54,000 units of a certain product in the first calendar quarter; 60,000 units in the second quarter; 66,000 units in the third quarter and 78,000 units in the fourth quarter; and 66,000 units in the first quarter of the following year.

At the beginning of the first quarter of the current year, there are 9000 units of the product in stock. At the end of each quarter, the company plans to have an inventory equal to 1/6th of the sales for the next quarter.

How many units must be manufactured in each quarter of the current year?

**Solution:**

<b>Production Budget</b>				
	<i>I Qtr (units)</i>	<i>II Qtr (units)</i>	<i>III Qtr (units)</i>	<i>IV Qtr (units)</i>
Sales	54,000	60,000	66,000	78,000
Add: Closing Stock	10,000	11,000	13,000	11,000
Total	64,000	71,000	79,000	89,000
Less: Opening Stock	9000	10,000	11,000	13,000
<b>Production</b>	<b>55,000</b>	<b>61,000</b>	<b>68,000</b>	<b>76,000</b>

2. From the following data, prepare a production budget for the Aarman Restaurant Ltd.  
Stocks for the budget period:

Product	1.1.2000	31.1.2000
P	16,000	20,000
Q	18,000	16,000
R	24,000	28,000

Sales Programme:

P	–12,0000 units
Q	–10,0000 units
R	–16,0000 units

Normal loss in production:

P	4%
Q	2%
R	6%

**Solution:**

<b>Production Budget</b>				
	<i>P</i>	<i>Q</i>	<i>R</i>	<i>Total</i>
Sales	1,20,000	1,00,000	1,60,000	3,80,000
Add: Closing Stock	20,000	16,000	28,000	64,000
Total	1,40,000	1,16,000	1,88,000	4,44,000
Less: Opening Stock	16,000	18,000	24,000	58,000
Net Production	1,24,000	98,000	1,64,000	3,86,000
Add: Loss in Production (B/f)	5200	2000	10,500	17,700
<b>Actual Production</b>	<b>1,29,200</b>	<b>1,00,000</b>	<b>1,74,500</b>	<b>4,03,700</b>

**Working Notes:**

Net production:

$$P = 1,24,000 \text{ (i.e. Actual production – Normal loss)}$$

$$100 - 4 = 96\% = 1,24,000$$

$$\text{Actual production} = \frac{1,24,000 \times 100}{96}$$

$$= \mathbf{1,29,168 \text{ units (Approx. 1,29,200 units)}}$$

$$Q = 98,000 \text{ units}$$

$$100 - 2\% = 98\%$$

$$\text{Actual production} = \frac{98,000 \times 100}{98}$$

$$= \mathbf{1,00,000 \text{ units}}$$

$$R = 1,64,000 \text{ units}$$

$$100 - 6\% = 94\%$$

$$\text{Actual production} = \frac{1,64,000 \times 100}{94}$$

$$= \mathbf{1,74,470 \text{ units (Approx. 1,74,500 units)}}$$

3. The expenses budgeted for the production of 10,000 units in a factory are furnished below:

	Per Unit (₹)
Materials	70
Labour	25
Variable overheads	20
Fixed overheads (₹ 1,00,000)	10
Variable expenses (Direct)	5
Selling expenses (10% Fixed)	13
Distribution expenses (20% Fixed)	7
Administrative expenses (₹ 50,000)	5
Total cost per units	155

Prepare a budget for the production of (a) 8000 units, and (b) 6000 units.

Assume the administrative expenses are rigid for all levels of production.

**Solution:****Flexible Budget**

Elements of Cost	6000 units	8000 units	10,000 units
Direct Materials @ ₹ 70	4,20,000	5,60,000	7,00,000
Direct Wages @ ₹ 25	1,50,000	2,00,000	2,50,000

*Contd.*

Variable Overheads @ ₹ 20	1,20,000	1,60,000	2,00,000
Fixed overheads	1,00,000	1,00,000	1,00,000
Variable Expenses @ ₹ 5	30,000	40,000	50,000
<b>Selling Expenses:</b>			
Fixed	13,000	13,000	13,000
Variable @ ₹ 11.70	70,200	93,600	1,17,000
<b>Distribution Expenses</b>			
Fixed	14,000	14,000	14,000
Variable @ ₹ 5.60	33,600	44,800	56,000
Administrative Expenses	50,000	50,000	50,000
<b>Cost of Sales</b>	<b>10,00,800</b>	<b>12,75,400</b>	<b>15,50,000</b>

**Working Notes:**

(1) Selling Expenses:

$$\text{Fixed} = \frac{13 \times 10}{100} = ₹ 1.30 \text{ per unit}$$

$$\text{Total} = 1.30 \times 10,000 = ₹ 13,000$$

$$\text{Variable} = 13 - 1.30 = ₹ 11.70 \text{ per unit}$$

(2) Distribution Expenses:

$$\text{Fixed} = \frac{7 \times 20}{100} = ₹ 1.40 \text{ per unit}$$

$$\text{Total} = 1.40 \times 10,000 = ₹ 14,000$$

$$\text{Variable} = 7 - 1.40 = ₹ 5.60 \text{ per unit}$$

4. The expenses of producing 1800 units in a factory with a capacity to produce 2400 units are given below:

Material      ₹ 4 per unit

Labour        ₹ 3 per unit

Factory Expenses:

Fixed         ₹ 720

Variable      ₹ 900

Variable Selling Expenses    ₹ 450

Office and Administrative Expenses ₹ 1800 (fixed)

What will be the cost of production per unit if the actual output and the normal capacity are taken into consideration?

**Solution:****Flexible Budget**

<i>Elements of Cost</i>	<i>1800 units</i>		<i>2400 units</i>	
	<i>Total</i>	<i>Per unit</i>	<i>Total</i>	<i>Per unit</i>
Materials	7200	4.00	9600	4.00
Labour	5400	3.00	7200	3.00
Factory Expenses				
Fixed	720	0.40	720	0.30
Variable	900	0.50	1200	0.50
Variable Selling Expenses	450	0.25	600	0.25
Administrative Expenses	1800	1.00	1800	0.75
<b>Cost of Sales</b>	<b>16,470</b>	<b>9.15</b>	<b>21,120</b>	<b>8.80</b>

**Working Notes:**

(1) Materials:

(a)  $1800 \times 4 = ₹ 7200$

(b)  $2400 \times 4 = ₹ 9600$

(2) Labour:

(a)  $1800 \times 3 = ₹ 5400$

(b)  $2400 \times 3 = ₹ 7200$

(3) Variable factory overhead:

(a)  $1800 \times 0.50 = ₹ 900$

(b)  $2400 \times 0.50 = ₹ 1200$

(4) Variable selling expense;

Per unit =  $450/1800 = ₹ 0.25$

(a)  $1800 \times 0.25 = ₹ 450$

(b)  $2400 \times 0.25 = ₹ 600$

(5) Fixed overheads will remain the same. That will not change irrespective of the units produced.

5. Prepare a flexible budget for overheads on the basis of data given below. Ascertain overhead rates at 50 percent and 70 percent capacity.

## At 60% Capacity (₹)

## Variable Overheads:

Indirect Material 6000

Indirect Labour 18,000

## Semi-Variable overheads:

Electricity (40% fixed) 30,000

Repairs and Maintenance (20% variable) 3000

## Fixed overhead:

Depreciation 16,500

Insurance 4500

Salaries 15,000

**Total Overheads 93,000**

Estimated direct labour hours 1,86,000 hrs

**Solution:****Flexible Budget**

<i>Elements of Cost</i>	<i>50% Capacity</i>	<i>60% Capacity</i>	<i>70% Capacity</i>
Variable Overheads	₹	₹	₹
Indirect Material	5000	6000	7000
Indirect Labour	15,000	18,000	21,000
Semi Variable overheads			
Electricity	27,000*	30,000	33,000*
Repairs and Maintenance	2900#	3000	3100#
Fixed overheads			
Depreciation	16,500	16,500	16,500
Insurance	4500	4500	4500
Salaries	15,000	15,000	15,000
Total Overheads	85,000	93,000	1,10,100
Estimated direct labour hours	1,55,000	1,86,000	2,17,100
<b>Overhead rate</b>	<b>₹ 0.55</b>	<b>₹ 0.50</b>	<b>₹ 0.46</b>

**Working Notes:**

\* **Electricity:** At 60%, electricity cost is ₹ 30,000 of which ₹ 12,000 (i.e. 40% of ₹ 30,000) is fixed and ₹ 18,000 variable. The variable portion of the electricity cost is ₹ 15,000 (i.e.  $18,000/60 \times 50$ ) at 50% capacity and ₹ 21,000 (i.e.  $18,000/60 \times 70$ ) at 70% should be added to get the electricity cost.

**# Repairs and Maintenance:** At 60% capacity, repairs and maintenance cost is ₹ 3000 of which ₹ 2400 (i.e. 80% of ₹ 3000) is fixed and ₹ 600 (i.e. 20% of ₹ 3000) is variable. The variable portion of at 50% is ₹ 500 (i.e.  $600/60 \times 50$ ) and ₹ 700 (i.e.  $600/60 \times 70$ ) at 70% capacity. To this variable, the fixed portion of ₹ 2400 should be added to obtain the repairs and maintenance cost. Thus, total cost of repairs and maintenance comes to ₹ 2900 (i.e. ₹ 500 + ₹ 2400) at 50% and ₹ 3100 (₹ 700 + 2400) at 70%.

6. The following data are available in a company for a yearly period:

	₹ (lakhs)
Fixed Expenses	
Wages and Salaries	9.5
Rent, Rates, and taxes	6.6
Depreciation	7.4
Sundry Administrative expenses	6.5
Semi-variable expenses (at 50% capacity)	
Maintenance and Repairs	3.5
Indirect Labour	7.9
Sales department salaries, etc.	3.8
Sundry administrative expenses	2.8
Variable expenses (at 50% capacity)	
Materials	21.7
Labour	20.4
Other expenses	7.9

Assume that the fixed expenses remain constant for all levels of production, semi-variable expenses remain constant between 45% and 65% of capacity, increasing by 10% between 65% and 80% capacity and by 20% between 80% and 100% capacity.

Sales at various levels are:

	₹ (lakhs)
50% capacity	100
60% capacity	120
75% capacity	150
90% capacity	180
100% capacity	200

Prepare a flexible budget for the year and forecast the profits at 60%, 75%, 90%, and 100% of capacity.



**Solution:****Flexible Budget**

	50% Capacity (₹ in lakhs)	60% Capacity (₹ in lakhs)	75% Capacity (₹ in lakhs)	90% Capacity (₹ in lakhs)	100% Capacity (₹ in lakhs)
Variable Expenses					
Materials	21.70	26.04	32.55	39.06	43.40
Labour	20.40	24.48	30.60	36.72	40.80
Other Expenses	7.90	9.48	11.85	14.22	15.80
Semi-Variable Expenses					
Maintenance and Repairs	3.50	3.50	3.85	4.20	4.20
Indirect Labour	7.90	7.90	8.69	9.48	9.48
Sales Department Salaries, etc.	3.80	3.80	4.18	4.56	4.56
Sundry Maintenance Exp.	2.80	2.80	3.08	3.36	3.36
Fixed Expenses					
Wages and Salaries	9.50	9.50	9.50	9.50	9.50
Rent, Rates and Taxes	6.60	6.60	6.60	6.60	6.60
Depreciation	7.40	7.40	7.40	7.40	7.40
Sundry Admin. Exp.	6.50	6.50	6.50	6.50	6.50
<b>Total Estimated Cost</b>	<b>98.00</b>	<b>108.00</b>	<b>124.80</b>	<b>141.60</b>	<b>151.60</b>
Estimated Profit	2.00	12.00	25.20	38.40	48.40
<b>Sales</b>	<b>100.00</b>	<b>120.00</b>	<b>150.00</b>	<b>180.00</b>	<b>200.00</b>

7. The cost of an article at a capacity level of 5000 units is given under A below. For a variation of 25% in capacity above or below this level, the individual items vary as indicated under B below.

	A ₹	B
Material Cost	25,000	(100% varying)
Labour Cost	15,000	(100% varying)
Power	1250	(80% varying)
Repairs and Maintenance	2000	(75% varying)
Stores	1000	(100% varying)
Inspection	500	(20% varying)
Depreciation	10,000	(100% varying)
Administration Overheads	5000	(25% varying)
Selling Overheads	3000	(25% varying)
Cost per unit ₹ 12.55		

Find the unit cost of the product at production levels of 4000 units and 6000 units.

**Solution:****Flexible Budget**

<i>Elements of Cost</i>	<i>4000 units</i>		<i>5000 units</i>		<i>6000 units</i>	
	<i>Total</i>	<i>Per unit</i>	<i>Total</i>	<i>Per unit</i>	<i>Total</i>	<i>Per unit</i>
Material Cost (100% varying)	20,000	5.00	25,000	5.00	30,000	5.00
Labour Cost (100% varying)	12,000	3.00	15,000	3.00	18,000	3.00
Power						
Fixed	250	0.0625	250	0.05	250	0.042
Variable (80% varying)	800	0.20	1000	0.20	1200	0.20
Repairs and Maintenance						
Fixed	500	0.125	500	0.10	500	0.083
Variable (75% varying)	1200	0.30	1500	0.30	1800	0.30
Stores (100% varying)	800	0.20	1000	0.20	1200	0.20
Inspection						
Fixed	400	0.10	400	0.08	400	0.067
Variable (20% varying)	80	0.02	100	0.02	120	0.02
Depreciation (100% varying)	8000	2	10,000	2	12,000	2
Administrative overheads						
Fixed	3750	0.9375	3750	0.75	3750	0.625
Variable (25% varying)	1000	0.25	1250	0.25	1500	0.25
Selling overheads						
Fixed	2250	0.5625	2250	0.45	2250	0.375
Variable (25% varying)	600	0.15	750	0.15	900	0.15
	<b>51,630</b>	<b>12.9075</b>	<b>62,750</b>	<b>12.55</b>	<b>73,870</b>	<b>12.312</b>

8. East and West enterprises are currently working at 50% capacity and produce 10,000 units. Estimate the profits of the company when it works at 60% and 70% capacity.

At 60% capacity, the raw material cost increases by 2% and the selling price falls by 3%.

At 70% capacity, the raw materials cost increases by 4% and the selling price falls by 5%.

At 50% capacity, the product costs ₹ 180 per unit and is sold at ₹ 200 per unit.

The unit cost of ₹ 180 is made up as follows:

Material	₹ 100
Wages	₹ 30
Factory overhead	₹ 20 (40% fixed)
Administrative overhead	₹ 30 (50% fixed)

**Solution:**

<i>Elements of Cost</i>	<i>50%-10,000 units</i>		<i>60%-12,000 units</i>		<i>70%-14,000 units</i>	
	<i>Total</i>	<i>Per unit</i>	<i>Total</i>	<i>Per unit</i>	<i>Total</i>	<i>Per unit</i>
Material	1,00,0000	100	12,24,000	102	14,56,000	104
Wages	3,00,000	30	3,60,000	30	4,20,000	30
Factory Overhead						
Fixed (40%)	80,000	8.00	80,000	6.67	80,000	5.71
Varying	1,20,000	12.00	1,44,000	12.00	1,68,000	12.00
Administrative Overhead						
Fixed (50%)	1,50,000	15	1,50,000	12.50	1,50,000	10.71
Varying	1,50,000	15	1,80,000	15.00	2,10,000	15.00
Total Cost	18,00,000	180	21,38,040	178.17	24,83,880	177.42
<b>Profit</b>	<b>2,00,000</b>	20	<b>2,25,960</b>	18.83	<b>2,46,120</b>	17.58
Selling Price	20,00,000	200	23,64,000	197.00	27,30,000	195.00

9. The following overhead expenses relate to a cost centre operating at 50% of normal activity. Draw up a flexible budget for the cost centre for operating 75%, 100% and 125% capacity. Indicate the basis upon which you have estimated each item of expenses for the different operating levels:

	₹
Supervisor	60
Asst. Supervisor	40
Inspectors	65
Shop labourers	40
Repairs	100
Defective work	25
Consumable stores	20
Overtime bonus	Nil
Depreciation	110

**Solution:****Flexible Budget**

	<i>50% capacity</i> (₹)	<i>75% capacity</i> (₹)	<i>100% capacity</i> (₹)	<i>125% capacity</i> (₹)
Supervisor	60	90	120	150

Contd.

Assistant Supervisor	40	60	80	100
Inspectors	65	97.50	130	162.50
Shop Labourers	40	60	80	100
Machinery Repairs	100	150	200	250
Defective Work	25	37.50	50	62.5
Consumable	20	30	40	50
Overtime bonus	—	—	—	—
Machine Depreciation	110	165	220	275
<b>Total</b>	<b>460</b>	<b>690</b>	<b>920</b>	<b>1150</b>

### Objective Type Questions

Fill in the blanks:

- A \_\_\_\_\_ is a financial and or quantitative statement, prepared and approved prior to a defined period of time.
- \_\_\_\_\_ budget shows the estimated expenditure on fixed assets during the budget period.
- \_\_\_\_\_ budget is a consolidated summary of functional budgets.
- A \_\_\_\_\_ budget does not take into consideration, changes in the level of activity.
- In \_\_\_\_\_ budgeting previous year's figures are not adopted as a base.

### Review Questions

- Define a budget.
- What is meant by budgetary control?
- What is meant by 'key factor'?
- What are the objectives of a budget?
- What are the advantages of budgeting?
- Explain the different types of functional budgets.
- What is meant by:
  - ZBB
  - Performance based budgeting
  - Master budget
- Distinguish between fixed budget and flexible budget.
- Write a note on budgeting in the hotel industry?
- Write a short essay on the purpose and advantages of budgeting.
- What are the objectives of budgetary control?
- Explain the steps in the budgetary control?

13. What are the advantages of budgetary control?
14. What are the limitations of budgetary control?

### Exercises

1. The cost of a product at capacity level of 5000 units are given below. Prepare Flexible Budget for 4000 units and 6000 units levels.

Material cost	₹ 2,5000 (100% varying)
Labour cost	₹ 15,000 (100% varying)
Power	₹ 1250 (80% varying)
Repairs and maintenance	₹ 2000 (75% varying)
Stores	₹ 1000 (100% varying)
Inspection	₹ 500 (20% varying)
Depreciation	₹ 10,000 (100% fixed)
Administrative overheads	₹ 5000 (25% varying)
Selling overheads	₹ 3000 (50% varying)

Draw a flexible budget from the following information, the overhead rate @ 70%, 85% and 95% capacity.

<i>Particulars</i>	<i>85% Capacity</i>
<b>Variable Expenses:</b>	
Materials	6000
Labour	10,000
Salesman Commission	5000
<b>Semi-Variable Expenses:</b>	
Repairs and Maintenance (60% Fixed)	4000
Power (40% Fixed)	18,000
Sundry expenses	9000
<b>Fixed Overhead:</b>	
Insurance	11,000
Depreciation	13,000
Rates and Taxes	12,000
Administrative Expenses	65,000
<b>Total</b>	<b>1,53,000</b>

2. From the following information, prepare flexible budget for the capacity level at 60%, 75% and 90%.

<i>Particulars</i>	<i>75% Capacity</i>
<b>Variable Expenses:</b>	
Direct Materials	12,000
Direct Labour	9000
Other Expenses	7000
<b>Semi-Variable Expenses:</b>	
Repairs and Maintenance (25% Fixed)	5000
Indirect labour (35% Fixed)	8000
Sales department salary (65% Fixed)	6000
<b>Fixed Overhead:</b>	
Administrative Expenses	10,000
Depreciation	7000
Rates and Taxes	5000
<b>Total</b>	<b>69,000</b>

3. From the following information, prepare flexible budget for the capacity level at 50%, 70%, 85% and 100%.

<i>Particulars</i>	<i>50% Capacity</i>
<b>Fixed Overhead:</b>	
Administrative Expenses	65,000
Depreciation	74,000
Rates and Taxes	66,000
Wages and Salary	95,000
<b>Semi-Variable Expenses:</b>	
Repairs and Maintenance (30% Fixed)	35,000
Indirect labour	79,000
Administrative Expenses (20% Fixed)	28,000
Sales department salary (60% Fixed)	38,000
<b>Variable Expenses:</b>	
Materials	21,700

*Contd.*

Labour	20,400
Other Expenses	79,000

4. The cost of an article at a capacity level of 5000 units is as follows:

<i>Particulars</i>	<i>Amount</i>
Material cost (100% Variable)	25,000
Labour cost (100% Variable)	15,000
Power (80% Variable)	1250
Repairs and Maintenance (75% Variable)	2000
Stores (100% Variable)	1000
Depreciation (100% Variable)	10,000
Inspection (20% Variable)	800
Administrative overhead (25% Variable)	5000
Selling overhead (50% Variable)	3000
<b>Total</b>	<b>63,050</b>

Find out budget for 4000 and 6000 units.

5. Prepare flexible budget from the following information.

<i>Particulars</i>	<i>7500 units</i>
Material cost (100% Variable)	37,500
Labour cost (100% Variable)	22,500
Power (80% Variable)	1850
Repairs and Maintenance (75% Variable)	3000
Stores (100% Variable)	1500
Depreciation (100% Variable)	15,000
Inspection (20% Variable)	750
Administrative overhead (25% Variable)	7500
Selling and distribution overhead (50% Variable)	4500

Find out total cost of production level of 6000 and 9000 units.

6. From the following information, prepare a flexible budget for the capacity of 2000, 3000 and 6000 units and also find out the cost per unit of the variable expenses.

<i>Particulars</i>	<i>3000 units</i>
Material cost (100% Variable)	18,000
Labour cost (80% Variable)	16,000
Repairs (65% Variable)	1600
Depreciation (100% Variable)	13,000
Administrative overhead (35% Variable)	11,000
Sundry Expenses (40% Variable)	6000
Stores (20% Variable)	5000
Indirect labour (100% Variable)	12,500

7. From the following information, prepare a flexible budget for the capacity of 5000, 7000 and 10,000 units and also find out the cost per unit of the variable expenses.

<i>Particulars</i>	<i>5000 units</i>
Material cost (100% Variable)	6000
Labour cost (60% Variable)	3000
Other Expenses (20% Variable)	4000
Repairs and Maintenance (100% Variable)	7000
Depreciation (100% Variable)	9000
Administrative overhead (40% Variable)	10,000
Insurance (50% Variable)	5000
Salary (65% Variable)	8000

8. The budget for production of 10,000 units is given below.

<i>Particulars</i>	<i>Cost per units (₹)</i>
Material cost	70
Labour cost	25
Variable over head	20

*Contd.*



Fixed overhead (₹ 1,00,000)	10
Direct variable expenses	5
Selling expenses( 10% Fixed)	13
Distribution expenses (20% Fixed)	7
Administrative overhead (₹ 50,000)	5
<b>Total</b>	<b>155</b>

Prepare the budget for production of 8000 and 6000 units.

9. Prepare the budget for production of 6000, 7000 and 8000 units.

<i>Particulars</i>	<i>10,000 units Cost per units (₹)</i>
Direct Material	60
Direct Labour	30
Variable overhead	25
Fixed overhead (₹ 1,50,000)	15
Variable overhead (Direct)	5
Selling expenses (10% Fixed)	15
Administrative overhead (₹ 50,000) for all level of production	5
Distribution expenses (20% Fixed)	5
<b>Total</b>	<b>160</b>

# 7

## Chapter

# Hotel Cost Ledgers

### Learning Objectives

*This chapter would help the reader to understand:*

- Guest register and guest folio
- Register of coupons issued
- Guest ledger
- Arrival–Departure Record
- Basis of Charging Room Rates
- Hubbart's Formula

### GUEST REGISTER

Guest register is a register in which guest particulars are recorded while registering the guest into the hotel (Fig. 7.1). This register is a very important book of record of the hotel and is frequently checked by appropriate authorities, including the police to keep check on foreign traffic, as well as to keep check on the hotels to ensure that no illegal and unauthorized activities are being conducted by them.

### GUEST FOLIO

Guest folio is a guest hotel credit bill (Fig. 7.2). The guest is registered in the hotel and then it is sent to the cashier's desk where the cashier opens guest hotel credit bill, normally called *Front Office Guest Folio*. Independent recovery of charges incurred for services availed by every resident guest is maintained in this form.

## REGISTER OF COUPONS ISSUED

## Welcome Slip

## Key Tag

Key tag is an identity card of the guest to be produced before the hotel authority whenever demanded, especially while signing checks in restaurant or other service department and to be surrendered on check out (Fig. 7.4).

		FRONT OFFICE GUEST BILL				No.			
GUEST NAME				ADDRESS					
No. of persons				Nationality					
Rooms				Arrival		Departure			
No.	Status	Rate	Date	Time		Date	Time		
Charges	1st	2nd	3rd	4th		Total	Check Details		
Bal. B/f.							Ch. ₹	Ch. ₹	Ch. ₹
							Bar	Res.	Rm. Ser.
Room Charge									
Service Charges									
Lux. Tax									
Exp. Tax									
F&B/Rm Serv.									
Bar									
Tel. Local									
Long Dist.									
Telex/Telegram									
Laundry/Valet									
Swimming pool							Tel/Telex.	Laundry	Other
V.P.O									
Sundries									
Total									
Adv. Deposit Received									
Allow. & Adjust.									
Dr. Bal.C/f									
Cr. Bal.C/f.									
Mode of Payment									
		This bill Amt.				For XYZ HOTEL			
Guest		Previous Bill Amt.							
Signature		Please Pay				F.O. Cashier			

Figure 7.2 Format of a Guest Folio

HOTEL XYZ		
WELCOME SLIP		
Mr./Mrs./Miss.		No. of Pax
Your Room No.	Room Rate:	per day
All other expenses will be charged separately. Service charges on all services rendered including apartment charges		
Bills are due for payment on presentation		
Cheques are not accepted		
Check-in Time:		Check-out Time:
Date:		
		Guest's Signature
<b>Note:</b> 12 hours notice must be given to intimate departure date and time. If payment is to be made by cheque, contact manager 24 hours prior to departure and obtain permission		

**Figure 7.3** *A Welcome Slip*

HOTEL XYZ	
KEY TAG	
Name of the Guest	Key of Room No.:
Arrival:	Rate:
Key of Safe Deposit Locker No.:	
Check-out Time:	Guest's Signature
<b>Instructions</b>	
<ul style="list-style-type: none"> <li>Please produce this key tag in exchange for your room key and when signing bills in the Restaurant, Bar and other departments.</li> <li>Guests are advised to keep their valuables in the safe deposit locker at the front office.</li> <li>This card must be surrendered to the front office cashier when checking out along with room key and safe deposit locker key.</li> </ul>	

**Figure 7.4** *Key Tag***Form-C**

Form-C is needed in the case of foreigners. Police departments also need to be intimated in writing about the arrival of foreigners into hotel within 24 hours of their arrival as prescribed by law. A format of Form-C is given in Fig. 7.5.

**Encashment Form**

Encashment form is provided under the Reserve Bank of India, foreign exchange rules and must bear RBI license number of issuing/exchange hotels (Fig. 7.6).

**FORM-C**

Rule 14

Sr. No.:

- (i) Name of Hotel/Rest House/ Dak Bungalow. Paying guest house \_\_\_\_\_
- (ii) Name of foreign visitor in full (in block capitals, surname first) \_\_\_\_\_
- (iii) Nationality \_\_\_\_\_ Passport No. \_\_\_\_\_
- (iv) Date and Place of Issue: \_\_\_\_\_
- (v) Address in India (other than tourist) \_\_\_\_\_
- (vi) Date of arrival in India \_\_\_\_\_ in Hotel \_\_\_\_\_
- (vii) Arrived from \_\_\_\_\_ whether employed in India Yes or No \_\_\_\_\_
- (viii) Purpose of Visit \_\_\_\_\_
- (ix) Projected duration of stay in India \_\_\_\_\_ in Hotel \_\_\_\_\_
- (x) Address to which proceeding \_\_\_\_\_
- (xi) Permanent Address \_\_\_\_\_
- (xii) No., date and office of issue of certificate of registration if any \_\_\_\_\_

Date:

Signature of Receptionist

**Note:** This copy should be sent to the Foreigner Registration Office as prescribed under Sec. 3(e) of the Registration of Foreigners Act, 1939

**Figure 7.5** *Form-C***Reservation Form**

Reservation form may be used by front office for the purpose of records to ensure continued sale of hotel rooms (Fig. 7.7).

**Allowance Voucher**

Allowance voucher is the document that supports all the payments made by the hotel (Fig. 7.8).

**Safety Deposit Locker Register**

Safety deposit locker register is the record of all those residential guests who avail facilities of hotel, as these guests may use the hotel's safety deposit lockers to keep their valuables for safe custody (Fig. 7.9).

**Bell Boy Errand Card (Arrival)**

Bell Boy Errand Card is the detailed bell boy's report of the guest, as he acts as a hotel's salesman who sells the facilities, services and amenities provided by the hotel or try to sell the hotel in totality, i.e. the name and fame of the hotel is in bell boy's capacity (hands) (Fig. 7.10).

### HOTEL XYZ ENCASHMENT CERTIFICATE

RBI  
Lic No.:

Sr. No.:  
Date:

We hereby certify that we have purchased today foreign currency from Mr/Mrs/Miss \_\_\_\_\_ Holder of Passport No. \_\_\_\_\_ Nationality \_\_\_\_\_ and paid net amount in rupees after adjusting the amount towards settlement of bills for goods supplied/services rendered as per details below:

A. Details of Foreign currency notes/coins/travellers cheques purchased \_\_\_\_\_ Currency Purchased

(Including) clearly Notes and travellers cheques separately	Amount	Rate	Rupees Equivalent
(1)	(2)	(3)	(4)
			Total: _____

B. Details of adjustments made towards settlements of bills for goods supplied/services rendered.

Bill No(s) (1)	Date (2)	Amount Total (3)

C. Net amount paid in rupees \_\_\_\_\_ Amount in words \_\_\_\_\_ (Total under A minus under B)

[VALIDITY 3 MONTHS  
FROM THE DATE OF ISSUE]

Stamp & Signature of Authorized  
Money changer

**Note:** This certificate should be preserved by the holder to facilitate re-conversion of the rupee balance, (out of the amount at C) if any, into foreign currency on departure from India/or payment of passage/freight cost in rupees, if necessary.

**Figure 7.6** *Encashment Form*

### HOTEL XYZ RESERVATION FORM

Date:

Time:

Reservation For:

No. of Persons:

Adult:

Child:

Time of Arrival:

Mode of Transport:

Air

Road

Rail

Sea

Bus

Car

Type of Room

Single

Double

Suite

Departure:      Date:

Time:

Reservation made by:

Contact Address:

Telephone No.:

Mode of Payment

Bill to be paid by:

Guest's Signature

Room No.:

Rate:

Terms:

Remarks:

Signature of Receptionist

**Figure 7.7** *Reservation Form*

### HOTEL XYZ ALLOWANCE VOUCHER

Name:

No.:

Account No.:

Date:

Detailed Explanation	Amount	Amount

Rupees (in words): \_\_\_\_\_

Checked by	Prepared by	Authorized by	F.O.M.	Night Auditor

**Figure 7.8** *Allowance Voucher*



<b>HOTEL XYZ</b> <b>Safety Deposit Locker Register</b>	
Name: _____	Room No.: _____
Permanent Address: _____	
Locker No.: _____	Authorized Signature _____
Date: _____	Key Delivered by: _____
<b>Note:</b> A Charge of ₹ _____ will be made for loss of SAFE DEPOIST KEYS	
Guest's Signature: _____	Cashier's Signature: _____

**Figure 7.9** *Safety Deposit Locker Register*

<b>HOTEL XYZ</b> <b>Bell Boy Errand Card</b>		
Room No.: _____	Name of the Guest: _____ (Arrival) _____	
Item: _____	No. of Pieces: _____	
Suitcase: _____	Briefcase: _____	Hand Bags: _____
Package: _____	Overcoat: _____	Others: _____
Company: _____	Contact: _____	Departure Date _____
Remarks: _____		
Air-Conditioner: _____	Television: _____	Brass Ashtrays S/L: _____
Music: _____	Leather Folder: _____	Bath Robe: _____
Mini Bar Replenished: _____		
Bell Boy: _____	Time: _____	Date: _____

**Figure 7.10** *Bell Boy Errand Card*

### Guest Registration Card

Guest registration card is a mandatory requirement that all guests over the age of 16 years, whether ordinary or VIP or Indian or Foreigner, arriving in any hotel which may be small or large, categorized or un-categorized, one star to five star deluxe, must fulfil. They must give basic

information about them and fill up either Visitors register or hotel register or red book/form or a G.R. card (Fig. 7.11).

<b>HOTEL XYZ</b> <b>Guest Registration Card</b>						
Name _____		First Name and Initials _____		Date of Birth _____		
Company _____		Address _____				
Designation _____ Nationality _____ Passport No. _____ Date of Issue _____ Place of Issue _____ Certificate of Registration (if any) No. _____ Dt. of Issue _____ Office of Issue _____ Date of Arrival in India _____ Whether Employed in India [ ] Yes [ ] No			Arrival from _____ Going to _____ Date of Arrival in Hotel _____ Time of Arrival in Hotel _____ Date of Departure from Hotel _____ Profession _____ Profession _____ Purpose of Visit _____ <b>CHECK OUT TIME: 12 NOON</b>			
THE HOTEL WILL NOT BE RESPONSIBLE FOR ANY VALUABLES LEFT BY THE GUEST IN THE ROOM. SAFE DEPOSIT BOXES ARE AVAILABLE FREE OF CHARGE AT THE FRONT OFFICE CASHIER. VISITORS ARE NOT PERMITTED IN GUEST ROOM AFTER 11.00 P.M.						
I agree to abide by the rules of the hotel and shall settle my account once it amounts to ₹ 10,000.						
<u>Signature of the Guest</u>						
Room No.	No. of Persons		Rate	Booked by	Payment by and bill to	Initial
	Adults	Children				
I AGREE TO RELEASE ROOM _____ BY 12 NOON ON _____ SHOULD I FAIL TO CHECK OUT, I AUTHORISE THE MANAGEMENT TO PACK AND REMOVE MY BELONGINGS TO THE HOTEL CHECK ROOM SO THAT THIS ROOM IS AVAILABLE FOR INCOMING GUEST WITH CONFIRMED RESERVATION.						
GUEST SIGNATURE						

**Figure 7.11** Guest Registration Card

### Night Auditor's Sales Recapitulation Sheet

Night auditor sales recapitulation sheet contains the following detailed reports which are forwarded to the accounts department, in respect of all shifts of previous day (Fig. 7.12):

- (a) Front office folio of all resident guests who checked out previous day
- (b) Bills with copies of K.O.T. (Kitchen Order Ticket) with every sales sheet
- (c) Copies of V.P.O. (Visitors Paid Out)/allowance voucher and other vouchers
- (d) F.O. cashier's summaries for the previous day
- (e) Total cash in local and foreign currencies in separate packets which are duly sealed by F.O. cashier along with cashier's cash summaries
- (f) Travellers cheques, travel agency coupons, credit card details collected from F.O. cashier along with his summaries
- (g) Room report and visitors tabular ledger copies
- (h) Night auditor's report which contains various analysis, transcripts made during the course of audit, and observations along with his remarks.

HOTEL XYZ										
NIGHT AUDITOR							DAY	MONTH	YEAR	
No. of Persons	Food	Bev.	Tax.	Tips	Misc.	Charges				
						Adv.	Cash	Amount	Room	Name
Night Auditor Signature							Received by:			

**Figure 7.12** *Night Auditor's Sales Recapitulation Sheet*

### GUEST LEDGER

Guest ledger provides information in respect of all guests who have checked out till date (Fig. 7.13).



## ROOM RATES

The hotel earns major revenue from the sale of rooms. Fixing the room rate is an important aspect to which a hotelier has to pay great deal of attention. The following are some of the factors that must be kept in mind at the time of deciding the room rates of a small or large hotel in small towns or big cities according to the circumstances in general:

1. The importance of the city in which the hotel is situated. If other conditions are the same, the room rent of a hotel of a large city may be kept higher than the room rent of a small city.
2. The total investment in construction of rooms and its furnishing etc.
3. The expenditure incurred on non-revenue services.
4. The locality in which the hotel is situated gains prominence while fixing room rates, for example, posh locality with shopping facilities, approach to railway stations, airport, etc.
5. The location of the rooms—well-ventilated rooms, rooms opening to better views, dark rooms, etc.
6. The size of the room such as single room, double room, etc.
7. The various amenities that are provided to the guests in the hotel, such as air-conditioning, running hot and cold water, attached bath room, carpeting, telephone, etc.
8. While fixing the room rates, it is indispensable to keep in view the point of average occupancy, slack season complimentary rates, reduced rates for groups, etc. because they affect the revenue of the hotel.

### **Basis of Charging Room Rates**

In general, there are three principal bases of charging room rate and it is at the option of the hotel to adopt one of the following, subject to a minimum charge for one full day:

#### ***Basis of Twenty Four Hours***

According to this system, the guest is charged a specific amount for 5 hours from the time of his occupying the room in the hotel. After completing the first 24 hours, he is charged for the next 24 hours or a part of that at full rate if he continues his stay in the hotel.

#### ***Basis of Night Spent***

This system is more common in highway hotels. The guests are charged for overnight occupancy. A full night charge is levied for the first night the visitors spend at the hotel. A visitor is supposed to vacate the room so occupied by the dinner time which may be assumed as 7.30 P.M., failing which he is liable to pay the charge for another night.

#### ***Basis of Check Out Time***

Check out is fixed at convenient hours by hotel, when the guest can check out from the hotel after paying a reasonable amount. This system is more common today in India. The check out time can be different from hotels of one city to hotels of other city, according to local conditions and railway and bus timings.

It is beneficial for the guests on account of the following reasons:

- (i) The guest can get accommodation in the hotel at this time easily because many guests check out and vacate rooms in the hotel.
- (ii) If the guests like to pay the reasonable charge for their stay, they may vacate the room at this time. If they continue their stay after this time, they have to pay one full day's charge according to the rules.
- (iii) If the check-in and check-out time has to be one and the same, the guest who occupies the room after the check-in time has to pay one day's charge from the time he occupies till the check-out time, even if the duration is of an hour or so. At the check-out time, he is again charged for one full day.

It is helpful for the employees of the hotel in many respects:

- (i) The hotel gets certain rooms at this time for obliging the new guests by allotting rooms.
- (ii) The front office can know room occupancy percentage at this time easily.
- (iii) The hotel can charge all the guests staying in the hotel for the next day without bothering the visitor's arrival timings. Thus, there are fewer chances of mistakes.

## THE HUBBART FORMULA

One of the daunting questions confronted by the innkeepers from the beginning is that, where would he start in determining the fair price for a guest room? What is the fair value etc.?

Initially, an instinctual approach was applied, i.e. based on the instinct and past experience of the hotelier, the rates are set. This approach seems to be ineffective and the financial institutions found it difficult to gauge the income statements of the hotels for the financing purposes, and were looking for a standardized rate formula.

In 1940, the American Hotel Association (today's American Hotel and Lodging Association) entrusted Mr. Ray Hubbard the task of developing a method to calculate room rates. Mr. Hubbard developed a method to calculate a hotel room rate based on costs incurred in operating the hotel and a reasonable return on investment (R.O.I) for the investors.

Mr. Hubbard has evolved three steps in arriving at a room rate:

1. The operational costs/expenditure and include a certain percentage of returns on land and building and another percentage on hotel keeping capital employed.
2. Deduct from the above cost the incomes received through rentals, food and beverage sales and other miscellaneous sales (all sales other than rooms).
3. Divide the remaining for charging room rates by projected number of rooms occupied.

### HUBBERT FORMULA

Desired profits

- Income Taxes
- Management Fees
- Fixed Costs

## Alternating Method of Hubbart Formula

Under this method, Hubbart tries to incorporate three different sections or schedules into its calculations.

### Schedule I

This schedule attempts to determine the cost incurred with the hotel operations and incorporate a reasonable return on investment (ROI) (Fig. 7.15).

	₹	₹
<b>OPERATING EXPENSES:</b>		
Rooms Department	xxxx	
Telephone Department	xxxx	
Administrative and General	xxxx	
Payroll Taxes and Employee Benefits	xxxx	
Advertising and Promotion	xxxx	
Heat, Light and Power	xxxx	
Repairs and Maintenance	xxxx	
<b>TOTAL OPERATING EXPENSES [A]</b>		<b>xxxxxx</b>
<b>TAXES AND INSURANCE</b>		
Real Estate and personal Property Taxes	xxx	
Franchise Taxes and Fees	xxx	
Insurance on Building and Contents	xxx	
Lease Costs (Equipment and/or Vehicles)	xxx	
<b>TOTAL TAXES AND INSURANCE [B]</b>		<b>xxxx</b>
<b>DEPRECIATION AT BOOK VALUE</b>		
Building	xxx	
Furniture, Fixtures and Equipments	xxx	
<b>TOTAL DEPRECIATION [C]</b>		<b>xxxx</b>
<b>FAIR MARKET RETURN ON INVESTMENT</b>		
<b>(ROI) PROPERTY</b>		
Land		
Building		
Furniture, Fixtures and Equipment		
<b>TOTAL FAIR MARKET ROI [D]</b>		<b>xxxx</b>
<b>TOTAL [A + B + C + D]</b>		<b>xxxxxx</b>
<b>DEDUCT [Income from sources other than rooms]</b>		
Income from store rentals/leases	xxx	
Profit [Loss] from Food and Beverage operations	xxx	
Income from other Sources [ancillary revenue]	xxx	
<b>TOTAL INCOME FROM OTHER SOURCES</b>		<b>xxxx</b>
<b>AMOUNT NEEDED FROM ROOM DEPARTMENT</b>		
<b>TO COVER COST AND REALISE A FAIR MARKET ROI</b>	<b>xxxxxx</b>	

Figure 7.15 Specimen Format of Schedule I

### Schedule II

In this schedule, Hubbart considers the total number of room nights available for sale in a year (365 days times the number of rooms available per night). He also considers the estimated occupancy percentage. Occupancy expectations must be based on a detailed analysis of competition, market supply, local economic factors and population, among others. As a general rule, 70% expected occupancy has to be considered as a benchmark. Figure 7.16 shows a format of Schedule II.

			₹
1. Amount Needed from Guest Room Sales (Schedule 1)			xxxxx
2. Number of Guest Rooms Available	xxx		
3. Number of Rooms Available on an Annual Basis. Item 2 multiplied by 365 (xxx × 365)		100%	xxxx
4. Less: Allowance for Average Vacancy	<u>-30%</u>		<u>- xxx</u>
5. Number of Rooms to be occupied Based on Average Occupancy	70%		<u>xxxx</u>
6. Average Daily Rate required to Cover Costs and Provide Reasonable ROI (Item 1 divided by Item 5)			xxxx

**Figure 7.16** Specimen Format of Schedule II

### Schedule III

In this schedule, the Hubbart formula tries to consider the type, size and configuration of the rooms, where the larger rooms are more expensive. Here Hubbart formula incorporates a square footage provision, where the measurement of the total square guest room area is calculated. A format of Schedule II is shown in Fig. 7.17.

			₹
1. Amount Needed from Guest Room Sales (Schedule I)			xxxxx
2. Square Foot Area of Guest Rooms		xxxxxx	
3. Less: Allowance for Average occupancy (xxxxxx × 30%)	<u>xxx</u>		
4. Net Square Footage of Occupied Rooms (xxxxxx × 70%)	<u>xxxxx</u>		
5. Average Annual Rental per Square Foot (Item 1 divided by Item 4)			xxx
6. Average Daily Rental per Square Foot (365 divided by Item 5)			xx

**Figure 7.17** Specimen Format of Schedule II

### ILLUSTRATION

1. Calculate average room rate with the help of Hubbart formula:

Cost of land, building, furniture and fixtures	₹ 37,60,00,000
Working capital	₹ 2,40,00,000



Financing of investment	₹ 32,50,00,000
Debt at 10% interest equity	₹ 7,50,00,000
Projected number of rooms occupied 75% (total number of rooms 80,000)	
Desired return on equity at 15% on	₹ 10,00,00,000
Income taxes at 50% on	₹ 3,00,00,000
Interest expenses (₹ 32,50,00,000 at 10%)	
Estimated depreciation, municipal taxes and insurance	₹ 3,75,00,000
General and administrative expenses	₹ 3,30,00,000
Advertising and sales promotion	₹ 2,60,00,000
Heat, light and power	₹ 86,00,000
Repairs and maintenance	₹ 1,24,00,000
Estimated departmental profit excluding rooms are:	
Food and beverage	₹ 2,95,00,000
Telephone	₹ 45,00,000
Laundry	₹ 40,00,000
Others	₹ 1,20,00,000
Estimated room department expense	₹ 25,00,000

***Solution:***

	Amount (in lakhs)	
Particulars	₹	₹
Cost of Land, Building, Furniture and Fixtures	3760	
Add: Working Capital		240
<b>Total Investment</b>		<b>4000</b>
Financing of Investment	3250	
Debt @ 10% interest equity	750	
<b>Total Financing</b>		<b>4000</b>
Desired Return on Equity at 15% on ₹ 10,00,00,000	150	
Income Taxes at 50% on ₹ 3,00,00,000	150	
<b>Required Profit Before Income Taxes</b>	<b>300</b>	
Interest Expense @ 10% ₹ 32,50,00,000	325	
<b>Required Profit Before Interst and Taxes</b>	<b>625</b>	
Estimated Depreciation, Municipal Taxes and Insurance	375	
<b>Required House Profit [A]</b>		<b>1000</b>

**Budgeted Deductions:**

General and Administrative Expenses	330	
Advertising and Sales promotion	260	
Heat, Light and Power	86	
Repairs and Maintenance		124

**Add: Budgeted Deductions From Income [B]** **800**

**Required Gross Operating Income [A + B]** **1800**

**Other Departmental Incomes:**

Food and Beverage		295
Telephone	45	
Laundry	40	
Others	120	

**Less: Estimated Departmental Profit**

**Excluding Rooms** **500**

**Required Rooms Department Profit** **1300**

**Add: Estimated Rooms Department Expense** **25**

**Required Rooms Department Revenue** **1325**

Projected Number of Rooms Occupied = 75% on 80,000 rooms = 60,000 rooms

**Average Room Rate [ARR]**

= Required Rooms Revenue/Projected number of rooms occupied

= 13,25,00,000/60,000 = ₹ 2,208.33

**Objective Type Questions**

*Fill in the blanks:*

- (a) \_\_\_\_\_ is a register in which guest particulars are recorded while registering the guest into the hotel.
- (b) \_\_\_\_\_ is an identity card of the guest to be produced before the hotel authority whenever demanded.
- (c) Form-C is needed in case of \_\_\_\_\_.
- (d) Average Room Rate is calculated with the help of \_\_\_\_\_ formula.
- (e) If Basis of Twenty Four Hours for charging room rates is adopted the guest is charged a specific amount for \_\_\_\_\_ hours from the time of his occupying the room in the hotel.

## Review Questions

1. What is a guest register?
2. What is a guest folio?
3. What is a welcome slip?
4. What is a key tag?
5. What is Form-C?
6. What is Encashment Form?
7. What is Reservation Form?
8. What is allowance voucher?
9. What is safety deposit locker register?
10. What is bell boy errand card (Arrival)?
11. What is guest registration card?
12. What is night auditor's sales recapitulation sheet?
13. What is a guest ledger?
14. What are the factors to be considered while fixing the room rate?
15. What are the principles for charging room rates?
16. Give hubbart formula.

# 8

## Chapter

# Standard Costing

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of standard costing
- Advantages and disadvantages of standard costing
- Types of standard
- Variance analysis—direct material and direct labour

### MEANING OF STANDERD COSTING

Standard costing is a management control system, which is found in particular in the manufacturing industry. Just like budgetary control, standard costing is also part of the control system. Both use variance analysis. Standard costing is a unitary concept, i.e. it uses standard material cost or standard labour cost. Budgeting, on the other hand, uses these unit standard costs to compile total costs, e.g. material costs or labour costs.

Variances represent the differences between standard costs and actual costs. The standard cost is what the cost is estimated to be and this is compared to what the cost actually is.

Variances are classified as favourable if the actual costs are less than the standard costs and profit is increased as a consequence. Adverse variances decrease profits. Some variances may be controllable if the individual manager can influence the actual costs.

Some organizations operate on the principle of *management by exception*. The accountant presents an exception report which highlights the significant variances. This means management need only investigate certain variances which lie outside the set tolerance levels.

A standard cost is defined as a pre-determined cost calculated in relation to a prescribed set of working conditions, correlating technical specifications and scientific measurements of materials

and labour to the prices and wage rates expected to apply during the period to which the standard cost is expected to relate, with an addition of an appropriate share of budgeted overhead. It is a cost worked out in advance of production of the expected cost of a product or service.

According to CIMA (London), “standard costing is a control technique which compares standard costs and revenues with actual results to obtain variances which are used to stimulate improved performance.” The use of standard costing is not confined to industries having repetitive processes and homogeneous products only. This technique has established the advantages of its use in industries having non-repetitive processes such as manufacture of automobile, turbines, boilers and heavy electrical equipment.

## ADVANTAGES AND DISADVANTAGES OF STANDARD COSTING

### Advantages of Standard Costing

1. It provides management with a consistent method of comparing the actual performance with the planned performance.
2. It provides a means of ensuring that production resources are purchased and used efficiently.
3. In establishing standards, management can examine and appraise existing practices and procedures to ensure cost effectiveness and efficiency.
4. It can inculcate cost-consciousness in the staff.
5. It helps to motivate staff by setting realistic standards.
6. By using variance analysis, performance can be monitored and improvements in work methods can be achieved.

### Disadvantages of Standard Costing

1. Standard setting is a lengthy and costly procedure.
2. Standards are often seen by the staff as restrictions on their behaviour, which can lead to dysfunctionism.
3. Reporting variances may not be timely, and cost-effective, and may not encourage managerial response.
4. Standards invariably produce variances, some of which may not be controllable, e.g. material prices which can result in unnecessary reporting and investigation.
5. Standard costing may be inappropriate for certain kinds of manufacturing, e.g. Just-in-Time.

## TYPES OF STANDARD

There are four types of standard.

1. **Ideal standard**—assumes perfect production conditions with no mechanical failure, no stock-outs, no staff absenteeism, etc. It is unattainable, but is an indication of what to strive for.
2. **Attainable standard**—is a realistic target and is based on efficient working conditions with allowance made for machine breakdown, stock-outs, etc.

3. **Basic standard**—is a standard set for use over a long period of time and is used to compare with current standards to see the effect of changes in conditions over the years.
4. **Current standard**—is set to reflect current conditions, so have limited use in time. In times of inflation, such standards may be set monthly.

## VARIANCE ANALYSIS

Variance analysis is of two types—direct material and direct labour.

### Direct Material Variance

The main reasons for actual and estimated costs being different are either a change in the price of materials or a change in the usage of material.

1. Materials price variance is the difference in cost that results from the price being different to the standard.

$$\text{MPV} = (\text{Standard price} - \text{Actual price}) \times \text{Actual quantity}$$

2. Materials usage variance is the difference between the actual usage of material and the standard usage multiplied by the standard price.

$$\text{MUV} = (\text{Actual quantity} - \text{Standard quantity}) \times \text{Standard price}$$

3. Material cost variance or total material variance is the difference between actual material cost and standard material cost

$$\text{MCV} = (\text{Std. qty.} \times \text{Std. Price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$\text{MCV} = \text{MPV} + \text{MUV}$$

### Direct Labour Variance

1. Labour rate variance is the difference between the actual wage rate and the standard rate of pay times the actual hours worked.

$$\text{LRV} = (\text{Std. rate} - \text{Actual rate}) \times \text{Actual hours}$$

2. Labour efficiency variance is the difference between the actual hours worked and the standard hours, i.e. the hours that should have been worked to produce the actual output.

$$\text{LEV} = (\text{Std. hours} - \text{Actual hours}) \times \text{Std. rate}$$

3. Labour cost variance or total labour variance is the difference between actual labour cost and standard labour cost.

$$\text{LCV} = (\text{Std. Rate} \times \text{Std. hours}) - (\text{Actual rate} \times \text{Actual hours})$$

$$\text{LCV} = \text{LRV} + \text{LEV}$$

## ILLUSTRATIONS

1. Product 'A' requires 10 kg of materials at the rate of ₹ 4 per kg. The actual consumption of material for manufacturing product 'A' came to 12 kg.

Calculate: (a) MCV, (b) MPV and (c) MUV.

**Solution:**

$$\begin{aligned}
 \text{(a) MCV} &= (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price}) \\
 &= (10 \times 4) - (12 \times 4.5) \\
 &= 40 - 54 \\
 &= -14 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) MPV} &= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.} \\
 &= (4 - 4.5) \times 12 \\
 &= (-0.5) \times 12 \\
 &= -6 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c) MUV} &= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price} \\
 &= (10 - 12) \times 4 \\
 &= (-2) \times 4 \\
 &= -8 \text{ (A)}
 \end{aligned}$$

2. A furniture manufacturing uses sun mica tops for tables. From the following information, find out MCV, MPV, MUV:

Std. qty. = 4000 sq ft

Actual qty. = 4300 sq ft

Std. price = ₹ 5

Actual price = ₹ 5.50

**Solution:**

$$\begin{aligned}
 \text{MCV} &= (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price}) \\
 &= (4000 \times 5) - (4300 \times 5.5) \\
 &= 20,000 - 23,650 \\
 &= -3650 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{MPV} &= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.} \\
 &= (5 - 5.5) \times 4300 \\
 &= (-0.5) \times 4300 \\
 &= -2150 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{MUV} &= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price} \\
 &= (4000 - 4300) \times 5 \\
 &= (-300) \times 5 \\
 &= -1500 \text{ (A)}
 \end{aligned}$$

3. From the following particulars, calculate MPV, MUV, and MCP:

Materials	Std. qty.	Std. price	Actual qty.	Actual price
A	200	10	300	12
B	200	5	100	10
C	100	8	600	6

**Solution:**

$$\text{MCV} = (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$A = (200 \times 10) - (300 \times 12) = 2000 - 3600 = -1600 \text{ (A)}$$

$$B = (200 \times 5) - (100 \times 10) = 1000 - 1000 = 0$$

$$C = (100 \times 8) - (600 \times 6) = 800 - 3600 = -2800 \text{ (A)}$$

$$\text{Total MCV} \quad \underline{\underline{-4400 \text{ (A)}}}$$

$$\text{MPV} = (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$$

$$A = (10 - 12) 300 = 300 (-2) = -600 \text{ (A)}$$

$$B = (5 - 10) 100 = 100 (-5) = -500 \text{ (A)}$$

$$C = (8 - 6) 600 = 600 (2) = 1200 \text{ (F)}$$

$$\text{Total MPV} \quad \underline{\underline{100 \text{ (F)}}}$$

$$\text{MUV} = (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$A = 10 (200 - 300) = 10 (-100) = -1000 \text{ (A)}$$

$$B = 5 (200 - 100) = 5 (100) = 500 \text{ (F)}$$

$$C = 8 (100 - 600) = 8 (-500) = -4000 \text{ (A)}$$

$$\text{Total MUV} \quad \underline{\underline{-4500 \text{ (A)}}}$$

4. From the following particulars, calculate MPV, MUV, and MCP.

Materials	Std. qty.	Std. price	Actual qty.	Actual price
A	1050	2.00	1100	2.25
B	1500	3.25	1400	3.50
C	2100	3.50	2000	3.75

**Solution:**

$$\text{MCV} = (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$A = (1050 \times 2) - (1100 \times 2.25) = 2100 - 2475 = -375 \text{ (A)}$$

$$B = (1500 \times 3.25) - (1400 \times 3.5) = 4875 - 4900 = -25 \text{ (A)}$$

$$C = (2100 \times 3.5) - (2000 \times 3.75) = 7350 - 7500 = -150 \text{ (A)}$$

$$\text{Total MCV} \quad \underline{\underline{-550 \text{ (A)}}}$$

$$\text{MPV} = (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$$

$$A = (2 - 2.25) 1100 = 1100 (-0.25) = -275 \text{ (A)}$$

$$B = (3.25 - 3.5) 1400 = 1400 (-0.25) = -350 \text{ (A)}$$

$$C = (3.5 - 3.75) 2000 = 2000 (-0.25) = -500 \text{ (A)}$$

$$\text{Total MPV} \quad \underline{\underline{-1125 \text{ (A)}}}$$



$$\text{MUV} = (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$A = 2 (1050 - 1100) = 2 (-50) = -100 \text{ (A)}$$

$$B = 3.25 (1500 - 1400) = 3.25 (100) = 325 \text{ (F)}$$

$$C = 3.5 (2100 - 2000) = 3.5 (100) = 350 \text{ (F)}$$

$$\text{Total MUV} \quad \underline{575 \text{ (F)}}$$

5. From the following, calculate MCV, MPV, and MUV:

$$\text{Std. qty.} \quad - 3600$$

$$\text{Std. price} \quad - ₹ 3$$

$$\text{Actual qty.} \quad - 4000$$

$$\text{Actual price} \quad - ₹ 3.50$$

***Solution:***

$$\begin{aligned} \text{MCV} &= (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price}) \\ &= (3600 \times 3) - (4000 \times 3.5) \\ &= 10,800 - 14,000 \\ &= -3200 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{MPV} &= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.} \\ &= (3 - 3.5) \times 4000 \\ &= (-0.5) \times 4000 \\ &= -2000 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{MUV} &= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price} \\ &= (3600 - 4000) \times 3 \\ &= (-400) \times 3 \\ &= -1200 \text{ (A)} \end{aligned}$$

6. Compute the cost Variances from the following data:

$$\text{Std. qty. per product} = 4 \text{ units}$$

$$\text{Std. price per unit of raw material} = ₹ 3$$

$$\text{Actual quantity for the total output} = 18,000$$

$$\text{Actual price per unit} = ₹ 4$$

$$\text{Output} = 5000 \text{ units}$$

***Solution:***

$$\begin{aligned} \text{MCV} &= (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price}) \\ &= (20,000 \times 3) - (18,000 \times 4) \\ &= 60,000 - 72,000 \\ &= -12,000 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{MPV} &= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.} \\ &= (3 - 4) \times 18,000 \end{aligned}$$

$$= (-1) \times 18,000$$

$$= -18,000 \text{ (A)}$$

$$\text{MUV} = (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$= (20,000 - 18,000) \times 3$$

$$= (2000) \times 3$$

$$= 6000 \text{ (F)}$$

7. Bell Chemicals Ltd. provides the following information. Calculate MCV, MPV, MUV and MMV.

Materials	Std. qty.	Std. price	Actual qty.	Actual price
X	80	6	75	7
Y	40	4	50	5

**Solution:**

$$\text{MCV} = (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$X = (80 \times 6) - (75 \times 7) = 480 - 525 = -45 \text{ (A)}$$

$$Y = (40 \times 4) - (50 \times 5) = 160 - 250 = -90 \text{ (A)}$$

$$\text{MPV} = (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$$

$$X = (6 - 7) 75 = 75 (-1) = -75 \text{ (A)}$$

$$Y = (4 - 5) 50 = 50 (-1) = -50 \text{ (A)}$$

$$\text{MUV} = (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$X = 6 (80 - 75) = 6 (5) = 30 \text{ (F)}$$

$$Y = 4 (40 - 50) = 4 (-10) = -40 \text{ (A)}$$

$$\text{MMV} = (\text{Revised std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$\text{Revised std. qty.} = \frac{\text{Total actual qty.} \times \text{Std. qty. of X}}{\text{Total std. qty.}}$$

$$\text{Revised std. qty. (X)} = \frac{125 \times 80}{120} = 83$$

$$\text{Revised std. qty. (Y)} = \frac{125 \times 40}{120} = 42$$

$$\text{MMV (X)} = (83 - 75) 6 = 8 \times 6 = 48 \text{ (F)}$$

$$\text{MMV (Y)} = (42 - 50) 4 = -8 \times 4 = -32 \text{ (A)}$$

8. From the following information, calculate MCV, MPV, MUV and MMV.

Materials	Std. qty.	Std. price	Actual qty.	Actual price
X	80	8	90	7.50
Y	70	3	80	4.00

**Solution:**

$$\text{MCV} = (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$X = (80 \times 8) - (90 \times 7.5) = 640 - 672 = -35 \text{ (A)}$$

$$Y = (70 \times 3) - (80 \times 4) = 210 - 320 = -110 \text{ (A)}$$

$$\text{MPV} = (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$$

$$X = (8 - 7.5) 90 = 90 (0.5) = 45 \text{ (F)}$$

$$Y = (3 - 4) 80 = 80 (-1) = -80 \text{ (A)}$$

$$\text{MUV} = (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$X = 8 (80 - 90) = 8 (-10) = -80 \text{ (A)}$$

$$Y = 3 (70 - 80) = 3 (-10) = -30 \text{ (A)}$$

$$\text{MMV} = (\text{Revised std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$\text{Revised std. qty.} = \frac{\text{Total actual qty.} \times \text{Std. qty. of X}}{\text{Total std. qty.}}$$

$$\text{Revised. std. qty. (X)} = \frac{170 \times 80}{150} = 91$$

$$\text{Revised std. qty. (Y)} = \frac{170 \times 70}{150} = 79$$

$$\text{MMV (X)} = (91 - 90) 8 = 1 \times 8 = 8 \text{ (F)}$$

$$\text{MMV (Y)} = (79 - 80) 3 = -1 \times 3 = -3 \text{ (A)}$$

9. The following information relates to a job standard rate of wages ₹ 10 per hour:

Standard hours      – 300

Actual hours         – 200

Actual rate of wages ₹ 12 per hour

Calculate:

(a) Labour cost variance

(b) Labour efficiency variance

(c) Labour rate variance

**Solution:**

$$(a) \text{ LCV} = (\text{Std. rate} \times \text{Std. hours}) - (\text{Actual rate} \times \text{Actual hours})$$

$$= (10 \times 300) - (12 \times 200)$$

$$= 3000 - 2400$$

$$= 600 \text{ (F)}$$

$$(b) \text{ LEV} = (\text{Std. hours} - \text{Actual hours}) \times \text{Std. rate}$$

$$= (300 - 200) \times 10$$

$$= 1000 \text{ (F)}$$

$$\begin{aligned}
 \text{(c) LRV} &= (\text{Std. rate} - \text{Actual rate}) \times \text{Actual hours} \\
 &= (10 - 12) \times 200 \\
 &= -2 \times 200 \\
 &= -400 \text{ (A)}
 \end{aligned}$$

10. A manufacturing company which has adopted standard costing furnishes the following information:

Standard

Materials for 70 kg of finished product—100 kg  
Price of material—₹ 1 per kg

Actual

Output — 2,10,000 kg  
Materials used — 2,80,000 kg  
Cost of material — ₹ 2,52,000

Std. quantity of raw material for 2,80,000 kg is 3,00,000 kg (70 kg of raw materials required for 100 kg)

Calculate MCV, MPV and MUV. Actual raw material for 2,80,000 is 2,80,000 kg.

**Solution:**

$$\text{Actual rate is } \frac{\text{Cost of material}}{\text{Material used}} = \frac{2,52,000}{2,80,000} = 0.90$$

$$\begin{aligned}
 \text{MCV} &= (\text{Std. qty.} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price}) \\
 &= (3,00,000 \times 1) - (2,80,000 \times 0.9) \\
 &= 3,00,000 - 2,52,000 \\
 &= 48,000 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{MPV} &= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.} \\
 &= (1 - 0.9) \times 2,80,000 \\
 &= (0.1) \times 2,80,000 \\
 &= 28,000 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{MUV} &= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std price} \\
 &= (3,00,000 - 2,80,000) \times 1 \\
 &= (20,000) \times 1 \\
 &= 20,000 \text{ (F)}
 \end{aligned}$$

### Objective Type Questions

Fill in the blanks:

- (a) \_\_\_\_\_ represent the differences between standard costs and actual costs.  
(b) A \_\_\_\_\_ cost is a pre-determined cost.

- (c) \_\_\_\_\_ variance is the difference between the actual usage of material and the standard usage multiplied by the standard price.
- (d) \_\_\_\_\_ variance is the difference between the actual hours worked and the standard hour.
- (e) The main reason for actual and estimated costs being different are either a change in the \_\_\_\_\_ of materials or a change in the \_\_\_\_\_ of material.

### Review Questions

1. What is meant by standard costing?
2. What is variance?
3. What are the advantages and disadvantages of standard costing?
4. What are the types of standards?
5. What is material variance? Give the related formulae.
6. What is labour variance? Give the related formulae.

### Exercises

1. The standard materials for introduction were as follows:

Material A—60 units @ ₹ 15/unit

Material B—80 units @ ₹ 20/unit

The actual materials were as follows:

Materials A—64 units @ ₹ 17

Materials B—95 units @ ₹ 18

Calculate:

- (a) Material price variance
  - (b) Material usage variance
  - (c) Material cost variance
2. From the following data, calculate:
    - (a) Material cost variance
    - (b) Material price variance
    - (c) Material usage variance

Material	Standard	Actual
A	40 units at ₹ 50/unit	50 units at ₹ 50/unit
B	60 units at ₹ 40/unit	60 units at ₹ 45/unit

3. From the following particulars, calculate:
  - (a) Material cost variance
  - (b) Material price variance

## (c) Material usage variance

Standard quantity	250 units
Actual quantity	260 units
Standard Price	₹ 5 per unit

## 4. From the following particulars, calculate:

- (a) Material cost variance
- (b) Material price variance
- (c) Material usage variance

Standard	2400 units	@ ₹ 2.50 per unit
Actual	2500 units	@ ₹ 3 per unit

## 5. From the following particulars, calculate:

- (a) Material cost variance
- (b) Material price variance
- (c) Material usage variance
- (d) Material mix variance

Material	SQ	SP ₹	AQ	AP ₹
P	5 kg	2	6 kg	3
Q	10 kg	3	12 kg	5
	<u>15 kg</u>		<u>18 kg</u>	



## **PART**

# **2**

## **Hotel Finance**

- 9. Introduction to Hotel Financial Management
- 10. Financing Decisions
- 11. Investment Decisions
- 12. Dividend Decisions
- 13. Working Capital Management
- 14. Cash Management
- 15. Receivables Management
- 16. Ratio Analysis
- 17. Cash Flow Statement
- 18. Fund Flow Statement





# 9

## Chapter

# Introduction to Hotel Financial Management

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of finance
- Aims and scope of finance function
- Meaning, definition, scope, objectives and function of financial management
- Inter-relationship between investment, finance and dividend decisions
- Meaning, definition and objectives of financial planning
- Principles of sound financial planning and factors affecting financial planning
- Types of financial plans—long term and short term

### MEANING OF FINANCE

Finance is referred to as the art and science of managing money. Virtually all individuals and organizations earn or raise money and spend or invest money. Finance is concerned with the process, institutions, markets, and instruments involved in the transfer of money among and between individuals, businesses, and governments. Finance is essential for every business enterprise to carry out its activities. Finance is the master key which provides access to all the sources for being employed in manufacturing and merchandising activities. It has rightly been said that business requires money to make more money. That is why finance is called the lifeblood of a business enterprise. It is not possible to achieve the objectives of the organization without adequate finance. Therefore, efficient management of business enterprise is required to efficient management of its finance.

## DEFINITIONS OF FINANCE

In the words of **R.C. Osborn**, “The finance function is the process of acquiring and utilizing funds by a business.”

According to **Bonneville and Dewey**, “Financing consists in the raising, providing, managing of all the money, capital or funds of any kind to be used in connection with the business.”

According to **A.S. Kingshott**, “Finance is the common denominator for a vast range of corporate objectives and major part of any corporate plan must be expressed in financial terms.”

According to **Campbell R Harvey**, finance is “a discipline concerned with determining value and making decisions. The finance function allocates resources, including the acquiring, investing, and managing of resources.”

## AIMS OF FINANCE FUNCTION

The primary aim of finance function is to arrange the required amount of funds when required. This function has the following aims:

### Acquiring Sufficient Funds

The main aim of finance function is to assess the financial needs of an enterprise and then find out suitable sources for raising them. The sources should be commensurate with the needs of the business. If funds are needed for longer periods, then long-term sources like share capital, debentures, term loans may be explored. A concern with longer gestation period should rely more on owned funds instead of interest bearing securities because profits may not be there for some years.

### Proper Utilization of Funds

Though arising of funds is important, their effective utilization is more important. Funds should be used in such a way that maximum benefit is derived from them. The returns from their use should be more than their cost. It should be ensured that funds do not remain idle at any point of time. The funds committed to various operations should be effectively utilized. Those projects should be preferred which are beneficial to the business.

### Increasing Profitability

The planning and control of finance function aims at increasing profitability of the concern. It is true that money generates money. To increase profitability, sufficient funds will have to be invested. Finance function should be so planned that the concern neither suffers from inadequacy of funds nor wastes more funds than required. A proper control should also be exercised so that scarce resources are not frittered away on uneconomical operations. The cost of acquiring funds also influences profitability of the business. If the cost of raising funds is more, then profitability will go down. Finance function also requires matching of cost and returns from funds.

### Maximizing Firm's Value

Finance function also aims at maximizing the value of the firm. It is generally said that a concern's value is linked with its profitability. Even though profitability influences firm's value, it is not

all. Besides profits, the types of sources used for raising funds, the cost of funds, the condition of money market, and the demand for products are some other considerations which also influence a firm's value.

## **SCOPE OF FINANCE FUNCTION**

The main objective of financial management is to arrange sufficient finances for meeting short-term and long-term needs. These funds are procured at minimum costs so that profitability of the business is maximized. With these things in mind, a financial manager will have to concentrate on the following areas of finance function:

### **Estimating Financial Requirements**

The first task of a financial manager is to estimate short-term and long-term financial requirements of his business. For this purpose, he will prepare a financial plan for present as well as for future. The amount required for purchasing fixed assets as well as the needs of funds for working capital will have to be ascertained. The estimations should be based on sound financial principles so that neither there are inadequate nor excess funds with the concern. The inadequacy of funds will adversely affect the day-to-day working of the concern whereas excess funds may tempt the management to indulge in extravagant spending or speculative activities.

### **Deciding Capital Structure**

The capital structure refers to the kind and proportion of different securities for raising funds. After deciding about the quantum of funds required, it should be decided which type of securities should be raised. It may be wise to finance fixed assets through long-term debts. Even here, if the gestations period is long, then share capital may be most suitable. Long-term funds should be employed to finance working capital also, if not wholly than partially. Entirely depending upon overdrafts and cash credits for meeting working capital needs may not be suitable. A decision about various sources for funds should be linked to the cost of raising funds. If the cost of raising funds is very high, then such sources may not be useful for long. A decision about the kind of securities to be employed and the proportion in which these should be used is an important decision, which influences the short-term and long-term financial planning of an enterprise.

### **Selecting a Source of Finance**

After preparing a capital structure, an appropriate source of finance is selected. Various sources from which finance may be raised include: share capital, debentures, financial institutions, commercial banks, public deposits, etc. If finances are needed for short periods, then banks, public deposits and financial institutions may be appropriate; on the other hand, if long-term finances are required, then share capital and debentures may be useful. If management does not want to dilute ownership, then debentures should be issued in preference to shares. The need, purpose, objects and cost involved may be the factors influencing the selection of a suitable source of financing.

## MEANING OF FINANCIAL MANAGEMENT

Financial management, as we understand it today, is that managerial activity which is concerned with the planning and controlling of the firm's financial resources. As a separate activity or discipline, it is of recent origin. Finance in the modern business world is the lifeblood of the business economy. We cannot imagine a business without finance because it is the central point of all business activities, no matter whether the business is big or small, government, semi-government, and non-government. The finance function of the management is equally important in profit and non-profit organizations.

Financial management deals with finding out various sources for raising funds for the firm. The sources must be suitable and economical for the needs of the business. The proper use of funds also forms part of financial management. This subject is still developing and has not yet acquired a body of knowledge of its own. In other words, financial management is that part of the management which is concerned with arising of funds in the most economical manner and using them profitably.

Financial management is that specialized function of general management which is related to the procurement of finance and its effective utilization for the achievement of common goal of the organization. It includes each and every aspect of financial activity in the business. Different scholars have defined financial management differently. A few of the definitions are being reproduced below.

According to **Weston and Brigham**, "Financial management is an area of financial decision making, harmonizing individual motives and enterprise goals."

According to **Prof Solomon**, "Financial management is concerned with the efficient use of an important economic resource, namely capital funds."

According to **Howard and Upon**, "Financial management is the application of the planning and control functions to the finance function."

According to **Joseph and Massle**, "Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations."

From the above definitions, it is clear that financial management is that specialized activity which is concerned with the collection or raising of finance and its effective utilization for the attainment of common objectives of the business enterprises. It includes financial planning, financial administration and financial control.

So, financial management guides investment where opportunity is the greatest, producing relatively uniform yardsticks for judging most of a firm's operations and projects. It is a continuous process for achieving an adequate rate of return on investment as this is necessary for survival and attracting new capital. It is an excellent tool by means of which resources can be allocated to various projects, depending upon their importance and pay off capacities. Financial management provides the best guide for future resource allocation by a firm. At present, financial management is the dynamic making of day-to-day financial decisions. In short, financial management is mainly concerned with the proper management of funds.

## SCOPE OF FINANCIAL MANAGEMENT

Financial management, as an academic discipline, has undergone significant changes over the years as regards its scope and coverage. As such, the role of finance manager has also undergone fundamental changes over the years. In order to have a better exposition to these changes, it will be appropriate to study both the traditional approach and the modern approach to the finance function.

Therefore, the scope of financial management is divided into the following categories.

1. Traditional Approach
2. Modern Approach

### Traditional Approach

The traditional approach was popular in the early part of this century, i.e. between 1920 and 1949. Under this approach, the term *corporate finance* was used for financial management. The role of financial management was limited to raising and administering of funds required by the corporate enterprises to meet their financial needs. It covered the following three aspects:

1. Arrangement of funds from financial institutions (raising of loans)
2. Arrangement of funds through financial instruments (raising of funds by issue of shares)
3. Looking after the legal and accounting relationship between a corporation and suppliers of the various sources of funds.

Thus, under the traditional approach, the scope of financial management is confined to mere arising of funds by a company externally, i.e. from outside, the types of funds to be raised, cost of borrowings, the timings of the borrowing and duration of the borrowings, etc. So, according to the traditional approach, more importance is given to collection of funds, not financial decision.

The role of the finance manager was also limited. He was expected to keep accurate financial records, prepare reports on the corporation's status and performance of the corporate enterprise and manage cash in such a way as to meet the bills in time. The term *corporation finance* was used in place of the present term *financial management*.

### Modern Approach

As stated earlier, the traditional approach was popular till 1949. Since 1950, it lost its popularity because of various changes, viz., technological improvements, widened marketing operation, strong corporate structure, healthy business competitions, all these made it imperative for the management to make optimum use of available financial resources for continued survival. On account of these reasons, from 1950 onwards, the popularity of traditional approach had reduced and contributed to the emergence of the modern approach.

Under the modern approach, the financial management has a vast scope or coverage. According to the modern approach, financial management is concerned with not only the raising of funds, but also their wise allocation or application of funds. Thus, in order to carry out his responsibilities, it is the bounden duty of the finance manager to see that the funds available are allocated to different productive uses efficiently and wisely.

Thus, according to the modern concept, financial management is concerned with both acquisitions of funds and allocation. The new approach observes the term financial management in a broader sense. In this sense, the central issue of financial policy is the wise use of funds and the central process involved is a rational matching of advantages of potential uses against the cost of alternative so as to achieve the broad financial goals which an enterprise sets for itself.

## **OBJECTIVES OF FINANCIAL MANAGEMENT**

Financial management is concerned with procurement and use of funds. Its main aim is to use business funds in such a way that the firm's value/earnings are maximized. There are various alternatives available for using business funds. Each alternative course has to be evaluated in detail. The pros and cons of various decisions have to be looked into before making a final selection. Each will have to take into consideration the commercial strategy of the business. Financial management provides a framework for selecting a proper course of action and deciding a viable commercial strategy. The main objectives are:

- Maintenance of liquid assets
- Profit maximization
- Wealth maximization

### **Maintenance of Liquid Assets**

Maintenance of adequate liquid assets in the firm is one of the basic objectives of financial management. The objective of liquidity implies that financial management should ensure that there are adequate cash funds in the hands of the firm at all times to meet its obligations. It may be noted that the liquid assets, maintained in the firm, should be just adequate, i.e. neither too low nor too excessive.

In the context of liquidity, it may be noted that the concept of liquidity conflicts with the concept of profitability. This is because there is an inverse relationship between liquidity and profitability. The more the assets are liquid, the less they are profitable, and vice versa. For instance, if more inventories or raw materials are kept in anticipation of increase in their prices, the profitability consideration may be satisfied, but the liquidity consideration is endangered. Similarly, if a firm increases its sales by following a liberal credit policy, the profitability of the firm may increase, but the liquidity of the firm may decrease. So, a firm should maintain a balance between liquidity and profitability.

### **Profit Maximization**

Maximization of profits is generally regarded as the main objective of a business enterprise. A business firm is a profit seeking organization, i.e. every business organization has a profit motive. So, all the organization is interested in maximizing its earning. Profit is a measure of efficiency of business enterprise. Profit also serves as a protection against risks, which cannot be ensured.

Each company collects its finances by way of issue of shares to the public. Investors in shares purchase these shares in the hope of getting maximum profits from the company as dividend. It is possible only when the company's goal is to earn maximum profits out of its available resources.

If the company fails to distribute higher dividend, the people will not be keen to invest their money in such a firm and persons who have already invested will like to sell their stocks. On the other hand, higher profits are the barometer of its efficiency on all fronts, i.e. production, sales and management.

The main objective of financial management is to safeguard the economic interest of the persons who are directly or indirectly connected with the company, i.e. shareholders, creditors and employees. The all such interested parties must get the maximum return for their contributions. But this is possible only when the company earns higher profits or sufficient profits to discharge its obligations to them. Therefore, the goal of maximization of profits is said to be the best criterion of decision-making.

### **Advantages of Profit Maximization**

1. *It helps in proper utilization of resources:* Profit maximization helps in efficient utilization of available resources. High productivity increases the profitability of an enterprise. So, in order to maximize profit, an organization has to use the resources effectively and efficiently.
2. *It is rational as well as natural objective:* An economic activity is performed by an individual for the purpose of some benefits. The benefits expected in the field of business are measured in terms of profit. When profit earning is the aim of business, then profit maximization should be the natural objective.
3. *It helps in services:* Economic and business conditions do not remain the same at all the times. There may be adverse business conditions like recession, depreciation, cut-throat competition, etc. A business will be able to service in such unfavourable situations only if it has some past earnings to rely upon. That is why a business should try to earn more and more profit when the situation is favourable.
4. *It helps in growth and development of organization:* Profit is the main source of finance for the growth of a business. So, a business should aim at maximization of profits for helping its growth and development.
5. *It helps in maximizing social welfare:* An organization pursuing the profit maximization objective also maximizes social welfare because it ensures efficient allocation of scarce resources of the society.

### **Disadvantages of Profit Maximization**

1. *It ignores timing factor (time value of money):* An enterprise seeking to maximize profit should also take into consideration time factor, because a rupee received today is more valuable than a rupee received after a year or a month.

While selecting the investment projects, the project yielding higher benefits in the earlier period should be selected though its earning capacity may decline after some time.

2. *Profit cannot be ascertained:* It is very difficult to ascertain profit well in advance without knowing all the relevant factors in advance. It is not possible to maximize wealth. The profit maximization concept is not clear. It is confusing as well as ambiguous. It can be interpreted differently by different people.



**3. It ignores uncertainty and risk factor:** An enterprise aiming at maximizing its profits has to bear unexpected risks and uncertainties. Every business is exposed to one or other type of risks.

**4. It neglects social responsibilities of business:** It is contradictory to the concept of social welfare. An organization which is interested in making more and more profit cannot contribute any thing towards the promotion of social welfare. It ignores the interests of the community on the one hand, and those of the workers community and the government on the other.

**5. Lack of confidence:** While estimating future returns, the decision-maker will not be confident of further maximization. So, the goal will not be to maximize profit but to earn a certain rate of profit. Ultimately, firms should be satisfied with whatever profit is earned and should not look for profit maximization.

## **Wealth Maximization**

Wealth maximization means maximization of the wealth of the company, i.e. the net present worth of the company, over the long run. The wealth maximized or created by a company is reflected in the market value of the equity shares of the company. That means, the concept of maximization of wealth also implies the maximization of the market value of the equity shares of the company. So, the concept of maximization of wealth means the maximization of the wealth of the company and the market value of the equity shares. In short, the concept of maximization of wealth implies that the financial action contemplated should be such as would create wealth.

The wealth maximization objective is consistent with the objective of maximizing the owners' economic welfare, i.e. their wealth. The wealth of owners of a company is reflected by the market value of the company's shares. Thus, it implies that the fundamental principle of the company is to maximize the market value of its shares in the long run. The long run means a considerably long period in order to work out a normalized market price. The management can make decision to maximize the value of its shares on the basis of day-to-day fluctuations in the market price. In order to raise the market price of its shares over the short run, the firm may temporarily divert some of its funds to some other accounts or cut some of its expenditure to the minimum at the cost of future profits. This does not reflect the true worth of the share because it will result in the fall of the share price in the market in the long run.

### **Steps for Wealth Maximization**

1. Avoid high levels of risks.
2. Pay dividends.
3. Maintain growth in sales.
4. Discharge social responsibility.
5. Maintain price of equity shares.
6. Government constraints.

### **Advantages of Wealth Maximization**

**1. Time value of money:** The value of money received today is more than the value of same amount of money received after a certain period or tomorrow. In other words, money received in

the future is not as valuable as money received today. The time value of money is referred to as time preference for money.

**2. Quality of benefits:** The quality of benefits depends on the certainty with which benefits are expected to be received in future. The more certain the expected returns, the better quality of benefits and the higher the value. If there is uncertainty in receipt of expected benefit, its value is less.

**3. It is clear and unambiguous:** The wealth maximization criterion is based on the concept of cash flows generated by the decision rather than accounting profit. Cash flow is a precise concept with a definite connotation. Measuring benefits in terms of cash flow avoids ambiguity associated with accounting profits.

**4. It helps in achieving other objectives:** Wealth maximization objective helps in increasing sales, growth of market, face competition and survival.

**5. Regular payment of dividend:** Wealth maximization policy ensures payment of regular dividends, which in turn increases the market value of shares.

### **Disadvantages of Wealth Maximization**

**1. Government restrictions:** Various restrictions are imposed by the government for establishment, expansion, closure, etc. of the business firm. It forces the management to act according to the government restrictions. In such cases, it is not possible to maximize shareholder's wealth.

**2. Reduce the profitability:** The management can ignore its social responsibility, i.e. protecting the interests of consumers, paying fair wages to worker, maintaining proper working conditions, providing educational and physical or medical facilities to the workers and even some social actions in the interest of the shareholders. But this will ultimately reduce the firm's profitability.

**3. Wealth maximization is a prescriptive idea:** The objective is not descriptive of what the firms actually do, but prescriptive.

**4.** The benefit of the society is not considered because wealth maximization is only to shareholders and not to society.

**5.** Most of the shares are held by a few people. Hence, the equality of wealth is not maintained.

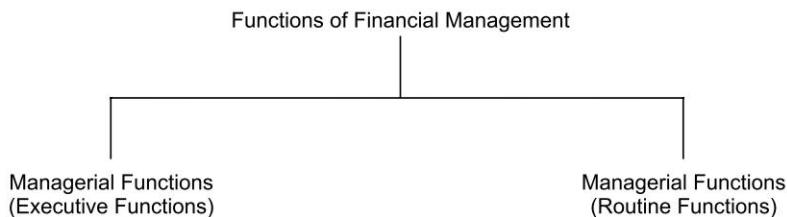
### **Other Objectives**

Other objectives of financial management are:

- (a) To ensure a fair rate of return on investment of shareholders.
- (b) To build up adequate resources for financing growth and expansion.
- (c) To utilize the available financial resources effectively.
- (d) Enforcing financial discipline in the organization in the use of financial resources through coordination of the operations of various divisions in the organization.

## FUNCTION OF FINANCIAL MANAGEMENT

The functions of financial management are shown in Fig. 9.1.



**Figure 9.1** *Function of Financial Management*

### Managerial Functions (Executive Functions)

Management functions require administrative skill in planning, execution and control of financial activities. Executive functions include all those important financial decisions which require specified administrative skill. They are as follows:

#### ***Fund Requirement Decision***

The primary function of financial management is to estimate how much different types of funds are required, i.e. short-term and long-term. Generally, short-term fund is required for working capital whereas long-term fund is required for fixed capital or acquisition of fixed assets.

Usually in the case of new concerns, the estimation of funds required is made by the promoters but in the case of going concerns, the estimation of funds required is made by the chief executive, finance department. A careful estimation has to be made about the total funds required by the enterprise, taking into account both fixed and working capital requirements. This is done by forecasting the physical activities of the enterprise.

#### ***Financing Decision***

In order to meet the requirements of the firm, financial management has to decide, i.e. to take decisions on: When the fund is required? Where to acquire the funds from? How to acquire the funds?

All the business activities require funds and every financial manager faces this problem. The financial manager has to identify the sources from which funds can be raised, how much amount can be raised from each source, and the cost and consequences involved. A proper balance has to be maintained between fixed and non-fixed cost bearing securities.

#### ***Investment Decision***

It is related to deciding how much cash will be invested in fixed assets and how much in current assets, which are normally convertible into cash within a year. Investment in assets is assets management policy. Investment in current assets is called *working capital management*. Similarly, investment in fixed assets is known as *capital budgeting*.

### ***Dividend Decisions***

It involves the determination of the percentage of profits earned by the enterprise which is to be paid to shareholders. While taking decision for distribution of dividend, the financial manager has to take into account the market price of shares, various factors like (a) the trend of earnings, (b) the tax positions of the shareholders, etc. These factors play a very important role in the determination of dividend decision of the enterprise.

### ***Cash Flow and Requirements***

Adequate supply of cash should be made available at the right time for smooth running of the business. Cash inflows depend upon the sales, and cash outflows or cash requirements depend upon the volume of sales. Hence, the financial manager has to decide, how much cash is required to meet the current obligation, so that there would be no idle cash balance in the company. Therefore, the financial manager has to maintain a balance between inflow and outflow of cash to pay his bills in time.

### ***Appraisal of Financial Performance***

It is the duty of the financial manager to check the financial performance of the funds invested in the business enterprise. It requires the respective analysis of the operating period to evaluate the efficiency of the financial planning. An unbiased assessment of the financial performance will be of great value for the business in improving standards, technique and procedure of financial control.

### ***Borrowing Policy Decision***

All organizations plan for the expansion of the business for which they require additional funds. The financial manager has to make necessary arrangements for such funds by borrowing either from commercial banks or financial institutions or by issuing new shares or by floating new debentures.

The financial manager has to decide about the time when the funds are raised, from which sources the funds are to be collected, how long they are needed, cost of raising capital and from which sources they will be repaid. So, ultimately, the financial manager has to take a decision that may carry an ideal debt equity ratio.

### ***Incidental Functions (Routine Functions)***

The financial manager has to perform some incidental or routine functions. These functions do not require any specified administrative skills. Generally, routine functions are performed by clerical or assistant managers at lower levels. These functions are to be performed for the purpose of execution of decisions taken by the executives. They are as follows:

1. To ensure the supply of funds to all parts of the organization. When the fund is provided, it helps in smooth operation of the activities of the organization.
2. To negotiate with bankers, financial institutions and other suppliers of credit. These are the different sources of funds. It is necessary for the company to negotiate with them to obtain funds at the most favourable terms.

3. To safeguard cash balance. Proper supervision of cash receipts and disbursement of cash is necessary to safeguard cash balance.
4. Proper custody and safe keeping of important, valuable papers, documents, securities, insurance policies, etc.
5. Record keeping and reporting.
6. To provide information to the top management on present and prospective financial conditions of the enterprise.
7. To keep track of stock exchange quotations and the behaviour of stock market prices.

## INTERRELATIONSHIP BETWEEN INVESTMENT, FINANCE AND DIVIDEND DECISIONS

All the major functions or decisions—investment function, finance function, and dividend function—are interrelated and interconnected. They are interrelated because the goal of all the functions is one and the same. Their ultimate objective is only one—**achievement of maximization of shareholders' wealth or maximizing the market value of the shares**. All the decisions are also interconnected or interdependent. Let us illustrate both these aspects with an example.

If a firm wants to undertake a project requiring funds, this investment decision cannot be taken in isolation, without considering the availability of finances, which is a finance decision. Both the decisions are interconnected. If the firm allocates more funds for fixed assets, lesser amount would be available for current assets. So, financing decision and liquidity decision are interconnected. The firm has two options to finance the project, either from internal resources or raising funds externally from the market. If the firm decides to meet the total project cost only from internal resources, the profits, otherwise available for distribution in the form of dividend, have to be retained to meet the project cost. Here, the finance decision has influenced the dividend decision.

So, an efficient financial manager takes the optimal decision by considering the implications or impact of all the decisions, together, on the market value of the company's shares. The decision has to be taken considering all the angles simultaneously.

**No Function is Superior:** All the functions are important. The importance of the function depends on the situation of the firm. If a firm has adequate investment opportunities but experiences difficulty in raising funds, then the finance function is superior to the firm at that juncture. It does not mean that investment decision is less important compared to finance decision, always. The essence is, no financial function or decision is superior to others.

## FINANCIAL PLANNING

Planning is necessary for the smooth running of the business. A business cannot be carried on without planning. Planning means deciding in advance what is to be done. It is the primary function and achieves primary position over other functions. It is a continuous and never-ending process. Planning is a pre-determined course of action to achieve or demanding or incorporating desired objectives. It is a mutual process requiring the use of intellectual facilities, foresight and sound judgment. Planning is concerned with developing a finance programme and specifying what and how the financial functions are to be performed.

Planning is done for each functional area of management. Each functional manager plans for his area of management and acts accordingly. The planning of each area should be linked to the objectives of the organization.

Financial management, being one of the branches of the management, also needs planning. Financial planning is necessary for the control of inflow and outflow of cash so that necessary funds may be made available as and when they are required. The highest earnings can be assured only through sound financial plans. So, sound financial planning is necessary to achieve the long-term and the short-term objectives of the firm and to protect the interests of all parties concerned, i.e., firm, creditors, shareholders and public.

### **Meaning of Financial Planning**

Financial planning means deciding in advance the financial activities to be carried on to achieve the basic objectives of the firm. The basic objective of the firm is to get maximum profits out of minimum efforts or to maximize the wealth of the firm in an efficient manner. So, the basic purpose of financial planning is to make sure that adequate funds are raised at minimum cost and that they are used wisely. Thus, planners of financial policies must see that adequate finances are available with the concern when they are required because an inadequate supply of funds will hamper operations and may lead to difficulties. Too much capital, on the other hand, means lower earnings to the unit holders because idle capital will earn nothing. A proper planning is, therefore, necessary for the smooth running of the business on the one hand and to allow a fair return to the shareholders on their contributions, on the other.

According to **J.H. Bonneville**, “The financial plan of a corporation has two fold aspects: it refers not to the capital structure of the corporation, but also to the financial policies which the corporation has adopted or intends to adopt.”

According to **William King**, “Planning is the process of thinking through and making explicit the strategy actions and relationships necessary to accomplish an overall objective.”

### **Objectives of Financial Planning**

#### ***Adequate Funds***

Financial plan should ensure the availability of sufficient funds in order to achieve the goals of the enterprise.

#### ***Minimize the Cost Economy***

The cost of collecting funds should be minimum. It should not be a burden. This can be done by proper equity debt mix.

#### ***Matching of Costs and Risks***

It involves raising the funds in order to protect the interests of the owners.

#### ***Flexibility***

Financial plan should be flexible so that the financial structure may be adjusted as per the changing conditions.

***Simplicity***

Financial plan should be simple so that it can be understood easily. For this purpose, the enterprise should issue fewer securities but not more.

***Long-term Period***

The needs for funds in the near future and over a long period should be considered while selecting the pattern of financing.

***Optimum Use***

Financial plan should provide sufficient funds for genuine purposes. Financial plans should be prepared in such a manner that funds are not insufficient or used lavishly. So, funds should be put to their optimum use.

**Principles (Essentials) of Sound Financial Planning**

The success of a business very much depends upon a financial plan based upon certain basic principle of corporation finance. The essential characteristics of an ideal capital plan may briefly be summarized as follows:

***Simplicity***

An ideal financial plan should be simple and understandable by every person. It should be free from complications and suspicions. In other words, a complicated financial plan creates complications and confusion. The simplicity of financial plan helps the management in procuring the necessary capital.

***Foresight***

While preparing the financial plan, the planners should take into consideration the present and future requirements of funds for the organization. In order to arrive at a sound financial plan, the promoters use foresight in predicting the short-term and long-term financial needs of the company. Vision and foresight is required in planning the scope and scale of operations so that the needs for capital are estimated accurately. Thus, a canon of foresight implies that not only the needs of today but also the needs of tomorrow are considered.

***Flexibility***

Financial plan should be flexible so that it can be adepth according to the changing situations. The flexibility in the financial plan helps the company to introduce necessary changes according to changing business situations. Hence, financial plan should not be rigid.

***Liquidity***

For smooth running of an organization, a reconcilable percentage of current assets should be kept in the form of required cash. While preparing a company's financial plan, it is necessary to pay proper attention to its liquidity requirements. The amount of liquidity funds depends upon the nature and size of the business, its standing goodwill and situation on trade cycles.

### ***Provision for Contingencies***

Financial plan should make adequate provision for funds for meeting the contingencies likely to arise in the future. It may be noted that this principle does not mean that large amount of funds should be kept idle as reserve for unforeseen contingencies. It simply means that while formulating the financial plan, the financial planners would make proper forecasts of the contingencies likely to arise in the future and make adequate provision for funds for meeting the future contingencies.

### ***Economical***

The cost of sources of capital collected should be minimum or economical. The cost of capital raised should not be a burden on the company. The rate of dividend and interest to be paid should be in line with the company's earnings. Similarly, the various expenses relevant to the issue of capital such as underwriting, commission, brokerage, discount, printing, etc. should be minimum.

### ***Optimum Use of Capital***

Effective utilization of capital is an important principle of financial plan. Firms have to maintain equilibrium in working and fixed capital. Surpluses of fixed and working capital should not be used as substitutes for shortages of one another. It causes financial crisis. Capital funds should not be invested in intangible and unproductive assets. So, capital fund should be invested in only productive assets. Thus, intensive or optimum use of available capital increases rate of earning.

### ***Period of Finance***

Usually, long-term funds should be raised by the issue of equity shares. But medium and short-term funds should be raised through redeemable preference shares and debentures and borrowing from financial institutions.

### ***Factors Affecting Financial Planning***

Financial planning is the first and foremost function of financial management. The main purposes of financial planning are procurement of sufficient amount of capital at minimum cost and establishment of effective coordination between costs and risks. A sound financial plan must consider the long-term and short-term financial needs of the company and the various sources of raising funds. The following points must be considered in formulating a financial plan:

#### ***Nature of Industry***

Different industries require funds for different purposes. While preparing financial plan, variable factors affect the size and structure of financial requirements.

Hence, financial planning is directly related to the nature of industry. For example, capital-intensive industries require huge amount of capital whereas labour-intensive industries require relatively small amount of capital. Stability and regularity in earnings of the industry will affect the quantum of capital and sources of finance of a company. These industries having stability and regularity in earnings can get the funds easily from the market.

#### ***Goodwill of the Enterprise***

Goodwill of the enterprise, credit rating in the market, attitude of the management, and past performance are some of the factors to be considered while preparing financial plan. Large sized



and old industries with established goodwill do not face difficulty in raising the required amount of capital. But newly established industries face a lot of difficulties in raising the required amount of capital.

### ***Future Plan***

While preparing financial plan, plans for expansion and diversification in future are to be taken into consideration. Expansion in future will require flexible financial plan. The sources of funds will be provided without difficulty for future expansion.

### ***Availability of Source***

There are different sources of funds available to a firm. So, while selecting the sources of funds, the firm has to consider the advantages and disadvantages of every source under consideration. The sources selected should be able to provide sufficient and regular funds to meet the needs at different periods.

### ***General Economic Conditions***

The existing economic conditions at the national and international levels will also affect the financial planning. Such economic conditions should be considered before taking any decisions regarding the sources of funds.

### ***Government Control***

Government policies relating to the issue of shares, debentures, distribution of dividend, rate of interest and industrial policy are important factors to be taken into consideration while formulating the financial plan.

### ***Amount of Risk***

The amount of risk involved in the industry influences the financial plan. For instance, an industry, which is subject to risks and uncertainties, will depend more on ownership funds, whereas an industry, which is subject to lesser amount of risks and uncertainties, may depend upon debt finance (i.e. borrowed funds).

### ***Attitude of Management***

The attitude of the management also influences financial planning. For instance, if the management wants to have financial control over the industry, it will not like to raise finance through the issue of equity shares. It will prefer debt financing (i.e. borrowing of funds) and ploughing back of profits.

### ***Need for Flexibility***

The need for flexibility is another factor influencing the financial plan. It may be noted that flexibility in financial plan is quite essential. If there is no flexibility in the financial plan, it will be difficult to carry on expansion, modernization and diversification programmes due to lack of funds.

### **Magnitude of External Capital Requirements**

The magnitude of external capital requirements is one of the factors influencing the financial plan. It is advisable for a concern to finance expansion, modernization and diversification programmes through internal sources, such as ploughing back of profits, and short-term finances may be obtained through external sources.

### **Types of Financial Plans**

From the point of view of the period of coverage, financial plans may be divided into two types; viz. long-term and short-term.

#### **Long-term Financial Plan**

It is concerned with the formulation of long-term financial goals of the enterprise and the determination of the ways and means of achieving those goals. Long-term financial plans attempt to anticipate, analyse and make decisions about basic financial problems and issues, which are beyond the present horizon of the enterprise. The preparation of long-term financial plan is a very difficult task. But it is quite essential in the competitive business world.

Long-term financial plans are, generally, prepared on the basis of long-term financial forecast, and the long-term financial forecasts are prepared by relating the items of profit and loss account and balance sheet to sales.

#### **Short-term Financial Plan**

It is the financial plan which covers a period of 1 year or less. The financial plan is concerned with the planning or determination of short-term financial activities to accomplish long-term financial objectives. As a short-term financial plan is intended to achieve long-term financial objectives, it has to be consistent with long-range financial plan. Short-term financial plan is more active oriented more detailed specific and quantitative. The preparation of short-term financial plan is relatively easier. Small companies generally choose short-term financial plan.

### **Objective Type Questions**

*State the following statements are true or false:*

- (a) The traditional approach confines finance function only to raising of funds.
- (b) The main objective of financial management is maximization of profit.
- (c) The finance manager is only concerned with maintaining liquidity and not profitability.
- (d) Investment decisions are outside the purview of financial management.
- (e) Financial decision involves investments, financing and sales decisions.

### **Review Questions**

1. Define financial management.
2. Define finance function.
3. State any two aims of finance function.

4. State any two goals of financial management.
5. State any two advantages of wealth maximization.
6. Name the financial decisions.
7. What is dividend decision?
8. What is financial plan?
9. State any two objectives of financial plan.
10. Name any two principles of financial planning.
11. List the aims of finance functions.
12. What are the steps for wealth maximization?
13. Explain the long-term and short-term financial plan.
14. Explain the goals of financial management.
15. State the objectives of sound financial planning.
16. Explain the scope of financial management.
17. What is financial plan? Briefly explain the factors affecting financial plan.
18. Define financial management. Explain the goals of financial management.
19. Discuss objectives and principles of financial planning.
20. What is financial management? Briefly explain the functions of financial management.

# 10

## Chapter

# Financing Decisions

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of capital structure
- Forms/patterns/components of capital structure
- Essential features of a sound capital structure
- Factors determining the capital structures
- Meaning of leverages and different types of leverages

### INTRODUCTION

Once a firm has taken the investment decision and committed itself to new investment, it must decide the best means of financing these commitments. Since firms regularly make new investments, the needs for financing and financial decisions is always there. Hence, a firm will be continuously planning for new financial needs. The financing decision is not only concerned with how best to finance new assets, but also with the best overall mix of financing for the firm.

Provision of funds required at the proper time is one of the primary tasks of the finance manager. Every business activity requires funds and hence every financial manager is confronted with this problem. He has to identify the sources from which the funds can be raised, the amount that can be raised from each source, and the cost and other consequences involved.

Financing decisions relate to the determination of the amount of long-term finance required and the sources from which such finance is to be raised. He has to determine the optimum capital structure keeping in view the cost and risk associated with each source of finance. It includes the methods and techniques of determining the amount of long-term funds required, their sources and optimum capital structure.

## CAPITAL STRUCTURE

According to **John Hampton**, “Capital structure is the composition of debt and equity securities that comprise a firm’s financing of its assets.”

In the words of **Weston and Brigham**, “Capital structure is the permanent financing of the firm represented by long term debt, preferred stock and net worth.”

According to **Husband and Dockery**, “Capitalization embraces the composition or the character of the structures as well as the amount.”

### Forms/Patterns/Components of Capital Structure

1. Equity shares only
2. Equity and preference shares
3. Equity shares and debentures
4. Equity shares, preference shares and debentures

### Essential Features of a Sound Capital Structure

1. Maximum possible use of leverage.
2. The capital structure should be flexible.
3. Undue financial/business risk with the increase of debt should be avoided.
4. The use of debt should be within the capacity of a firm. The firm should be in a position to meet its obligations in paying the loan and interest charges as and when due.
5. It should involve minimum possible risk of loss of control.
6. It must avoid undue restrictions in agreement of debt.

### Factors Determining Capital Structures

The capital structure has to be planned initially at the time a company is promoted. The initial capital structure should be designed very carefully. The management of the company should set a target capital structure and the subsequent financing decisions should be made with a view to achieving the target capital structure. The financial manager has also to deal with an existing capital structure. The company needs funds to finance its activities continuously. Every time when the funds have to be procured, the financial manager weighs the pros and cons of various sources of finance and selects most advantageous sources keeping in view the target capital structure. Thus, the capital structure decision is a continuous one and has to be taken whenever a firm needs additional finances.

The following are the factors that determine the capital structure of a firm.

#### **Trading on Equity**

A company may raise funds either by issue of shares or by debentures. Debentures carry a fixed rate of interest and this interest has to be paid irrespective of profits. Of course, preference shareholders are also entitled to a fixed rate of dividend, but the payment of dividend depends upon the profitability of the company.

In other words, trading on equity means an arrangement under which a company employs (invested) borrowed funds like debentures, carrying fixed rate of dividend and ultimately increases the return on equity shares.

Trading on equity increases the return on investment of equity shareholders at the cost of funds supplied by the debenture holders and preference shareholders. Trading on equity is not possible when only equity shares are issued.

### ***Nature of Business***

Public utility concerns that enjoy monopoly market for their product and have stable earnings can easily raise capital by the issue of preference shares and debentures. On the contrary, companies engaged in manufacturing and selling the products under competitive environment and changing market conditions have to collect funds by issuing equity shares only.

### ***Size of the Company***

Large-scale organizations having good financial position can easily collect funds by issuing preference share, debentures as well as equity shares. However, small-scale companies which do not have sound financial base find it difficult to raise funds by issue of debentures and they have to issue equity shares only, as investors may not be interested in buying the debentures issued by small-scale undertakings.

### ***Purpose of Finance***

If the funds are required for productive purposes such as setting up of a new factory or new machine or new business, companies can collect the funds by the issue of equity shares or preference shares or debentures. On the other hand, if the funds are required for non-productive purposes such as promoting art and culture or employee welfare programmes, in such cases it is not possible to issue debentures and preference shares. Only by issuing equity shares can the company collect funds.

### ***Legal Requirements***

The promoters of the company have also to keep in view the legal requirements while deciding about the capital structure of the company. This is particularly true in the case of banking companies which are not allowed to issue any other type of security for raising funds except equity share capital on account of the Banking Regulation Act.

### ***Retaining Control***

The capital structure of a company is also affected by the extent to which the promoters/existing management of the company desires to maintain control over the affairs of the company. The preference shareholders and debenture holders have not much say in the management of the company. It is necessary, therefore, for the promoters to own majority of the equity share capital in order to exercise effective control over the affairs of the company. The promoters of the company, at the same time, need extra funds. They will, therefore, prefer preference shares or debentures over equity shares so long as they help them in retaining control over the company.

### ***Period of Finance***

The period for which finance is required also affects the determination of capital structure of companies. In case funds are required, say for 8 to 10 years, it will be appropriate to raise them by issue of debentures rather than by issue of shares. This is because in case funds are raised by issue

of shares, their repayment after 8 to 10 years (when they are not required) will be subject to legal complications. However, if the funds are required more or less permanently, it will be appropriate to arise them by issue of equity shares.

### ***Market Sentiments***

The market sentiments also decide the capital structure of the company. There are periods when people want to have absolute safety. In such cases, it will be appropriate to raise funds by issue of debentures. At other periods, people may be interested in earning high speculative incomes; at such times, it will be appropriate to raise funds by issue of equity shares. Thus, if a company wants to raise sufficient funds, it must take into account market sentiments; otherwise, its issue may not be successful.

### ***Need of Investors***

An ideal capital structure is that which suits the needs of different types of investors having varying financial status and varying psychologies. Some investors who prefer security of investments and stability of income usually go in for debentures. Preference shares will be preferred by those who want a higher and stable income with enough safety of investment. Equity share will be taken up by those who are ready to take risks for higher income and capital appreciation. Those who want to acquire control over the affairs of the company like equity shares.

### ***Cost of Financing***

The cost of financing has an important influence on the choice of securities as the funds can be collected at varying costs through different kinds of securities. In raising capital, companies must ensure the lowest cost in terms of interest, dividend and maintain relationship of earnings to the price of the shares. Generally, a company would raise funds by borrowings when interest rates are low and by issuing equity shares when the relationship of earning and price is high. Raising the entire capital by issue of shares of one class only increases the cost in terms of dividend. Debentures can always be issued at cheaper rates, for the buyer of bonds looks more for safety of investment and regularity of income than the size of the income.

### ***Flexibility***

The capital structure of a firm should be flexible, i.e., it should be such as to be capable of being adjusted according to the needs of the changing conditions. It should be possible to raise additional funds, whenever the need be, without much of difficulty and delay. A firm should arrange its capital structure in such a manner that it can substitute one form of financing by another. Redeemable preference shares and convertible debentures may be preferred on account of flexibility. Preference shares and debentures, which can be redeemed at the discretion of the firm, offer the highest flexibility in the capital structure.

### ***Government Policy***

It is also an important factor in planning the company's capital structure; for example, a change in the lending policy of financial institutions may mean a complete change in the financial pattern. Similarly, by virtue of the Securities and Exchange Board of India (SEBI) Act and the rules made

thereunder, the SEBI can also considerably affect the capital issue policies of various companies. Besides this, the monetary and fiscal policies of the government also affect the capital structure decision.

### ***Provision for the Future***

While planning capital structure, the provision for future should also be kept in view. It would always be safe to keep the best securities in one installment. In the words of Gerstenberg, managers of corporate financing operations must always think of rainy days or the emergencies. The general rule is to keep your best security or some of your best securities till the last.

## **LEVERAGES**

The capital structure decision is of tremendous significance for the management since it influences the debt equity mix (i.e. the proportion between the borrowed funds and the shareholders' funds) of the company, which ultimately affects shareholders' return and risk. In case the borrowed funds are more as compared to the owner's funds, it results in increase in shareholders' earnings, together with increase in their risk. This is because the cost of borrowed funds is less than that of the shareholders' funds on account of the cost of borrowed funds being allowable as a deduction for income-tax purposes. But, at the same time, borrowed funds carry a fixed interest, which has to be paid whether the company is earning profits or not. Thus, the risk of the shareholders increases in case there is a high proportion of borrowed funds in the total capital structure of the company. In a situation where the proportion of the shareholders' funds is more than the proportion of the borrowed funds, the return as well as the risk of the shareholders will be much less. Thus, the debt-equity mix in the capital structure of a company has a significant effect on the shareholders' earnings and risk. The concept of leverage is helpful in examining the effect of debt-equity mix on the shareholders' earnings and risk.

### **Meaning of Coverage**

The term 'leverage' is generally used to utilize the fixed cost assets or funds to increase the return of the owners of the firm. Every firm tries to earn more for its owner and it can achieve this objective by using the fixed cost funds, which are generally available at lower costs. The fixed cost is considered to be a support on which a lever moves. Leverage is always associated with the risk of uncertainty of returns but, at the same time, it increases the size of the possible return. In other words, increasing leverage increases the uncertainty of returns and increases the size of the return and, at the same time, increases the risk. Risk refers to the degree of uncertainty associated with the firm's ability to pay its fixed cost or paying a fixed return for employing resources or funds. Thus, leverage calculations are greatly related with the change in the sales volume or the levels of income (i.e. operating profits or profits before tax).

Since fixed cost or return has to be paid or incurred irrespective of the volume of output or sales, the size of such cost or return has considerable influence over the amount of profits available for the shareholders. When the volume of sales changes, leverage helps in quantifying such influence. It may, therefore, be defined as relative change in profits due to a change in sales. A high degree



of leverage implies that there will be a large change in profits due to a relatively small change in sales and vice versa. Thus, the higher is the leverage, the higher is the risk and the higher is the expected return.

### Types of Leverages

Leverages are of three types: (i) Operating leverage, (ii) Financial leverage, and (iii) Combined leverage.

#### Operating Leverage

Operating leverage may be defined as the ability of a firm to use fixed operating costs to increase the effect of changes in sales on its profits. It exists when a change in sales revenue produces more than proportionate change in the operating profit (i.e. earning before interest and taxes).

Operating leverages signify the use of assets with fixed cost in the anticipation of earning sales revenues more than sufficient to meet the total cost including the fixed cost. In short, change in the profit due to change in the sales is known as *operating leverage*. Operating leverage can be calculated by the following formula:

$$\begin{aligned}\text{Operating Leverage} &= \frac{\text{Contribution}}{\text{Operating profit}} \quad \text{or} \quad \frac{\text{Sale} - \text{Variable cost}}{\text{Contribution} - \text{Fixed cost}} \\ &= \frac{\text{Marginal contribution}}{\text{EBIT}}\end{aligned}$$

Operating leverage may be favourable or unfavourable. In case the contribution exceeds the fixed cost, there is favourable operating leverage. In a reverse case, the operating leverage will be termed a unfavourable.

How to calculate operating profit

Sales Value	xxxx
Less: Variable cost	xxx
Contribution	xxxx
Less: Fixed cost	xxx
Operating profit (Earning before interest and tax or EBIT)	xxxx

**Degree of operating leverage:** The degree of operating leverage may be defined as percentage change in the profits resulting from a percentage change in the sales. It may be put in the form of following formula:

$$\text{Degree of operating leverage} = \frac{\text{Percentage change in profits}}{\text{Percentage change in sales}}$$

## Financial Leverage

Financial leverage is also known as *trading on equity*. In other words, the effect on earnings by the use of fixed cost securities (preference shares and debentures) is called *financial leverage*. It is the ratio of the net rate of return on shareholders' equity and the net rate of return on the total capitalization. In the words of J. E. Walter, "financial leverage may be defined as percentage return on equity to the percentage return on capitalization."

Financial leverage refers to the use of fixed charges, securities (such as preference share, capital and debentures) in the capitalization of a company to produce more gains for the equity shareholders. In other words, financial leverage is the mix of long-term debts and preference share capital and equity so that earning per share is improved.

$$\text{Financial leverage} = \frac{\text{Operating leverage}}{\text{Profit before tax (PBT)}}$$

**Favourable and unfavourable financial leverage:** Financial leverage may be favourable or unfavourable, depending upon whether the earnings made by the use of fixed interest or dividend-bearing securities exceed or not the explicit fixed cost; the firm has to pay for the employment of such funds. The leverage will be considered to be favourable so long as the firm earns more on assets purchased with the funds than the fixed costs of their use. Unfavourable or negative leverage occurs when the firm does not earn as much as the funds cost.

**Degree of financial leverage:** Degree of financial leverage may be defined as the percentage change in profit as a result of percentage change in operating profit.

$$\text{Financial Leverage} = \frac{\text{Earnings before interest and tax}}{\text{Earnings before tax}} \quad \text{or} \quad \frac{\text{Operating profit}}{\text{EBT or PBT}}$$

## Combined Leverage

Combined leverage is the combination of operating leverage and financial leverage. Combined leverage expresses the effect of a change in sales over change in the taxable profits of the company.

Combined leverage, thus, expresses the relationship between the revenue on account of sales (i.e. contribution or sales less variable cost) and the taxable income. It helps in finding out the resulting percentage change in the taxable income on account of percentage change in sales. This can be computed as follows:

$$\text{Combined leverage} = \text{Operating leverage} \times \text{Financial leverage}$$

**Degree of combined leverage:** The degree of combined leverage is the percentage change in contribution to percentage change in profits.

$$\text{Degree of combined leverage} = \frac{\text{Percentage change in contribution}}{\text{Percentage change in profit}}$$

Figure 10.1 shows a format of table for leverage calculation.

Table for leverage calculation	
Particulars	Amount
Sales	xxxx
Less: Variable cost	xxxx
Contribution	xxxx
Less: Fixed cost	xxxx
Earning before interest and tax (Operating profit or EBIT)	xxxx
Less: Interest	xxxx
Earning before tax (EBT)	xxxx
Less: Taxes	xxxx
Earning after tax (EAT)	xxxx
Less: Preference shareholder or Dividend	xxxx
Earnings available for equity shareholders	xxxx

**Figure 10.1** Format of Table for Leverage Calculation

## ILLUSTRATIONS

1. From the following data, calculate operating leverage:

Sales—₹ 4000, Variable cost—₹ 2000, Fixed cost—₹ 600

**Solution:**

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{Operating profit}} = \frac{2000}{1400} = 1.43 \text{ times}$$

**Interpretation:** Since the contribution is more than the operating profit, the operating leverage is favourable.

2. Annachi Hotels Ltd. provides the following information: Sales 75,000 at ₹ 15 each, Variable cost at ₹ 5 each, Fixed cost at ₹ 2,50,000.  
Calculate operating leverage.

**Solution:**

**Working Note:**

Sales (75,000 × 15)	11,25,000
Less: Variable cost (75,000 × 5)	3,75,000
Contribution	7,50,000
Less: Fixed cost	2,50,000
Operating profit or EBIT	5,00,000

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{Operating profit}} = \frac{7,50,000}{5,00,000} = 1.5 \text{ times}$$

**Interpretation:** Since the contribution is more than the operating profit, the operating leverage is favourable.

3. The installed capacity of a factory is 600 units and the actual capacity used is 400 units. The selling price per unit is ₹ 10, and variable cost ₹ 6 per unit. Calculate the operating leverage in each of the following three situations:

(a) When fixed cost ₹ 400. (b) When fixed costs ₹ 1000 (c) When fixed cost ₹ 1200

**Solution:**

Particulars	Situation (a)	Situation (b)	Situation (c)
Sales (400 × 10)	4000	4000	4000
Less: Variable cost (400 × 6)	2400	2400	2400
Contribution	1600	1600	1600
Less: Fixed cost	400	1000	1200
Operating Profit	1200	600	400

$$\begin{aligned} \text{Operating leverage} &= \frac{\text{Contribution}}{\text{Operating profit}} && \frac{1600}{1200} && \frac{1600}{600} && \frac{1600}{400} \\ &&& = 1.33 \text{ times} && = 2.67 \text{ times} && = 4 \text{ times} \end{aligned}$$

**Interpretation:** When we compare all the three situations, situation (c) is most favourable as the contribution is 4 times higher than the operating profit.

4. A restaurant has a choice of the following three financial plans. You are required to calculate the financial leverage in each case.

Particulars	A	B	C
Equity capital	25,000	15,000	45,000
Debt	25,000	45,000	10,000
Operating profit	5000	5000	5000

**Solution:**

Calculation of financial leverage

Particulars	A	B	C
Operating profit (EBIT)	5000	5000	5000

*Contd.*

Less: Interest on debt at 10%	2500	4500	1000
Earning/profit before tax	2500	500	4000
Operating profit/Profit before tax	5000	5000	5000
	2500	500	4000
Financial leverage	2 times	10 times	1.25 times

**Interpretation:** When we compare all the three situations, situation B is most favourable as the operating profit is 10 times higher than the profit after tax.

5. The capital structure of a company consists of the following:

10% Preference share capital	₹ 1,00,000
Equity share capital (₹ 10 share)	₹ 1,00,000

The amount of operating profit is ₹ 60,000. The company is in 50% tax.

You are required to calculate the financial leverage of the company. What would be the new financial leverage if the operating profit increases to ₹ 90,000?

**Solution:**

Calculation of the present financial leverage

Operating profit	60,000
Less: Preference dividend (before tax)	20,000
(1,00,000 + 1,00,000)	
Earning before tax	<u>40,000</u>

$$\text{Present financial leverage} = \frac{\text{Operating profit}}{\text{Earning before tax}} = \frac{60,000}{40,000} = 1.5 \text{ times}$$

**New financial leverage:**

Operating profit	90,000
Less: Preference dividend (before tax)	20,000
(1,00,000 + 1,00,000)	
Earning before tax	<u>70,000</u>

$$\text{New financial leverage} = \frac{\text{Operating profit}}{\text{Earning before tax}} = \frac{90,000}{70,000} = 1.29 \text{ times}$$

**Interpretation:** When we compare the present financial leverage with the new financial leverage, the present financial leverage is more favourable than the new financial leverage as the operating profit is 1.5 times more than the earnings before tax in the present situation whereas it is 1.29 times in the new situation.

6. A hotel has sales of ₹ 1,00,000. The variable costs are 40% of the sales while the fixed operating costs amount to ₹ 30,000. The amount of interest on long-term debt is ₹ 10,000. You are required to calculate the combined leverage.

**Solution:**

Sales	1,00,000
Less: Variable cost (40% on 1,00,000)	40,000
Contribution	60,000
Less: Fixed cost	30,000
EBIT	30,000
Less: Interest	10,000
EBT	20,000

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{Earning before tax}} = \frac{60,000}{20,000} = 3 \text{ times}$$

**Interpretation:** The contribution is 3 times higher than the earning before tax, so the combined leverage is favourable.

7. Calculate the operating leverage, financial leverage, combined leverage from the following information: Sales—1,00,000, Variable cost—50,000, Fixed cost—30,000, Interest—10,000.

**Solution:**

Sales	1,00,000
Less: Variable cost	50,000
Contribution	50,000
Less: Fixed cost	30,000
EBIT	20,000
Less: Interest	10,000
EBT	10,000

$$\text{Operating} = \frac{\text{Contribution}}{\text{Operating profit}} = \frac{50,000}{20,000} = 2.5 \text{ times}$$

$$\text{Financial leverage} = \frac{\text{Operating profit}}{\text{Earning before tax}} = \frac{20,000}{10,000} = 2 \text{ times}$$

$$\begin{aligned} \text{Combined leverage} &= \text{Operating leverage} \times \text{Financial leverage} \\ &= 2.5 \times 2 = 5 \text{ times} \end{aligned}$$

**Interpretation:**

1. The operating leverage is favourable as the contribution is 2.5 times more than the operating profit.
  2. The financial leverage is favourable as the operating profit is 2 times more than the earning before tax.
  3. The combined leverage is favourable as the contribution is 5 times more than the earning before tax.
8. Calculate operating, financial and combined leverage under situations 1 and 2 and financial plan A and B from the following information relating to the operation and capital structure of a hotel. What are the combinations as operating and financial leverage which give highest and least value?

Installed capacity	3000 units
Annual production and sales	50% of installed capacity
Selling price per unit	₹ 30
Variable cost per unit	₹ 15
Fixed cost: Situation 1	₹ 6000
2	₹ 7500

**Capital Structure:**

	Financial Plan	
	A	B
Equity capital	7500	22,500
Debt at 10%	22,500	7500
	<u>30,000</u>	<u>30,000</u>

**Solution:**

**Working Note:** Actual production and sales 50% of 3000 units = 1500 units

**Calculation of Leverages**

Particulars	Financial plan			
	A		B	
	Situation 1	Situation 2	Situation 1	Situation 2
Sales (1500 × 30)	45,000	45,000	45,000	45,000
Less: Variable cost (1500 × 15)	22,500	22,500	22,500	22,500
Contribution	22,500	22,500	22,500	22,500
Less: Fixed cost	6000	7500	6000	7500

*Contd.*

Earning before Interest & Taxes (EBIT)	16,500	15,000	16,500	15,000
Less: Interest on debt at 10%	2250	2250	750	750
Earning before tax (EBT)	14,250	12,750	15,750	14,250
<b>Operating leverage</b> = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{22,500}{16,500}$	$\frac{22,500}{15,000}$	$\frac{22,500}{15,750}$	$\frac{22,500}{14,250}$
	<b>1.36 times</b>	<b>1.5 times</b>	<b>1.36 times</b>	<b>1.5 times</b>
<b>Financial leverage</b> = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{16,500}{14,250}$	$\frac{15,000}{12,750}$	$\frac{16,500}{15,750}$	$\frac{15,000}{14,250}$
	<b>1.15 times</b>	<b>1.17 times</b>	<b>1.04 times</b>	<b>1.05 times</b>
Combined leverage = O L × F L	1.36 × 1.15	1.5 × 1.17	1.36 × 1.04	1.5 × 1.03
	<b>1.56 times</b>	<b>1.75 times</b>	<b>1.42 times</b>	<b>1.54 times</b>

### Earning Per Share (EPS)

$$\text{EPS} = \frac{\text{Amount available for equity shareholders}}{\text{Number of equity shares}} \quad \text{or} \quad \frac{\text{Market price per shares}}{\text{Price earning rate}}$$

### Interpretation:

1. The operating leverage in the case of financial plans A and B, situation 2 is more favourable than situation 1 as the contribution is 1.5 times more than the operating profit.
  2. The financial leverage in the case of financial plan A, situation 2 is more favourable than situation 1 as the operating profit is 1.17 times more than the earning before tax.
  3. The financial leverage in the case of financial plan B, situation 2 is more favourable than situation 1 as the operating profit is 1.05 times more than the earning before tax.
  4. The combine leverage in the case of financial plan A, situation 2 is more favourable than situation 1 as the contribution is 1.75 times more than the earning before tax.
  5. The combined leverage in the case of financial plan B, situation 2 is more favourable than situation 1 as the contribution is 1.54 times more than the earning before tax.
9. Nagarjuna Hotels is considering two financial plans with a view to examining their impact on earnings per share (EPS). The total funds required for investment in assets are ₹ 5,00,000.

Particulars	Financial plan	
	Plan 1	Plan 2
Debt (Interest at 10% P A)	4,00,000	1,00,000
Equity shares (₹ 10 each)	1,00,000	4,00,000

Contd.



Total finances required	5,00,000	5,00,000
Number of equity shares	10,000	40,000

The earnings before interest and tax are assumed as ₹ 50,000, ₹ 75,000, and ₹ 1,25,000. The rate of tax is taken at 50%.

**Solution:**

**When EBIT is ₹ 50,000**

<i>Particulars</i>	<i>Plan 1</i>	<i>Plan 2</i>
Earning before interest and tax (EBIT)	50,000	50,000
Less: Interest on debt	40,000	10,000
Earning before tax (EBT)	10,000	40,000
Less: Tax at 50%	5000	20,000
Amount available for equity shares (EAT)	5000	20,000
Number of equity shares	10,000 shares	40,000 shares
EPS = Amount available for equity shareholders/Number of equity shares	$\frac{5000}{10,000}$	$\frac{20,000}{40,000}$
EPS	0.50 paisa	0.50 paisa

**When EBIT is ₹ 75,000**

<i>Particulars</i>	<i>Plan 1</i>	<i>Plan 2</i>
Earning before interest and tax (EBIT)	75,000	75,000
Less: Interest on debt	40,000	10,000
Earning before tax (EBT)	35,000	65,000
Less: Tax at 50%	17,500	32,500
Amount available for equity shares (EAT)	17,500	32,500
Number of equity shares	10,000 shares	40,000 shares
EPS = Amount available for equity share holders/Number of equity shares	$\frac{17,500}{10,000}$	$\frac{32,500}{40,000}$
EPS	₹ 1.75 paisa	₹ 0.81 paisa

**When EBIT is ₹ 1,25,000**

<i>Particulars</i>	<i>Plan 1</i>	<i>Plan 2</i>
Earning before interest and tax (EBIT)	1,25,000	1,25,000
<i>Less:</i> Interest on debt	40,000	10,000
Earning before tax (EBT)	85,000	1,15,000
<i>Less:</i> Tax at 50%	42,500	57,500
Amount available for equity share (EAT)	42,500	57,500
Number of equity shares	10,000 shares	40,000 shares
EPS = Amount available for equity share holders/Number of equity shares	$\frac{42,500}{10,000}$	$\frac{57,500}{40,000}$
EPS	₹ 4.50 paisa	₹ 1.44 paisa

**Interpretation:**

1. When the EBIT was ₹ 50,000 the EPS for Plan 1 and Plan 2 were equal (₹ 0.50).
2. When the EBIT increased to ₹ 75,000, the plan 1 is more favourable as the EPS of Plan 1 is ₹ 1.75 as compared to Plan 2 ₹ 0.81.
3. When the EBIT increased to ₹ 1,25,000 Plan 1 is more favourable as the EPS of Plan 1 ₹ 4.50 as compared to Plan 2 ₹ 1.44.

10. Annachi Restaurant company has the following capital structure:

5000 Equity shares of ₹ 10 each	₹ 50,000
1000 10% Preference shares of ₹ 100 each	₹ 1,00,000
1000 10% Debentures of ₹ 100 each	₹ 1,00,000

Calculate the EPS for each of the following levers of EBIT: ₹ 50,000, ₹ 30,000, ₹ 70,000. The company pays 50% tax. Calculate also the financial leverage taking EBIT level.

**Solution:****Calculation of EPS and Financial Leverage**

<i>Particulars</i>	<i>I</i>	<i>II</i>	<i>III</i>
Operating Profit (EBIT)	50,000	30,000	70,000
<i>Less:</i> Interest on debentures (10%)	10,000	10,000	10,000
Earning before interest and tax (EBT)	40,000	20,000	60,000
<i>Less:</i> Tax 50%	20,000	10,000	30,000
Earning before tax (EAT)	20,000	10,000	30,000

*Contd.*

Less: Dividend on Pref. share (10%)	10,000	10,000	10,000
Amount available for equity shareholder	10,000	–	20,000
EPS = Amount available for equity share holders/Number of equity shares	$\frac{10,000}{5000}$		$\frac{20,000}{5000}$
EPS	₹ 2		₹ 4
Financial Leverage = $\frac{\text{Earning before interest and tax}}{\text{Earnings before tax}}$	$\frac{50,000}{40,000}$	$\frac{30,000}{20,000}$	$\frac{70,000}{60,000}$
	₹ 1.25	₹ 1.5	₹ 1.16

**Interpretation:**

1. The situation where EBIT is ₹ 70,000 is more favourable when we compare the EPS of other two situations. In the case where the EBIT is ₹ 30,000, there is no amount left for equity shareholders. In the case of EBIT ₹ 50,000, the EPS is down by half than when the EBIT is ₹ 70,000.
  2. When we compare the financial leverages, the situation where the EBIT is the lowest (i.e. ₹ 30,000) has more favourable leverage, which means the earning before interest and tax is 1.5 times more than the earning before tax.
11. Annapoorna Hotels Ltd. has equity share capital of ₹ 50,00,000, divided into shares of ₹ 100 each. It wishes to raise further ₹ 30,00,000 for expansion cum installation plans. The company plans the following schemes:
- (a) All common stock.
  - (b) ₹ 5,00,000 in common stock and ₹ 25,00,000 in debt at 10% p.a.
  - (c) ₹ 5,00,000 in common stock and ₹ 25,00,000 in preference share capital with the rate of dividend at 8%

The company's existing earnings before interest and taxes are ₹ 16,00,000. The corporate tax is 50%. Determine the earnings per share in each plan and comment on the implication of financial leverage.

**Solution:****Calculation of EPS**

Particulars	Expansion Plan ₹ 30,00,000		
	A	B	C
	50,000 Eq. + 30,000 Eq.	50,000 Eq. + 5000 Eq 10% debt	50,000 Eq. + 5000 Eq 8% pref share
Operating profit (EBIT)	16,00,000	16,00,000	16,00,000

Contd.

Less: Interest on debentures (10% on 25,00,000)	—	2,50,000	—
EBT	16,00,000	13,50,000	16,00,000
Less: Tax 50%	8,00,000	6,75,000	8,00,000
EAT	8,00,000	6,75,000	8,00,000
Less: Preference dividend (8% on 25,00,000)	—	—	2,00,000
Amount available for equity shareholder	8,00,000	6,75,000	6,00,000
No. of equity shares	80,000	55,000	55,000
EPS = Amount available for equity share holders/ Number of equity shares	$\frac{8,00,000}{80,000}$	$\frac{6,75,000}{55,000}$	$\frac{6,00,000}{55,000}$
EPS	₹ 10	₹ 12.20	₹ 10.88

**Interpretation:** Since the EPS is highest for plan B (₹ 12.20), the company will be going for debt financing and do not lose the control.

12. The capital structure of Ashoka Hotels Ltd. consists of an equity share capital of ₹ 10,00,000 (share of ₹ 10 per value) and ₹ 10,00,000 of 20% debentures. Sales increased by 25% from 2,00,000 units to 2,50,000 units, the selling price is ₹ 10 per unit, variable costs is ₹ 6 per unit, and fixed expenses amount to ₹ 2,50,000, and income tax is 50%. You are required to calculate the following:

- Percentage increase in earnings per share
- Degree of financial leverage at 2,00,000 units and 2,50,000 units
- Degree of operating leverage at 2,00,000 units and 2,50,000 units

**Solution:**

Particulars	Sales at 2,00,000 units	Sales at 2,50,000 units
Sales (₹ 10)	20,00,000	25,00,000
Less: variable cost (₹ 6)	12,00,000	15,00,000
<b>Contribution</b>	8,00,000	10,00,000
Less: Fixed cost	2,50,000	2,50,000
<b>Earning before Interest and Taxes (EBIT)</b>	5,50,000	7,50,000
Less: Interest on debenture	2,00,000	2,00,000
<b>Earning before Taxes (EBT)</b>	3,50,000	5,50,000
Less: 50% Taxes	1,75,000	2,75,000

*Contd.*

<b>Earning After Tax (EAT) or Earnings available for equity shareholders</b>	1,00,000	2,75,000
EPS = Amount available for equity shareholders/Number of equity shares	$\frac{1,75,000}{1,00,000}$ <b>₹ 1.75</b>	$\frac{2,75,000}{1,00,000}$ <b>₹ 2.75</b>
<b>Financial leverage</b> = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{5,00,000}{3,50,000}$ <b>1.5 times</b>	$\frac{7,50,000}{1,00,000}$ <b>1.36 times</b>
<b>Operating leverage</b> = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{8,00,000}{5,50,000}$ <b>1.45 times</b>	$\frac{10,00,000}{7,50,000}$ <b>1.33 times</b>

$$\begin{aligned}\text{Percentage increase in EPS} &= \frac{\text{Increase in EPS}}{\text{Old EPS}} \times 100 \\ &= \frac{2.75 - 1.75}{1.75} \times 100 = 57\%\end{aligned}$$

13. From the following information, determine the EPS of the company and also mention the percentage change in EPS associated with 25% decrease in the EBIT. Comment on changes. EBIT—₹ 4,00,000, 10% debentures—₹ 12,00,000, 12% preference shares—₹ 4,00,000 equity shares of ₹ 100 each—₹ 10,00,000, Tax—50%

**Solution:**

**Working Note:** Calculation of EBIT

25% increase	$4,00,000 \times 25/100 = ₹ 1,00,000$ $1,00,000 + 4,00,000 = ₹ 5,00,000$
25% decrease	$4,00,000 \times 25/100 = ₹ 1,00,000$ $4,00,000 + 1,00,000 = ₹ 3,00,000$

<i>Particulars</i>	<i>Existing</i>	<i>EBIT 25% increase</i>	<i>EBIT 25% decrease</i>
Operating profit (EBIT)	4,00,000	5,00,000	3,00,000
Less: Debentures $(12,00,000 \times 10/100)$	1,20,000	1,20,000	1,20,000
Earning before tax (EBT)	2,80,000	3,80,000	1,80,000
Less: Tax at 50%	1,40,000	1,90,000	90,000
Earning after Tax (EAT)	1,40,000	1,90,000	90,000
Less: Preference dividend $(4,00,000 \times 12/100)$	48,000	48,000	48,000

*Contd.*

Amount available for equity shareholders	92,000	1,42,000	42,000
Number of equity shares	10,000 shares	10,000 shares	10,000 shares
EPS = Amount available for equity share holders/ Number of equity shares	$\frac{92,000}{10,000}$	$\frac{142,000}{10,000}$	$\frac{42,000}{10,000}$
<b>EPS</b>	<b>₹ 9.20</b>	<b>₹ 14.20</b>	<b>₹ 4.20</b>

(a) Calculation of increase in EPS: (I and II)

$$\% \text{ increase in EPS} = \frac{\text{Increase in EPS}}{\text{Old EPS}} \times 100 = \frac{14.20 - 9.20}{9.20} \times 100 = 54\%$$

(b) Calculation of increase in EPS: (I and II)

$$\% \text{ increase in EPS} = \frac{\text{Decrease in EPS}}{\text{Old EPS}} \times 100 = \frac{4.20 - 9.20}{9.20} \times 100 = 54\%$$

14. Wonderful Hotels Ltd. has the following balance sheet as on 31st December 2007:

<i>Liabilities</i>	₹	<i>Assets</i>	₹
Equity capital (8000 shares of ₹ 100 each)	8,00,000	Fixed assets	10,00,000
10% Debentures	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

<i>Income Statement</i>	₹
Sales	3,40,000
Less: Operating expenses (including ₹ 60,000 as depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
EBT	1,60,000
Less: Taxes at 50%	80,000
EAT	80,000

- (a) Determine operating leverage, financial leverage and combined leverage at the current level if all operating expenses other than depreciation are variable costs.
- (b) If the sales level increases by 20% and if sales level decreases by 20%, what will be the earning per share?

**Solution:**

Statement showing Leverages and EPS of Wonderful Hotels Ltd.

<i>Particulars</i>	<i>Present Position</i>	<i>Sale at 20% Increased</i>	<i>Sale at 20 % Decreased</i>
Sales	3,40,000	4,08,000	2,72,000
Less: Variable expenses	60,000	72,000	48,000
Contribution	2,80,000	3,36,000	2,24,000
Less: Fixed cost	60,000	60,000	60,000
Earning before Interest and Tax (EBIT)	2,20,000	2,76,000	1,64,000
Less: Interest	60,000	60,000	60,000
Earning before tax	1,60,000	2,16,000	1,04,000
Less: Tax at 50%	80,000	1,08,000	52,000
Amount available for equity shareholders	80,000	1,08,000	52,000
Number of equity shares	8000 shares	8000 shares	8000 shares
EPS = Amount available for equity shareholders/ Number of equity shares	$\frac{80,000}{8000}$	$\frac{1,08,000}{8000}$	$\frac{52,000}{8000}$
EPS	<b>₹ 10</b>	<b>₹ 13.25</b>	<b>₹ 6.50</b>
Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{2,80,000}{2,20,000}$	$\frac{3,36,000}{2,16,000}$	$\frac{2,24,000}{1,04,000}$
	<b>1.27 times</b>	<b>1.22 times</b>	<b>1.57 times</b>
Financial leverage = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{2,20,000}{1,60,000}$	$\frac{2,76,000}{2,16,000}$	$\frac{1,64,000}{1,04,000}$
	<b>1.38 times</b>	<b>1.28 times</b>	<b>1.57 times</b>

### Objective Type Questions

1. *Fill in the blanks:*

- (a) \_\_\_\_\_ refers to make up of a firm's capitalization.
- (b) Financial structure refers to the way the firms \_\_\_\_\_ are financed.
- (c) Pricing of funds through debenture is \_\_\_\_\_ than raising funds through shares.
- (d) Capital gearing refers to the relationship between equity capital and \_\_\_\_\_.
- (e) It is better for a company to remain in \_\_\_\_\_ gear during the period of depression.
- (f) The capital structure of company is made up of \_\_\_\_\_ and \_\_\_\_\_ securities.
- (g) Fixed cost bearing securities should be mixed with equity when the rate of earnings is \_\_\_\_\_ the rate of \_\_\_\_\_ of the company.
- (h) Financial leverage is also known as \_\_\_\_\_.
- (i) A firm will have favourable leverage if its \_\_\_\_\_ are more than the debt cost.
- (j) Operating leverage  $\times$  Financial leverage = \_\_\_\_\_.
- (k) Degree of financial leverage = \_\_\_\_\_.
- (l) Operating leverage = \_\_\_\_\_.

2. *State whether the following statements are true or false:*

- (a) Capital structure is the mix of preference and equity share capital.
- (b) Capitalization, capital structure and financial structure do not mean the same.
- (c) Increased use of debt increases the financial risk of equity shareholders.

### Review Questions

1. What is capital structure?
2. What is financing decisions?
3. What is leverage?
4. What is operating leverage?
5. What is combined leverage?
6. What is financial leverage?
7. What is favourable operating leverage?
8. What is unfavourable financial leverage?
9. How are the discounted cash flow methods of capital evaluation superior to the actual cash flow method?
10. What are the essential features of a sound capital structure?
11. Discuss the factors determining capital structure.

### Exercises

1. Calculate the operating, financial and combined leverage from the following information:  
Interest ₹ 5000, Sales ₹ 50,000, Variable cost ₹ 25,000, and Fixed cost ₹ 15,000.



2. A restaurant has sales of ₹ 10,00,000, variable cost ₹ 7,00,000, fixed costs ₹ 2,00,000 and debts of ₹ 5,00,000 at 10% rate of interest. Calculate operating, financial and combined leverage.
3. A firm has sales of ₹ 20,00,000, variable cost of ₹ 14,00,000, fixed costs of ₹ 4,00,000 and debentures of ₹ 10,00,000 in its capital structure obtained at 10%. What are its operating, financial and combined leverage?
4. Calculate operating leverage and financial leverage from the following data:  
Sales (1,00,000 units) ₹ 2,00,000, Variable cost per unit ₹ 0.70, Fixed cost ₹ 65,000, Interest charges ₹ 15,000.
5. The following data are available for Just Inn Resorts: selling price per unit = ₹ 120, variable cost per unit = ₹ 70, fixed cost = ₹ 2,00,000. What is the operating leverage if the company produces and sells 6000 units?
6. Calculate operating, financial, and combined leverage from the following data: sales 1,00,000 units at ₹ 2 per units, variable cost per unit at ₹ 0.70, fixed costs ₹ 1,00,000 and interest charges ₹ 3668.
7. Tulip Resorts has sales of ₹ 5,00,000, variable cost of ₹ 3,00,000, fixed cost of ₹ 1,00,000 and long term-loans of ₹ 4,00,000 at 10% rate of interest. Calculate the composite leverage.
8. A simplified income statement of Shanthi Saagar Ltd. is given below. Calculate and interpret its operating, financial and combined leverage.

Income statement of Shanthi Saagar Ltd. for the year ended on 31st March 2009:

Sales	10,50,000
Variable cost	7,67,000
Fixed cost	75,000
EBIT	2,08,000
Interest	1,10,000
Taxes (30%)	29,400
Net Income	68,600

9. The following figures relate to two restaurants Aruna and Meena:

	<b>Restaurants</b>	
	<b>Aruna</b>	<b>Meena</b>
Sales	5,00,000	1,00,000
Variable cost	20,000	30,000
Fixed cost	15,000	40,000
Interest	5000	10,000

You are required to calculate operating, financial and combined leverages for the two companies.

10. Ecotel Hotel's capital structure consists of ₹ 5,00,000 (shares of ₹ 100 each) equity capital and ₹ 2,00,000 10% debentures. The sales increased by 20% from 50,000 units to 60,000 units the selling price is ₹ 10 per unit variable costs amount to ₹ 6 per unit and fixed expenses amount to ₹ 1,00,000. The rate of income tax is assumed to be 50%.

You are required to calculate:

- (a) The percentage increase in earnings per share.
  - (b) The financial leverage at 50,000 units and 60,000 units.
  - (c) The operating leverage at 50,000 units and 60,000 units.
11. Calculate financial leverage and operating leverage under situations A and B and Financial plans I and II, respectively from the following information relating to the operation and capital structure of Atria Ltd:

Installed capacity 1000 units

Actual production and sales 800 units

Selling price per unit ₹ 20

Variable cost per unit ₹ 15

Fixed costs: Situation A ₹ 800 and Situation B ₹ 1500

### Capital Structure

<i>Capital Structure</i>	<i>Financial Plan I</i>	<i>Financial Plan II</i>
Equity	₹ 5000	₹ 7000
Debt	₹ 5000	₹ 2000

How will various calculations be useful to the financial manager of the company?

12. Calculate operating leverage and financial leverage under situations A, B, and C and Financial Plan I, II, and III, respectively, from the following information relating to the operation and capital structure of MTR co. Also find out the combinations of operating and financial leverage, which give the highest value and the least value. How are these calculations useful to the financial manager in a company?

Installed capacity 1200 units

Actual production and sales 8 units

Selling price per unit ₹ 15

Variable cost per unit ₹ 10

Fixed costs:—

Situation A ₹ 1000,      Situation B ₹ 2000,      Situation C ₹ 3000

### Capital Structure

<i>Capital Structure</i>	<i>Financial Plan I</i>	<i>Financial Plan II</i>	<i>Financial Plan III</i>
Equity	₹ 5000	₹ 7500	₹ 2500
Debt	₹ 5000	₹ 2500	₹ 7500

Cost of debt is 12%.

13. Meena Restaurant has the following capital structure:

	₹
5000 Equity shares of ₹ 10 each	50,000
1000, 10% Preference shares of ₹ 100 each	1,00,000
1000, 10% Debentures of ₹ 100 each	1,00,000

Calculate the EPS for each of the following levels of EBIT: (a) ₹ 50,000, (b) ₹ 30,000, (c) ₹ 70,000. The company pays 50% tax. Calculate also the financial leverage taking EBIT level.

14. Arun Hotels has equity share capital of ₹ 5,00,000 divided into shares of ₹ 100. It has an expansion programme requiring an investment of ₹ 2,50,000. The management is considering the following alternative for raising this amount:

- (a) Issue of 2500 equity shares of ₹ 100 each
- (b) Issue of 2500 8% preference shares of ₹ 100 each
- (c) Issue of 2500 10% debentures of ₹ 100 each.

The company's present earnings before interest and tax are ₹ 2,50,000 per annum.

You are required to calculate the effect of each of the above modes of financing on the earning per share assuming that the EBIT continues to be the same as before and the rate of income tax is 50%.

15. Calculate the EPS of the company which has an operating profit (EBIT) of ₹ 4,00,000. Its capital structure consists of the following securities:

10% Debentures	₹ 12,00,000
12% Preference shares	₹ 4,00,000
Equity shares of ₹ 100 each	₹ 10,00,000

Find out the percentage changes in earning per share associated with 25% increase and 25% decrease in the operating profit.

# 11

## Chapter

# Investment Decisions

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning, definition and nature of capital budgeting
- Need and importance of capital budgeting
- Disadvantages of capital budgeting
- Capital budgeting process
- Factors affecting capital investment decisions
- Techniques of evaluation of investment proposals/methods of capital budgeting

### INTRODUCTION

The **capital investment decisions** are mainly governed by the process of ranking and identifying the capital investments of the firm. The firm needs to decide which of the given investments will ensure the most value to the business. The purpose of the capital investment decisions includes allocation of the firm's capital funds most effectively in order to ensure the best return possible. Evaluating the projects and allocating capital depending on the requirements of the projects are the most important aspects of capital investment decisions.

Investment decision relates to the determination of total amount of assets to be held in the firm, the composition of these assets and the business risk complexions of the firm as perceived by its investors. It is the most important financial decision. Since funds involve cost and are available in a limited quantity, its proper utilization is very necessary to achieve the goal of wealth maximization.

The investment decisions can be classified under two broad groups: (i) Long-term investment decision and (ii) Short-term investment decision. The long-term investment decision is referred to as the capital budgeting and the short-term investment decision as working capital management.

## CAPITAL BUDGETING

The investment decisions, also popularly termed capital budgeting decision, require comparison of cost against benefits over a long period. For example, the deployment of finances on additional plant and equipment cannot be recovered in the short run. Such investment may affect revenues for the time period ranging from 2 to 20 years or more. Such investment decision involves a careful consideration of various factors, viz., profitability, safety, liquidity, solvency, etc.

Capital budgeting or capital expenditure budget is a process of making decision regarding investments in fixed assets, such as land, building, machinery or furniture which are not meant for sale. The word ‘investment’ refers to the expenditure which is required to be made in connection with the acquisition and the development of long-term facilities including fixed assets. It refers to a process by which management selects those investment proposals which are worthwhile for investing available funds. Capital budgeting is about the decision whether or not to acquire or add to or replace fixed assets in the light of overall objectives of the firm.

The term capital budgeting refers to long-term planning for proposed capital outlays and their financing. It includes both arising of long-term funds and their utilization. It may be defined as ‘the firm’s formal process for the acquisition and investment of capital’. It is the decision-making process by which the firms evaluate the purchase of major fixed assets. It involves the firm’s decision to invest its current funds for addition, disposition, modification and replacement of long-term or fixed assets. However, it should be noted that the investment in current assets, necessitated on account of investment in a fixed asset, is also to be taken as a capital budgeting decision.

### Definitions of Capital Budgeting

Capital budgeting can be defined as follows:

According to **Charles T Horngreen**, capital budgeting is “long-term planning for making and financing proposed capital outlays.”

**R.M. Lynch** defined capital budgeting as “planning, the development of available capital for the propose of maximizing the long-term profitability of the firm.”

According to **Keller and Ferrara** “The capital expenditure budget represents the plans for the appropriations and expenditures for fixed assets during the budget period.”

It the words of **Richards and Green law**, “The capital budgeting generally refers to acquiring inputs with long returns.”

As per **Milton H Spencer**, “capital budgeting involves the planning of expenditures for assets, the returns from which will be realized in future time periods.”

### Nature of Capital Budgeting

Nature of capital budgeting can be explained in brief as under:

#### **Volume of Investment**

Capital expenditure plans involve a huge investment in fixed assets.

#### **Term of Investment**

Capital expenditure, once approved, represents long-term investments that cannot be reserved or withdrawn without sustaining a loss.

**Objectivity of Decision**

Preparation of capital budget plans involves forecasting of several years profits in advance in order to judge the profitability of projects.

**Consequences of Decision**

In view of the investment of large amount for a fairly long period of time, any error in the evaluation of investment projects may lead to serious consequences, financially and otherwise, and may adversely affect the other future plans of the organization.

**Features of Capital Budgeting**

The features of capital budgeting are as follows

**Volume of Expenditure**

Capital budgeting involves a huge expenditure in fixed assets.

**Comparability of Profits**

To allocate or invest the available funds among the competing capital projects in order to maximize the total profitability.

**Prioritization**

To assess the various capital projects and establish priorities.

**Coordination**

To establish proper coordination among various capital expenditure projects.

**Control**

To maintain effective control on cost of capital expenditure projects.

**Minimize Loss**

To minimize losses and wastages arising on account of wrong investment in capital assets.

**Long-term Planning**

To provide the basis for planning the long-term financial requirements and the sources for meeting them.

**Need and Importance of Capital Budgeting**

The importance of capital budgeting can be well understood from the fact that an unsound investment decision may prove to be dangerous to the very existence of the business. The need, significance or importance of capital budgeting arises mainly due to the following:

**Huge Investment**

In most cases, the funds available with the firm will be limited and the need for funds for large investments exceeds its resources. Capital budgeting decisions are very vital for an organization to plan and control its capital expenditure.

***Irrevocable Decisions***

A capital investment (expenditure) decision, once taken, is difficult to revoke. The capital expenditure decisions are of irrecoverable nature since it is taken for acquiring a permanent asset. It becomes very difficult to dispose of these assets without incurring heavy losses.

***Difficulties of Investment Decisions***

Since the decision taken on capital investment extends beyond the current financial year, it is difficult to take long-term investment decisions. These decisions involve uncertainties of future and higher degree of risk.

***Long-term Effect on Profitability***

A capital budgeting decision taken today not only affects the present profitability but also the future growth and profitability of the enterprise. A wrong decision may not only lead the firm to a devastating future, it may even cause danger to the very survival of the enterprise.

***National Importance***

The decision by individual enterprise on capital investment provides employment opportunities. It helps in the economic growth of the country.

***Risk Element***

The long-term commitment of funds increases the financing risk involved in the investment decision. If more risk is involved, greater care is to be taken in the planning of capital budgeting.

***Wealth Maximization of Shareholders***

The long-term investment decision helps the wealth maximization and protects the interests of the shareholders and of the enterprise as it avoids over investment and under investment in fixed assets.

***Competitive Positioning of the Firm***

Capital investments regarding fixed assets decisions have a bearing on the competitive position of the firm because the fixed assets represent, the true earning assets of the enterprise. They facilitate the enterprise to produce finished goods that can eventually be sold for profit.

***Cost Reduction***

Capital budgeting decisions help in cost reduction, which is essential for purchasing most up-to-date and modern equipment.

***Expansion***

A company may think of expanding its activities if its product is in great demand. The expansion involves an addition of capacity to the existing production facilities.

## Disadvantages of Capital Budgeting

Capital budgeting has the following disadvantages:

1. It is not possible to predict in strictly quantitative terms the benefits relating to long-term investment.
2. The most common mistake committed in capital budgeting proposal is the failure to select or consider alternatives.
3. It involves production of benefit to be received from investments in some future period. But, in actual practice, future is uncertain and unpredictable. A failure to forecast correctly is likely to lead to so many mistakes.
4. There are possibilities of shifts in the consumer demand and preference. Introduction of new product, technology development, changes in economic and social environment, etc. may have an adverse effect on investments.
5. There is a surprisingly wide spread conviction that adjustments for corporate taxes are an academic matter.

## CAPITAL BUDGETING PROCESS

Capital budgeting is a composite process as it involves decisions relating to the investment of existing funds for the benefit to be achieved in future, which is uncertain. The following are the procedures or steps or process in capital budgeting:

### Identification of Investment Proposals

The first step in the capital budgeting process is to identify an investment proposal. The proposal may be to add a new product to the existing line of products or to expand the capacity of the existing product or to reduce the cost of production by installing a new machinery, etc.

### Screening the Proposals

After identifying various proposals, they have to be screened in order to find out which of the proposals is profitable with least capital investment. After screening, the proposal which gives the highest return will be selected.

### Evaluation of the Proposals

The next step in capital budgeting process is to evaluate the profitability of various proposals. Project evaluation is done in terms of capital costs on expected returns for evaluating. There are many methods, such as pay back period method, rate of return method, net present value method, etc.

### Fixing Priorities

The next step is to rank the various proposals and to establish priorities after considering urgency, risk and profitability involved therein.



## Final Approval

Once the financial manager has reviewed the projects, he will present various alternatives of capital expenditure to the top management. The board of directors gives its final approval to the proposal depending upon the funds, taking into account the urgency and profitability to the project.

## Implementing Project

The finance manager has to assign the responsibilities for implementing the project, taking into account the time and cost factors. Network techniques are a method used to control and monitor the implementation of the projects.

## Forms and Procedures

All forms and procedures should be in place to implement the capital budgeting decisions.

## FACTORS AFFECTING CAPITAL INVESTMENT DECISIONS

The following are the important factors to be taken into account while making a capital investment decisions:

### Amount of Investment

If an enterprise has huge amount of funds for investment, it accepts all the capital investment proposals which give a rate of return higher than the minimum acceptable or cut off rate. On the other hand, if the enterprise is having inadequate funds, it should adopt capital rationing. In order to determine which project it has to select first on the basis of investment, the project should be arranged in ascending order according to the amount of capital investment required as shown below:

Project A Purchase of new plant	20,00,000
Project B Expansion of the existing plant	30,00,000
Project C Production of new product	35,00,000
Project D Contact for new sales offer	40,00,000

If the enterprise has the funds ₹ 30,00,000, then it can accept the second proposal and reject the others.

### Minimum Rate of Return

Every company management expects a minimum rate of return on the capital investment based on the cost of capital to be invested. For example, if the cost of capital is 20%, the management will accept the project if it yields a return of more than 20%. If the rate of return is less than 20%, management will not accept the proposal. Thus, projects giving a yield below the desired rate of return will be rejected.

### Cut-off Point

The point below which a project would not be accepted is known as the cut-off point. If 20% is the preferred rate of return, the cut-off point or rate is 20%. The cut-off point may be expressed in

terms of period. For example, if the management wants that the investment in the project should be recouped within a period of three years, the period of three years would be taken as the cut-off period. The management would not accept the project if the project is not capable of recouping the investment within three years.

### **Expected Return from the Investment**

While evaluating capital investment proposals, it is necessary to estimate the future return or benefits accruing from the investment proposal. Accounting profit and cash flow are two criteria for quantifying benefits from capital investment decisions. The term 'accounting profit' is identical with the income concept. As no cash expenditure is involved, while estimating cash flows, depreciation charges and other amortization charges of fixed assets are not subtracted from gross revenue.

### **Risk and Uncertainty**

The terms 'risk' and 'uncertainty' are used interchangeably. Risk in capital investment decisions may be due to general economic conditions, competition, technological developments, consumer preferences, labour conditions, etc. On account of these reasons, the revenues, costs and economic life of a particular investment are not certain.

### **Ranking the Investment Proposals**

Ranking of capital investment proposals is mainly required in the following circumstances: (i) there is a limit of funds available for investment and (ii) where two or more investment opportunities are mutually exclusive, only one of the opportunities can be taken.

### **Additional Funds**

All capital investment proposals for increasing revenue require additional funds for meeting working capital needs.

### **Urgency of the Project**

Some capital budgeting decisions are undertaken, irrespective of their profitability, which are essential for the survival of the firm. When there is a breakdown of machinery or production process, management has to take immediate decision to purchase the available components to resume production. Thus, necessity of taking quick corrective action constitutes an important factor other than profitability which influences the managerial decision about capital investment proposals.

## **TECHNIQUES OF EVALUATION OF INVESTMENT PROPOSALS/METHODS OF CAPITAL BUDGETING**

There are several methods for evaluating and ranking the capital investment proposals. In the case of all these methods, the main emphasis is on the return, which will be derived on the capital investment in the project. In other words, the basic approach is to compare the investment in the project with the benefits derived therefrom.

## Traditional Methods

Following are the traditional methods.

1. Payback period method
2. Accounting rate of return method

### Payback Period Method

**Payback period** refers to the period of time required for the return on an investment to “repay” the sum of the original investment. The ‘payback period,’ also called *pay out* or *pay off period* method, represents the period in which the total investment in permanent assets pays back itself. This method is based on the principle that every capital expenditure pays itself back within a certain period out of the additional earnings generated from the capital assets. Thus, it measures the period of time for the original cost of a project to be recovered from the additional earnings of the project itself. Under this method, various investments are ranked according to the length of their payback period in such a manner that the investment with a shorter payback period is preferred to the one which has longer payback period.

In the case of evaluation of a single project, it is adopted if it pays back for itself within a period specified by the management, and if the project does not pay back itself within the period specified by the management, then it is rejected.

The payback period can be ascertained in the following manner:

1. Calculate annual net earnings (profit) before depreciation and after taxes; these are called cash inflows.
2. Divide the initial outlay (cost) of the project by the annual cash inflow, where the project generates constant annual cash inflows.
3. Where the annual cash inflows (profit before depreciation and after taxed) are unequal, the payback period can be found by adding up cash inflows until the total is equal to the initial cash outlay of the project or the original cost of the asset.

For this purpose, net cash inflow shall be calculated first in the following manner:

Cash inflow form sales	XXXX
Less: Operating expenses including depreciation	<u>XXXX</u>
Net income (before tax)	XXXX
Less: Income tax	<u>XXXX</u>
Net income (after tax)	XXXX
Add: Depreciation	<u>XXXX</u>
Net cash inflows	XXXX

$$\text{Pay back Period} = \frac{\text{Cost of project}}{\text{Annual cash inflows}}$$

For example, if a project costs ₹ 1,00,000 and is expected to return ₹ 20,000 annually, the payback period will be ₹ 1,00,000/₹ 20,000, or five years.

**Merits of payback method:**

1. It is easy to calculate and simple to understand.
2. It requires lesser time and labour as compared to other methods of capital budgeting.
3. In this method, a project with a shorter payback period is preferred to the one having a longer payback period.
4. It helps new companies in deciding when they should start paying dividends, i.e. only after the payback period.

**Disadvantages of payback method:**

1. It completely ignores the annual cash inflows after the payback period.
2. It does not take into consideration the cost of capital, which is a very important factor in making wise investment decisions.
3. It may be difficult to determine the minimum acceptable payback period.
4. It does not measure the true profitability of the project, as the period considered under this method is limited to a short period only and not the full life of the asset.
5. It ignores the time value of money.

**Accounting Rate of Return Method**

Accounting rate of returns method of evaluating business investments considers the profitability of a project based on accrual accounting amounts found in the financial statements.

The accounting rate of return is found out by dividing the average income after tax by the average investment. For this purpose, capital employed and related income are determined according to commonly accepted accounting principles and practices over the entire economic life of the project.

$$\frac{\text{Average annual income after tax and depreciation}}{\text{Initial investment}} \times 100$$

$$\frac{\text{Average annual income after tax and depreciation}}{\text{Average investment}} \times 100$$

$$\begin{aligned} \text{Average investment} &= \frac{\text{Original investment}}{2} \quad \text{or} \quad \frac{\text{Original investment} - \text{Scrap value}}{2} \\ &= \frac{\text{Original investment} - \text{Scrap value}}{2} + \frac{\text{Additional net working capital} + \text{Scrap value}}{2} \\ \text{Depreciation} &= \frac{\text{Cost of the machine}}{\text{Life of the machine}} \end{aligned}$$

The drawback of the accounting rate of return is that the net income amounts are not adjusted for the time value of money. In other words, ₹ 10,000 of net income in Year 4 is considered to be as valuable as ₹ 10,000 of net income in Year 1.

### Discounted Method or Time Adjusted Method

The following are the discounted methods:

1. Net present value method
2. Internal rate of return method
3. Profitability index method

#### **Net Present Value Method (NPV)**

The **net present value (NPV)** or **net present worth (NPW)** of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows.

This is generally considered to be the best method for evaluating the capital investment proposals. In case of this method, cash inflow and outflow associated with each project are first worked out. The present values of these cash inflow and outflows are then calculated at the rate of return acceptable to the management. This rate of return is considered as cut off rate and is generally determined on the basis of cost of capital suitably adjusted to allow for the risk element involved in the project.

The net present value mean the difference between the present value of cash outflow and the present value of cash inflows accruing in the future period over the entire life of the project. NPV is used in capital budgeting to analyse the profitability of an investment or project. NPV analysis is sensitive to the reliability of future cash inflows that an investment or project will yield.

Formula:

$$NPV = \sum_{t=1}^T \frac{C_t}{(1+r)^t} - C_o$$

where

$C_t$  = Net annual cash flow

$C_o$  = Initial outlay

$r$  = Discounted cash flow in time

$t$  = Time

The advantages and disadvantages of NPV as a method of project appraisal are given below.

#### **Advantages**

- Shareholder's wealth is maximized.
- It takes into account the time value of money.
- It is based on cash flows, which are less subjective than profits.

#### **Disadvantages**

- It can be difficult to identify an appropriate discount rate.
- Some managers are unfamiliar with the concept of NPV.
- Cash flows are usually assumed to occur at the end of a year, but in practice this is over simplistic.

### Internal Rate of Return Method

The **internal rate of return (IRR)** is a rate of return used in capital budgeting to measure and compare the profitability of investments. It is also called the discounted cash flow rate of return (DCFROR) or simply the rate of return (ROR). The internal rate of return is computed by finding the discount rate that equates the present value of a project's cash outflow with the present value of its cash inflow. In other words, the internal rate of return is that discount rate that will cause the net present value of a project to be equal to zero.

Internal rate of return is that rate at which the sum of discounted cash inflows equals the sum of discounted cash outflows. It is the rate at which the NPV of the investment is zero. It is called internal rate. Therefore, it depends mainly on the outlay and proceeds associated with the project and not on any rate determined outside the investment.

A project should be rejected if its internal rate of return is lower than cut off rate. The formula is

$$\sum_{t=1}^n \frac{\text{Periodic cash flow}}{(1+i)^t} = \text{Investment amount}$$

where

$i$  = Internal rate of return

$t$  = Each time interval

$n$  = Total time intervals

**Where cash inflows are uniform:**

$$\text{IRR} = \frac{\text{Original investment}}{\text{Cash inflow per year}}$$

**Where cash inflows are not uniform:**

$$= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times \text{Difference in rate}$$

*Advantages of internal rate of return:*

1. Perfect use of time value of money theory
2. All cash flows are equally important
3. Uniform ranking
4. Maximum profitability of shareholder
5. Not need to calculate cost of capital

*Disadvantages of internal rate of return:*

1. To understand IRR is difficult.
2. Unrealistic assumption.
3. Not helpful for comparing two mutually exclusive investments.

## ILLUSTRATIONS

## Payback Period Method

1. As a finance manager, which of the following two alternative investments would you advice under the payback period?

<i>Particulars</i>	<i>Proposal A (₹)</i>	<i>Proposal B (₹)</i>
Initial investment	1,00,000	80,000
Annual cash income estimated	30,000	20,000
Life of the project	6 Years	8 Years
Scrap value	Nil	Nil

**Solution:**

**Project A**

Initial investment is ₹ 1,00,000. Annual cash inflow is ₹ 30,000.

$$\begin{aligned}\text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\ &= 1,00,000/30,000 = \mathbf{3.3 \text{ years or 3 years 3 months and 20 days.}}\end{aligned}$$

**Project B**

Initial investment is ₹ 80,000. Annual cash inflow is ₹ 20,000.

$$\begin{aligned}\text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\ &= 80,000/20,000 = \mathbf{4 \text{ years}}\end{aligned}$$

Project A pays back itself in 3 years 3 months and 20 days, whereas Project B takes 4 years to pay back itself. Therefore Project A should be selected.

2. Nagarjuna Hotel limited has the following two proposals. They request you to suggest which of the two proposals have to be accepted under payback period method.

	<i>Proposal A</i>	<i>Proposal B</i>
Initial Investments	1,00,000	1,00,000
Cash inflow: I year	20,000	34,000
II year	25,000	38,000
III year	30,000	28,000
IV year	35,000	25,000
V year	35,000	20,000
Scrap value	Nil	Nil

**Solution:**

**Project A**

Initial investment ₹ 1,00,000

$$\begin{aligned}\text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\ &= (20,000 + 25,000 + 30,000) + (25,000/35,000) \times 12 \\ &= \mathbf{3 \text{ years } 8 \text{ months and } 20 \text{ days.}}\end{aligned}$$

**Notes:**

1. ₹ 75,000 is recovered in the first three years and the balance of ₹ 25,000 is recovered from the cash flow of the 4th year (₹ 35,000).
2. To convert the value into months, it is multiplied by 12.

**Project B**

Initial investment ₹ 1,00,000

$$\begin{aligned}\text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\ &= 34,000 + 38,000 + 28,000 = \mathbf{3 \text{ years}}\end{aligned}$$

Therefore, Project 'B' is preferred as its payback period is shorter than that of Project A.

3. Banerjee Restaurant Ltd. has ₹ 20,00,000 at its disposal for investment. The following proposals are under consideration:

<i>Project</i>	<i>Initial Outlay (₹)</i>	<i>Annual Cash Inflow (₹)</i>	<i>Life in Years</i>
A	10,00,000	2,50,000	5
B	8,00,000	2,60,000	7
C	4,00,000	1,00,000	15
D	10,00,000	2,40,000	20
E	5,00,000	1,12,500	15
F	6,00,000	2,40,000	6
G	2,00,000	1,00,000	2

Rank these projects under the payback period. Also suggest which of these projects should be selected.

**Solution:**

$$\text{Payback period} = \frac{\text{Initial investment}}{\text{Annual cash inflow}}$$



<i>Projects</i>	<i>Initial Investment/Annual Cash Inflow (₹)</i>	<i>Payback Period</i>	<i>Ranks</i>
A	10,00,000/2,50,000	4 years	4
B	8,00,000/2,60,000	3.08 years	3
C	4,00,000/1,00,000	4 years	4
D	10,00,000/2,40,000	4.17 years	5
E	5,00,000/1,12,500	4.4 years	6
F	6,00,000/2,40,000	2.5 years	2
G	2,00,000/1,00,000	2 years	1

The payback period of Projects G, F and B are shortest, as per the ranking, which should be accepted. The total cost of three projects are ₹ 2,00,000 + 6,00,000 + 8,00,000 = ₹ 16,00,000. The balance left over is ₹ 20,00,000 – 16,00,000 = 4,00,000. Projects A and C have got the same payback period, but the cost of Project A is ₹ 10,00,000 and Project C is ₹ 4,00,000. Since the balance left over is ₹ 4,00,000, only project C should be selected.

4. There are two different machines which a firm proposes to purchase. The particulars of the machines are as follows:

	<b>Machine A</b>	<b>Machine B</b>
Cost of machines	₹ 80,000	₹ 80,000
Estimated working life	10 years	10 years
Annual net cash inflows (₹)		
I year	20,000	16,000
II year	20,000	16,000
III year	20,000	16,000
IV year	20,000	16,000
V year	Nil	16,000

Recommend suitable machine.

**Solution:**

$$\text{Payback period} = \frac{\text{Original cost of assets}}{\text{Annual cash inflow}}$$

$$\text{Machine A} = 80,000/20,000 = 4 \text{ years}$$

$$\text{Machine B} = 80,000/16,000 = 5 \text{ years}$$

Machine A is recommended as it has lower payback period compared to Machine B.

### Accounting Rate Return Method

5. The working results of 2 machines are given below:

Particulars	Machine I	Machine II
Cost of machine	45,000	45,000
Sales per year	1,00,000	80,000
Total cost per year excluding depreciation	36,000	36,000
Estimated life	2 years	3 years
Which of the two should be preferred?		

**Solution:**

#### Calculation of depreciation

Depreciation = $\frac{\text{Cost of the machine}}{\text{Life of the machine}}$	$\frac{45,000}{2}$	$\frac{45,000}{3}$
	<b>= 22,500</b>	<b>= 15,000</b>

#### Calculation of annual average earnings:

Sales per year	1,00,000	80,000
Less: Cost per year	36,000	30,000
	64,000	50,000
Less: Depreciation	22,500	15,000
Net Earning	41,500	35,000

#### Calculation of average investment:

Average Investment = $\frac{\text{Original investment}}{2}$	$\frac{45,000}{2}$	$\frac{45,000}{2}$
	<b>= 22,500</b>	<b>= 22,500</b>

#### Calculation of average rate of return:

$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100$	$\frac{41,500}{22,500} \times 100$	$\frac{35,000}{22,500} \times 100$
	<b>= 184%</b>	<b>= 156%</b>

Machine I has higher accounting rate of return and hence it is preferable.

6. From the following particulars of two machines A and B, calculate ARR and decide which machine is preferable.

Particulars	Machine A	Machine B
Sales	60,000	75,000
Cost	40,000	50,000
Life of the machine	4 years	5 years
Cost per year (excluding depreciation)	15,000	22,000

**Solution:****Calculation of depreciation:**

$$\text{Depreciation} = \frac{\text{Cost of the machine}}{\text{Life of the machine}}$$

<b>Machine A</b>	<b>Machine B</b>
$\frac{40,000}{4}$	$\frac{50,000}{5}$
<b>= 10,000</b>	<b>= 10,000</b>

**Calculation of annual average earnings:**

Sales per year	60,000	75,000
Less: Cost per year	15,000	22,000
	45,000	53,000
Less: Depreciation	10,000	10,000
Net Earning	35,000	43,000

**Calculation of Average Investment:**

$$\text{Average investment} = \frac{\text{Original investment}}{2}$$

$\frac{40,000}{2}$	$\frac{50,000}{2}$
<b>= 20,000</b>	<b>= 25,000</b>

**Calculation of average rate of return:**

$$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100$$

$\frac{35,000}{20,000} \times 100$	$\frac{43,000}{25,000} \times 100$
<b>= 175%</b>	<b>= 172%</b>

Machine A has higher accounting rate of return and hence it is preferable.

7. Determine the accounting rate of return from the following information of the two machines X and Y.

<b>Particulars</b>	<b>Machine X</b>	<b>Machine Y</b>
Original cost	56,125	56,125
Additional investment in net working capital	5000	6000
Estimated life in years	5 years	5 years
Estimated scrap value	3000	3000
Income tax rate	55%	55%
(Annual estimated income after depreciation and tax)		
1st Year	3375	11,375
2nd Year	5375	9375
3rd Year	7375	7375
4th Year	9375	5375
5th Year	11,375	3375
<b>Total</b>	<b>36,875</b>	<b>36,875</b>

Depreciation has been charged on straight line base method.

**Solution:**

Calculation of average investment	Machine X	Machine Y
$= \frac{\text{Original investment} - \text{Scrap value}}{2}$	$= \frac{56,125 - 3000}{2}$	$= \frac{56,125 - 3000}{2}$
+ Additional net working capital	+ 5000 + 3000	+ 6000 + 3000
+ Scrap value	= 26,563 + 8000	= 26,563 + 9000
	= <b>34,563</b>	= <b>35,563</b>

Calculation of annual average net earnings:	Machine X	Machine Y
$\frac{\text{Total income after tax and depreciation}}{\text{Estimated life of the machine}} \times 100$	$= \frac{36,875}{5}$	$= \frac{36,875}{5}$
	= <b>7375</b>	= <b>7375</b>

Calculation of average rate of return:	Machine X	Machine Y
$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100$	$\frac{7375}{34,563} \times 100$	$\frac{7375}{34,563} \times 100$
	= <b>21.33%</b>	= <b>20.74%</b>

Machine X has higher accounting rate of return and hence it is preferable.

8. Chancery Hotels Ltd. is proposing to take up a project which requires an investment of ₹ 40,000. The net income before depreciation and tax is estimated as follows:

Years	Net Income before depreciation and tax
1	10,000
2	12,000
3	14,000
4	16,000
5	20,000

Depreciation is to be charged on straight line bases and tax rate 50%.

**Solution:**

**Calculation of depreciation:**

$$\text{Depreciation} = \frac{\text{Cost of the machine}}{\text{Life of the machine}} \frac{40,000}{5} = \mathbf{8000 \text{ per year}}$$

**Calculation of net incomings before depreciation and tax**

Years	
1	10,000
2	12,000
3	14,000
4	16,000
5	20,000
	<u>72,000</u>
Less: Deprecation for 5 years	<u>40,000</u>
	32,000
Less: 50% tax	16,000
Total income after tax and Depreciation	<u>16,000</u>

**Calculation of annual average net earnings:**

$$= \frac{\text{Total income after tax and depreciation}}{\text{Estimated life of machine}} = \frac{16,000}{5} = 3200$$

**Calculation of average investment:**

$$= \frac{\text{Original investment}}{2} = \frac{40,000}{2} = 20,000$$

**Calculation of average rate of return:**

$$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100 = \frac{3200}{20,000} \times 100 = 16\%$$

9. A project requires an investment of ₹ 10,00,000. The plant and machinery required for the project will have a scrap value of ₹ 80,000 at the end of its useful life of 5 years. The profits after tax and depreciation are estimated as under.

Years	₹
1	50,000
2	75,000
3	1,25,000
4	1,30,000
5	80,000
	<u>4,60,000</u>

Calculate the accounting rate of return.

**Solution:**

**Calculation of annual average net earnings:**

$$= \frac{\text{Total income after tax and depreciation}}{\text{Estimated life of machine}} = \frac{4,60,000}{5} = \mathbf{92,000}$$

**Calculation of average investment:**

$$= \frac{\text{Original investment} - \text{Scrap}}{2} = \frac{10,00,000 - 80,000}{2} = \mathbf{4,60,000}$$

**Calculation of average rate of return:**

$$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100 = \frac{92,000}{4,60,000} \times 100 = \mathbf{20\%}$$

10. Shanthi Saagar Ltd. has under consideration the following two projects. The details are as under:

Particulars	Project X	Project Y
Investment in machinery	10,00,000	15,00,000
Working capital	5,00,000	5,00,000
Life of the machinery	4 years	6 years
Scrap value of machinery	10%	10%
Tax rate	50%	50%

Income before depreciation and tax:

Years	Project X	Project Y
1	8,00,000	15,00,000
2	8,00,000	9,00,000
3	8,00,000	15,00,000
4	8,00,000	8,00,000
5	—	6,00,000
6	—	3,00,000

You are required to calculate ARR and suggest which project is to be preferred.

**Solution:**

**Calculation of Average Investment**

$$= \frac{\text{Original investment} - \text{Scrap value}}{2} + \text{Additional net working capital} + \text{Scrap value}$$

$$\text{Project X} = \frac{10,00,000 - 1,00,000}{2} + 5,00,000 + 1,00,000$$

$$= 4,50,000 + 6,00,000 = \mathbf{10,50,000}$$

$$\begin{aligned}\text{Project Y} &= \frac{15,00,000 - 1,50,000}{2} + 5,00,000 + 1,50,000 \\ &= 6,75,000 + 6,50,000 = \mathbf{13,25,000}\end{aligned}$$

**Calculation of annual average net earnings:**

Years	Project X	Project Y
1	8,00,000	5,00,000
2	8,00,000	9,00,000
3	8,00,000	15,00,000
4	8,00,000	8,00,000
5	—	6,00,000
6	—	3,00,000
	<u>32,00,000</u>	<u>46,00,000</u>
Less: Depreciation	<u>9,00,000</u>	<u>13,50,000</u>
	<u>23,00,000</u>	<u>32,50,000</u>
Less: 50% Tax	<u>11,50,000</u>	<u>16,25,000</u>
Total income after tax and depreciation	<u>11,50,000</u>	<u>16,25,000</u>

**Calculation of annual average net earnings:**

	Machine X	Machine Y
= $\frac{\text{Total income after tax and depreciation}}{\text{Estimated life of machine}}$	$\frac{11,50,000}{4}$	$\frac{16,25,000}{6}$
	<b>= 2,87,500</b>	<b>= 2,70,833</b>

**Calculation of average rate of return:**

	Machine X	Machine Y
$\frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100$	$\frac{2,87,500}{10,50,000} \times 100$	$\frac{3,54,167}{16,25,000} \times 100$
	<b>= 27.3%</b>	<b>= 21.79%</b>

Machine X has higher accounting rate of return and hence it is preferable.

11. The directors of Apple Hotels Ltd. are purchasing a new machine to replace an old are which has been in operation in the hotels for the last 5 years.

Ignoring interest but considering tax 50% of net earnings, suggest which of the two alternatives should be preferred. The following are the details:

Particulars	Old Machine	New Machine
Purchased price	40,000	60,000
Estimated life of machine	10 years	10 years
Machine running hours p.a.	2000	2000
Units per hour	24	36

Wages per running hr	₹ 3	₹ 5.25
Power per annum	₹ 2000	₹ 4500
Consumable stores per annum	₹ 6000	₹ 7000
All other charges per annum	₹ 8000	₹ 9000
Material cost per unit	0.50 ps	0.50 ps
Selling price per unit	₹ 1.25	₹ 1.25

You may assume that the above information regarding sales and cost of sales will hold goods throughout the economic life of each of the machines.

**Solution:**

Particulars	Old Machine	New Machine
Cost of machine	40,000	60,000
Life of the machine	10 years	10 years
<b>Output</b>	<b>48,000</b>	<b>72,000</b>
	<b>(2000 × 24)</b>	<b>(2000 × 36)</b>

**Profitability Statement**

<b>Sales</b>	<b>60,000</b>	<b>90,000</b>
	<b>(48,000 × 1.25)</b>	<b>(72,000 × 1.25)</b>
<i>Less: Variable cost</i>		
Direct materials	24,000	36,000
Wages	6000	10,500
Power	2000	4500
Stores	6000	7000
Other expense	8000	9000
Depreciation	4000	6000
	<u>50,000</u>	<u>73,000</u>
Profit before tax	10,000	17,000
<i>Less: 50% Tax</i>	<u>5000</u>	<u>8500</u>
Profit after tax	<u>5000</u>	<u>8500</u>

Calculation of Average Rate of Return:	Old Machine	New Machine
$\frac{\text{Annual average net earnings}}{\text{Original investment}} \times 100$	$\frac{5000}{40,000} \times 100$	$\frac{8250}{60,000} \times 100$
	<b>= 12.5%</b>	<b>= 13.75%</b>

New Machine has higher accounting rate of return and hence it is preferable.

12. Find out NPV for a project which requires an initial investment of ₹ 20,000 and which involves a net cash inflow of ₹ 6000 each year for 6 years. The cost of funds is 8%. There is no scrap value (P.V of an annuity of ₹ 1 for 6 years at 8% p.a is ₹ 4.623).



**Solution:**

Net present value ( $6000 \times 4.623$ ) = 27,738

Less: Initial investment = 20,000

NPV of a project 7738

13. A firm has two investment opportunities, each costing ₹ 1,00,000 and each having the expected profit as shown below:

<i>Years</i>	<i>Project A</i>	<i>Project B</i>
1	50,000	20,000
2	40,000	40,000
3	30,000	50,000
4	10,000	60,000

After giving due consideration to the risk for each project, the management has decided that Project A should be evaluated at 10% cost of capital and Project B, a risky project, with a 15% cost of capital.

Compare the NPV and suggest the course of action for the management if both the projects are independent. Both are mutually exclusive.

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>P.V. Factor at 15%</i>
1	0.909	0.870
2	0.826	0.756
3	0.751	0.657
4	0.683	0.572

**Solution:****Calculation of Net Present Value of Project A**

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	50,000	45,450
2	0.826	40,000	33,040
3	0.751	30,000	22,530
4	0.683	10,000	6830
Total P.V. of cash inflow			1,07,850
Less: Initial Investment			1,00,000
<b>Net Present Value</b>			<b>7850</b>

**Calculation of Net Present Value of Project B**

<i>Years</i>	<i>P.V. Factor at 15%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.870	20,000	17,400
2	0.756	40,000	30,240
3	0.657	50,000	32,850
4	0.572	60,000	34,320
Total P.V. of cash inflow			1,14,810
Less: Initial Investment			1,00,000
<b>Net Present Value</b>			<b>14,810</b>

**Notes:**

1. If both projects are independent, accept both the projects as NPV of both are positive.
2. If both the projects are mutually exclusive, accept project B as its NPV is higher than that of A.

14. A choice is to be made between two competing proposals which require an equal investment of ₹ 50,000 and are expected to generate net cash flow as under:

<i>Particulars</i>	<i>Project A</i>	<i>Project B</i>
1st Year ending	25,000	10,000
2nd Year ending	15,000	12,000
3rd Year ending	10,000	18,000
4th Year ending	—	25,000
5th Year ending	12,000	8000
6th Year ending	6000	4000

Cost of capital of the company is 10%. The following are the present value factors at 10% per annum:

<i>Years</i>	<i>P.V. Factor at 10%</i>
1	0.909
2	0.826
3	0.751
4	0.683
5	0.621
6	0.564

Which proposal should be selected using NPV method? Suggest the best project.

**Solution:****Comparative Statement of Project A**

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	25,000	22,725
2	0.826	15,000	12,390
3	0.751	10,000	7510
4	0.683	—	—
5	0.621	12,000	7452
6	0.564	6000	3384
Total P.V. of cash inflow			53,461
Less: Initial Investment			50,000
<b>Net Present Value</b>			<b>3461</b>

**Comparative Statement of Project B**

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	10,000	9090
2	0.826	12,000	9912
3	0.751	18,000	13,518
4	0.683	25,000	17,075
5	0.621	8000	4968
6	0.564	4000	2256
Total P.V. of cash inflow			56,819
Less: Initial Investment			50,000
<b>Net Present Value</b>			<b>6819</b>

Project B's net present value is more and so it should be selected.

15. Using the information given below, calculate net present value. Initial outlay ₹ 80,000 and estimated life is 5 Years.

End of 1st Year	₹ 6000
End of 2nd Year	₹ 14,000
End of 3rd Year	₹ 24,000
End of 5th Year	₹ 16,000
End of 5th Year	₹ —

Depreciation has been calculated under straight line method. The cost of capital may be taken at 20% p.a. and present value of ₹ 1 at 20% p.a. is given below.

<i>Years</i>	<i>P.V. Factor at 20%</i>
1	0.83
2	0.69
3	0.58
4	0.48
5	0.40

**Solution:**

**Calculation of depreciation:**

$$\text{Depreciation} = \frac{\text{Original investment}}{\text{No. of years}} \frac{80,000}{5} = \mathbf{16,000 \text{ per year}}$$

**Statement showing net present value**

<i>Years</i>	<i>Profit after Tax</i>	<i>Depreciation</i>	<i>Cash Inflow</i>	<i>P.V. Factor at 20%</i>	<i>P.V of Cash Inflow</i>
1	6000	16,000	22,000	0.83	18,260
2	14,000	16,000	30,000	0.69	20,700
3	24,000	16,000	40,000	0.58	23,200
4	16,000	16,000	32,000	0.48	15,360
5	—	16,000	16,000	0.40	6400
Total P.V. of cash inflow					83,920
Less: Initial Investment					80,000
<b>Net Present Value</b>					<b>3920</b>

16. A firm is considering a purchase of a machine. Two machines X and Y, each costing ₹ 50,000, are available. Earnings after taxation expected to be as under:

<i>Years</i>	<i>Machine X</i>	<i>Machine Y</i>	<i>P.V. Factor at 10%</i>
1	15,000	5000	0.909
2	20,000	15,000	0.826
3	25,000	20,000	0.751
4	15,000	30,000	0.683
5	10,000	20,000	0.621

Calculate NPV of two alternatives assuming depreciation on straight line bases.

**Solution:****Calculation of depreciation:**

$$\text{Depreciation} = \frac{\text{Original investment}}{\text{No. of years}}$$

**Machine X**

$$\frac{50,000}{5} = 10,000$$

**Machine Y**

$$\frac{50,000}{5} = 10,000$$

**Comparative Statement of Machine X**

<i>Years</i>	<i>Profit after Tax</i>	<i>Depreciation</i>	<i>Cash Inflow</i>	<i>P.V. Factor at 10%</i>	<i>P.V. of Cash Inflow</i>
1	15,000	10,000	25,000	0.909	22,728
2	20,000	10,000	30,000	0.826	24,792
3	25,000	10,000	35,000	0.751	26,296
4	15,000	10,000	25,000	0.683	17,075
5	10,000	10,000	20,000	0.621	12,418
Total P.V. of cash inflow					1,03,309
Less: Initial Investment					50,000
<b>Net Present Value</b>					<b>53,309</b>

**Comparative Statement of Machine Y**

<i>Years</i>	<i>Profit after Tax</i>	<i>Depreciation</i>	<i>Cash Inflow</i>	<i>P.V. Factor at 10%</i>	<i>P.V. of Cash Inflow</i>
1	5000	10,000	15,000	0.909	13,637
2	15,000	10,000	25,000	0.826	20,660
3	20,000	10,000	30,000	0.751	22,539
4	30,000	10,000	40,000	0.683	27,320
5	20,000	10,000	30,000	0.621	18,627
Total P.V. of cash inflow					1,02,783
Less: Initial Investment					50,000
<b>Net Present Value</b>					<b>52,783</b>

17. After conducting a survey that cost ₹ 2,00,000, X Ltd. decides to undertake a project for placing a new product on the market. The company's cut off rate is 12%. It was estimated that the project would cost ₹ 40,00,000 in plant and machinery in addition to working capital of ₹ 10,00,000. The scrap value of the plant and machine at the end of 5th year was estimated at ₹ 5,00,000. After providing for depreciation on straight line bases, profits after tax were estimated as follows:

<i>Years</i>	<i>Cash Inflows</i>	<i>P.V. Factor at 12%</i>
1	3,00,000	0.8929
2	8,00,000	0.7972
3	13,00,000	0.7118
4	5,00,000	0.6355
5	4,00,000	0.5674

Ascertain the present value of the project.

**Solution:**

**Calculation of depreciation:**

Cost of Survey	2,00,000
Plant and Machinery	40,00,000
	<u>42,00,000</u>
Less: Scrap value	5,00,000
Total cost	<u>37,00,000</u>

$$\text{Depreciation} = \frac{\text{Original cost}}{\text{No. of years}} \frac{37,00,000}{5} = 7,40,000$$

<i>Years</i>	<i>Profit after Tax</i>	<i>Depreciation</i>	<i>Cash Inflow</i>	<i>P.V. Factor at 12%</i>	<i>P.V. of Cash Inflow</i>
1	3,00,000	7,40,000	10,40,000	0.8929	9,28,616
2	8,00,000	7,40,000	15,40,000	0.7972	12,27,688
3	13,00,000	7,40,000	20,40,000	0.7118	14,52,072
4	5,00,000	7,40,000	12,40,000	0.6355	7,88,020
5	4,00,000	7,40,000	11,40,000	0.5674	6,46,836
Add: Working capital at the 10,00,000				0.5674	5,67,400
Add: Scrap value at the end of 5th Year 5,00,000				0.5674	2,83,700
Total P.V. of cash inflow					58,94,332
Less: Initial Investment (2,00,000 + 40,00,000 + 10,00,000)					52,00,000
<b>Net Present Value</b>					<b>6,94,332</b>

18. Jungle Resorts Limited Co. is considering two projects requiring capital outlay of ₹ 1,00,000 for Project A and ₹ 3,00,000 for Project B. Forecast of annual income, after depreciation but before tax, are as follows:

<i>Years</i>	<i>Project A</i>	<i>Project B</i>
1	50,000	1,25,000
2	50,000	1,00,000
3	40,000	50,000
4	40,000	75,000
5	20,000	1,00,000

Depreciation may be taken at 20% on original cost. Tax rate is at 50% on net income. You are required to evaluate the projects according to

- NPV at 10% rate
- Profitability index.

The PV factors at 10% for 1 to 5 year are 0.909, 0.826, 0.751, 0.683 and 0.621, respectively.

***Solution:***

**(i) Net present value method**

The cash inflow given is after depreciation, but before tax. Cash inflow has to be calculated before depreciation but after tax.

**Project A:**

Initial Investment ₹ 1,00,000

<i>Years</i>	<i>Annual Cash Inflow after Depreciation, before Tax</i>	<i>Less: Tax at 50%</i>	<i>Cash Flow after Tax</i>	<i>Depreciation 20% on 1,00,000</i>	<i>Net Cash Flow</i>
1	50,000	25,000	25,000	20,000	45,000
2	50,000	25,000	25,000	20,000	45,000
3	40,000	20,000	20,000	20,000	40,000
4	40,000	20,000	20,000	20,000	40,000
5	20,000	10,000	10,000	20,000	30,000

**Project B:**

Initial Investment ₹ 3,00,000

<i>Years</i>	<i>Annual Cash Inflow after Depreciation, before Tax</i>	<i>Less: Tax at 50%</i>	<i>Cash Flow after Tax</i>	<i>Depreciation 20% on 1,00,000</i>	<i>Net Cash Flow</i>
1	1,25,000	62,500	62,500	60,000	1,22,500
2	1,00,000	50,000	50,000	60,000	11,000

*Contd.*

3	50,000	25,000	25,000	60,000	85,000
4	75,000	37,500	37,500	50,000	97,500
5	1,00,000	50,000	50,000	60,000	1,10,000

### Calculation of Discounted cash flow

Year	Discount Factor	Project A		Project B	
		Net Cash Inflow	Discounted Cash Flow	Net Cash Inflow	Discounted Cash Flow
1	0.909	45,000	40,905	1,22,500	1,11,353
2	0.826	45,000	37,170	1,10,000	90,860
3	0.751	40,000	30,040	85,000	63,835
4	0.683	40,000	27,320	97,500	66,593
5	0.621	30,000	18,630	1,10,000	68,310
Total P.V. of cash inflow			1,54,065		4,00,950
Less: Initial investment			1,00,000		3,00,000
Net Present Value			54,065		1,00,950

### (ii) Profitability Index:

$$\text{Profitability Index} = \frac{\text{Total discounted cash flow}}{\text{Initial investment}} \times 100$$

$$\text{Project A} = 1,54,065/1,00,000 \times 100 = \mathbf{154.06\%}$$

$$\text{Project B} = 4,00,950/3,00,000 \times 100 = \mathbf{133.65\%}$$

Under the NPV method, Project B is preferred as it gives a higher NPV but under profitability index method, Project A is preferred as it gives a higher profitability.

19. An equipment involves an initial investment of ₹ 6000. The annual cash flow is estimated at ₹ 2000 for 5 years. Calculate internal rate of return.

### Solution:

$$\text{IRR} = \frac{\text{Initial investment}}{\text{Cash inflow per years}} \frac{6000}{2000} = 3 \text{ years}$$



20. Calculate IRR from the following information. Initial investment is ₹ 6000.

<i>Years</i>	<i>P.V. Factor at 18%</i>	<i>P.V. Factor at 20%</i>
1	0.847	0.833
2	0.717	0.694
3	0.609	0.579
4	0.516	0.482
5	0.437	0.402

The annual cash inflow is estimated at ₹ 2000 for 5 years.

**Solution:**

<i>Years</i>	<i>Cash Inflows</i>	<i>P.V. Factor at 18%</i>	<i>P.V. of Cash Inflow</i>	<i>P.V. Factor at 20%</i>	<i>P.V. of Cash Inflow</i>
1	2000	0.847	1694	0.833	1666
2	2000	0.717	1434	0.694	1388
3	2000	0.609	1218	0.579	1158
4	2000	0.516	1032	0.482	964
5	2000	0.437	874	0.402	804
			6252		5980

**Calculation of IRR:**

$$\begin{aligned}
 &= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times 100 \\
 &= 18\% \frac{6252 - 6000}{6252 - 5980} \times 2\% = 18\% \frac{252}{272} \times 2 \\
 &= 18\% + 1.853 = \mathbf{19.853\%}
 \end{aligned}$$

The internal rate of return is ascertained by trial and error. Calculation in an attempt to arrive at a correct interest rate which equals the present value of cash inflow with the P.V. of cash outflow.

21. A company has selected one of the following projects:

<i>Particulars</i>	<i>Project A</i>	<i>Project B</i>
Cost	11,000	10,000
cash inflow		
1 year	6000	1000

*Contd.*

2 year	2000	1000
3 year	1000	2000
4 year	5000	10,000

Using internal rate of return method, suggest which project is preferable.

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>P.V. Factor at 12%</i>	<i>P.V. Factor at 15%</i>
1	0.909	0.8929	0.870
2	0.826	0.7972	0.756
3	0.751	0.7118	0.658
4	0.683	0.6355	0.571
Total	3.169	3.038	2.856

***Solution:***

Calculation of factor:

$$\text{Factor} = \frac{\text{Original investment}}{\text{Average cash inflow per year}}$$

Project: X

$$\frac{\frac{11,000}{6000 + 2000 + 1000 + 5000}}{4} = \frac{\frac{11,000}{14,000}}{4} = \mathbf{3.1429}$$

Project: Y

$$\frac{\frac{10,000}{1000 + 1000 + 2000 + 10,000}}{4} = \frac{\frac{10,000}{14,000}}{4} = \mathbf{2.857}$$

**Statement of Present Value at 10% of Project X**

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	6000	5454
2	0.826	2000	1652
3	0.751	1000	751
4	0.683	5000	3415
<b>Total P.V. of cash inflow</b>			<b>11,272</b>

**Statement of Present Value at 12% of Project Y**

<i>Years</i>	<i>P.V. Factor at 12%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.8929	6000	5358
2	0.7972	2000	1594
3	0.7118	1000	712
4	0.6355	5000	3180
<b>Total P.V. of cash inflow</b>			<b>10,844</b>

Calculation of IRR:

$$\begin{aligned}
 &= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times \text{Difference in rate} \\
 &= 10\% \frac{11,272 - 11,000}{11,272 - 10,844} \times 2\% \quad 10\% = \frac{272}{428} \times 2\% \\
 &= 10\% + 1.271 = \mathbf{11.271\%}
 \end{aligned}$$

**Statement of Present Value at 15% of Project Y**

<i>Years</i>	<i>P.V. Factor at 15%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.870	1000	870
2	0.756	1000	756
3	0.658	2000	1316
4	0.572	1000	572
<b>Total P.V. of cash inflow</b>			<b>8662</b>

**Statement of Present Value at 12% of Project Y**

<i>Years</i>	<i>P.V. Factor at 12%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.8929	1000	893
2	0.7972	1000	797
3	0.7118	2000	1424
4	0.6355	10,000	6360
<b>Total P.V. of cash inflow</b>			<b>9474</b>

Calculation of IRR:

$$\begin{aligned}
 &= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times \text{Difference in rate} \\
 &= 10\% \frac{10,067 - 10,000}{10,067 - 8662} \times 5\% \quad 10\% = \frac{67}{1405} \times 5\% \\
 &= 10\% + 0.238 = \mathbf{10.238\%}
 \end{aligned}$$

### Statement of Present Value at 10%

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	1000	909
2	0.826	1000	826
3	0.751	2000	1502
4	0.683	10,000	6830
Total P.V. of cash inflow			10,067

22. A project costing ₹ 16,000 is accepted to generate cash inflow ₹ 4000 each for 5 years. Calculate IRR. Present value ₹ 1 at various discount rates for the period of 5 years.

<i>Years</i>	<i>P.V. Factor at 7%</i>	<i>P.V. Factor at 8%</i>	<i>P.V. Factor at 9%</i>
1	0.9346	0.9259	0.9174
2	0.8734	0.8573	0.8417
3	0.8163	0.7938	0.7722
4	0.7629	0.7350	0.7084
5	0.7130	0.6806	0.6499
Total	4.1002	3.9926	3.8896

### Solution:

Calculation of factor:

$$\text{Factor} = \frac{\text{Original investment}}{\text{Annual cash inflow}} = \frac{16,000}{4000} = 4$$

Present value of cash inflow at 7% P.V. factor

$$= 4000 \times 4.1002 = 16,400$$

Present value of cash inflow at 8 % P.V. factor

$$= 4000 \times 3.9926 = 15,970$$

Calculation of IRR:

$$\begin{aligned}
 &= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times \text{Difference in rate} \\
 &= 7\% + \frac{16,400 - 16,000}{16,400 - 15,970} \times 1\% \quad 7\% + \frac{400}{430} \times 1\% \\
 &= 7\% + 0.930 = \mathbf{7.930\%}
 \end{aligned}$$

23. A project costing initial investment of ₹ 40,000 is accepted to generate annual cash inflow of ₹ 16,000 for 4 years. Calculate IRR. Present value of ₹ 1 at various discount rates for the period of 4 years.

Years	P.V. Factor at 19%	P.V. Factor at 20%	P.V. Factor at 22%
1	0.8403	0.8333	0.8196
2	0.7062	0.6944	0.6719
3	0.5934	0.5787	0.5507
4	0.4987	0.4823	0.4514
Total	2.6386	2.5887	2.4936

**Solution:**

Calculation of factor:

$$\text{Factor} = \frac{\text{Original investment}}{\text{Annual cash inflow}} = \frac{40,000}{16,000} = 2.5$$

Present value of cash inflow at 19% P.V. factor

$$= 16,000 \times 2.6386 = 42,217.6$$

Present value of cash inflow at 20% P.V. factor

$$= 16,000 \times 2.5887 = 41,419.2$$

Present value of cash inflow at 22% P.V. factor

$$= 16,000 \times 2.4936 = 39,897.6$$

Calculation of IRR:

$$\begin{aligned}
 &= A \frac{\text{Difference between calculated PV and required net cash outlay}}{\text{Difference in calculated PV}} \times \text{Difference in rate} \\
 &= 19\% + \frac{42,217.6 - 40,000}{42,217.6 - 41,419.2} \times 1\% \quad 19\% + \frac{2217.6}{798.4} \times 1\% \\
 &= 19\% + 2.77 = \mathbf{21.77\%}
 \end{aligned}$$

### Profitability Index

The initial cash outlay of a project is ₹ 1,00,000 and it generates cash inflow of ₹ 40,000, ₹ 30,000, ₹ 50,000 and ₹ 20,000, respectively. Assume a 10% rate of discount. Calculate profitability Index.

<i>Years</i>	<i>P.V. Factor at 10%</i>
1	0.909
2	0.826
3	0.751
4	0.683

<i>Years</i>	<i>P.V. Factor at 10%</i>	<i>Cash Inflow</i>	<i>P.V. of Cash Inflow</i>
1	0.909	40,000	36,360
2	0.826	30,000	24,780
3	0.751	50,000	37,550
4	0.683	20,000	13,660
Total P.V. of cash inflow			1,12,350

$$\text{Profitability index} = \frac{\text{Present value of cash inflow}}{\text{Initial cash outlay}} = \frac{1,12,350}{1,00,000} = \mathbf{1.1235}$$

24. Indian Hotels Ltd. is considering the purchase of a machine. Two machines A and B are available, each costing ₹ 5,00,000. Earnings after tax but before depreciation are expected as follows:

<i>Years</i>	<i>Machine A</i>	<i>Machine B</i>
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

NPV at 10% may be taken which will be 0.909, 0.826, 0.751, 0.683 and 0.621, respectively. Evaluate the proposal under:

- Payback period method
- Accounting period method
- NPV method
- Profitability index method

**Solution:****(i) Payback period for Machine A**

$$\begin{aligned}
 \text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\
 &= 1,50,000 + 2,00,000 + 1,50,000/2,50,000 \times 12 \\
 &= 2 \text{ years } 7 \text{ months and } 6 \text{ days.}
 \end{aligned}$$

Payback period for Machine B

$$\begin{aligned}
 \text{Payback period} &= \frac{\text{Initial investment}}{\text{Annual cash inflow}} \\
 &= 50,000 + 1,50,000 + 2,00,000 + 1,00,000/3,00,000 \times 12 \\
 &= 3 \text{ years } 4 \text{ months.}
 \end{aligned}$$

Therefore, Machine A is preferred, as it has a shorter payback period.

**(ii) Accounting rate of return:**

Statement showing the return after depreciation and taxes

<i>Machine A</i>	<i>Years</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Earnings after tax but before depreciation	1,50,000	2,00,000	2,50,000	1,50,000	1,00,000
Less: Depreciation	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Earnings after depreciation and tax	50,000	1,00,000	1,50,000	50,000	Nil

<i>Machine B</i>	<i>Years</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Earnings after tax but before depreciation	50,000	1,50,000	2,00,000	3,00,000	2,00,000
Less: Depreciation	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Earnings after depreciation and tax	-50,000	50,000	1,00,000	2,00,000	1,00,000

Average Return:

Machine A:

$$\begin{aligned}
 &= \frac{50,000 + 1,00,000 + 1,50,000 + 50,000 + 0}{5 \text{ years}} \\
 &= 3,50,000/5 \\
 &= \mathbf{70,000}
 \end{aligned}$$

Machine B:

$$\begin{aligned}
 &= \frac{-50,000 + 50,000 + 1,00,000 + 2,00,000 + 1,00,000}{5 \text{ years}} \\
 &= 4,00,000/5 \\
 &= \mathbf{80,000}
 \end{aligned}$$

**Average Investment:**

Machine A and Machine B:

$$\text{Average investment} = \frac{\text{Cost of the machine}}{2} = \frac{5,00,000}{2} = \mathbf{₹ 2,50,000}$$

**Average Return on investment:**

$$\text{ARR} = \frac{\text{Average return}}{\text{Average investment}} \times 100$$

$$\text{Machine A:} \quad \text{ARR} = \frac{70,000}{2,50,000} \times 100 = 28\%$$

$$\text{Machine B:} \quad \text{ARR} = \frac{80,000}{2,50,000} \times 100 = 32\%$$

Machine B is preferred, as it has a higher average return on average investment.

**(iii) Calculation of Net Present Value**

Year	Discount Factor	Machine A		Machine B	
		Net Cash Inflow	Discounted Cash Flow	Net Cash Inflow	Discounted Cash Flow
1	0.909	1,50,000	1,36,350	50,000	45,450
2	0.826	2,00,000	1,65,000	1,50,000	1,23,900
3	0.751	2,50,000	1,87,750	2,00,000	1,50,200
4	0.683	1,50,000	1,02,450	3,00,000	2,04,900
5	0.621	1,00,000	62,100	2,00,000	1,24,200
Total P.V. of cash inflow			6,53,850		6,48,650
Less: Initial investment			5,00,000		5,00,000
Net Present Value			1,53,850		1,48,650

Machine A has a greater NPV as compared to machine B. Therefore, machine A is preferred.



(iv) **Profitability Index Method:**

$$= \frac{\text{NPV}}{\text{Initial outlay}} \times 100$$

$$\text{Machine A} = \frac{6,53,850}{5,00,000} \times 100 = \mathbf{130.77\%}$$

$$\text{Machine B} = \frac{6,48,650}{5,00,000} \times 100 = \mathbf{129.73\%}$$

Machine A has a greater profitability index as compared to Machine B. Therefore Machine A is preferred.

**Objective Type Questions**1. *Fill in the blanks:*

- (a) Capital budgeting is also known as \_\_\_\_\_ and \_\_\_\_\_.
- (b) Capital investment decisions are generally of \_\_\_\_\_ nature.
- (c) Profitability index is also known as \_\_\_\_\_ ratio.
- (d) The simplest capital budgeting technique is \_\_\_\_\_.
- (e) Net present value of inflows is calculated by deducting \_\_\_\_\_ from the total \_\_\_\_\_.

2. *State whether the following statements are true or false:*

- (a) Payback period method measures the true profitability of a project.
- (b) Internal rate of return and time adjusted rate of return are the same.
- (c) Capital rationing and capital budgeting mean the same thing.
- (d) Rate of return method takes into account the time value of money.
- (e) Net present value method takes into account the earnings over the entire life of the project.

**Review Questions**

- 1. What is investment decision?
- 2. Explain the meaning of capital budgeting.
- 3. What is cut off rate?
- 4. Define payback period
- 5. What is ARR?
- 6. What is NPV?
- 7. What is IRR?
- 8. Name traditional methods of project evaluation.

9. What is discounted cash flow?
10. Name any two DCF methods of project appraisal.
11. State the importance of capital budgeting.
12. What is payback period? State its merits and demerits.
13. State merits and demerits of ARR.
14. List the merits and demerits of NPV.
15. What is IRR? State its merits and demerits.
16. Explain the profitability index.
17. Discuss the different methods of capital budgeting.
18. Describe the factors determining the capital budgeting decisions.

### Exercises

1. A company wishes to invest ₹ 4,00,000. The following proposals are received:

<i>Projects</i>	<i>Initial Outlay</i>	<i>Annual Cash Inflow</i>	<i>Life in Years</i>
A	2,00,000	50,000	5
B	1,60,000	54,000	6
C	80,000	20,000	13
D	2,00,000	45,000	20
E	40,000	20,000	2

Rank these projects under the payback period. Also suggest which of these projects should be selected.

2. A company has the following two proposals:

<i>Particulars</i>	<i>Project X</i>	<i>Project Y</i>
Initial investments	2,00,000	3,00,000
Estimated life in years	4 years	5 years
Estimated scrap value	Nil	Nil
Project net income, after depreciation and taxes		
1st year	20,000	30,000
2nd year	15,000	30,000

*Contd.*

3rd year	15,000	20,000
4th year	10,000	10,000
5th year	Nil	10,000

The required rate of return is 12%. Which project would you recommend?

3. Mountain Resorts Ltd. is interested in purchasing a machine. Two types of machines are available, machine X and Y. The cost of both the machines is ₹ 2,00,000 each. Their expected life is 5 years. The expected net profits after depreciation but before tax are as follows:

<i>Estimated Net Profit</i>	<i>Machine X</i>	<i>Machine Y</i>
1st year	20,000	14,000
2nd year	30,000	26,000
3rd year	26,000	30,000
4th year	40,000	50,000
5th year	34,000	40,000

Average rate of tax is 50%. From the above information, which machine is more profitable? The cut off rate of return on investment is 15%.

4. Sangam Hotels is considering two mutually exclusive projects. Both require an initial outlay of ₹ 5,00,000 each and have a life of 5 years. The cost of capital is 10% and the tax rate is 50%. Depreciation is charged on straight line method. The estimated cash inflow before depreciation and tax of the two projects are as follows:

<i>Years</i>	<i>Project A</i>	<i>Project B</i>
1	2,00,000	3,00,000
2	2,20,000	2,70,000
3	2,80,000	2,20,000
4	2,50,000	2,50,000
5	3,00,000	2,00,000

Which project do you recommend under NPV method and profitability index method? PV factor at 10% for 5 years is 0.909, 0.826, 0.751, 0.683 and 0.621, respectively.

5. As a finance manager of a company, you are requested to advise the board of directors on choosing two project proposals under NPV method which require an investment of ₹ 2,00,000 and are expected to generate the following cash flow:

<i>Years</i>	<i>Project 1</i>	<i>Project 2</i>
1	96,000	40,000
2	64,000	48,000
3	40,000	72,000
4	Nil	96,000
5	48,000	32,000
6	24,000	16,000

The cost of capital is 10% p.a. The PV factor at 10% for 6 years is 0.909, 0.826, 0.751, 0.683, 0.621 and 0.564 from one to six years.

6. A company is planning to invest ₹ 6,00,000 on machinery whose life is only four years. Estimated net annual cash flow is as follows:

1st year	1,50,000
2nd year	2,00,000
3rd year	3,00,000
4th year	2,00,000

Find out IRR, using PV factor at 10%, 12% and 15%.

The initial investment is ₹ 6,00,000. The NPV at 10% is ₹ 6,63,450, 12% is ₹ 6,34,150, and at 15% is ₹ 5,93,500. Therefore, IRR should be between 12% and 15%.

7. A firm is considering two months exclusive projects X and Y. Both the projects require an initial investment of ₹ 7,00,000 each. The cash inflow is as follows:

<i>Years</i>	<i>Project M</i>	<i>Project N</i>
1	1,00,000	4,00,000
2	2,00,000	3,00,000
3	2,50,000	2,00,000
4	3,00,000	1,00,000
5	3,00,000	1,00,000

Compute the IRR for both the project and suggest which are profitable under (i) NPV at 10% and (ii) IRR method.

<i>Years</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
PV factor at 10%	0.909	0.826	0.751	0.683	0.621
PV factor at 20%	0.833	0.694	0.579	0.482	0.402

8. A firm is contemplating to invest in a project. It has two mutually exclusive alternatives, Projects M and N. The firm has ₹ 10,00,000 to invest. The following are the cash flows for 5 years.

<i>Years</i>	<i>Project M</i>	<i>Project N</i>
1	1,00,000	3,00,000
2	2,00,000	3,00,000
3	3,00,000	3,00,000
4	4,00,000	3,00,000
5	5,00,000	3,00,000

Evaluate the alternatives under:

- NPV at 10%
- Profitability index method
- IRR method.

<i>Years</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
P.V. factor at 10%	0.909	0.826	0.751	0.683	0.621
P.V. factor at 20%	0.833	0.694	0.579	0.482	0.402

9. The following two projects P and Q require an initial investment of ₹ 2,00,000. The income from these projects after taxes and before depreciation is as follows:

<i>Years</i>	<i>Project P</i>	<i>Project Q</i>
1	80,000	20,000
2	80,000	40,000
3	60,000	60,000
4	40,000	80,000
5		80,000

Determine which of the above project is preferred under the following methods:

- Payback period method
  - Average rate of return method
  - NPV at 10%
  - Internal rate of return method.
10. Modern Hotels Ltd. is considering the purchase of a machine. Two machines A and B are available, each costing ₹ 50,000. In comparing the profitability of these machines, a discount rate of 10% is to be used. Earnings after taxation are expected to be as follows:

Years	Cash Flow	
	Machine A	Machine B
1	15,000	5000
2	20,000	15,000
3	25,000	20,000
4	15,000	30,000
5	10,000	20,000

You are also given the following data:

Years	1	2	3	4	5
P.V. factor at 10%	0.909	0.826	0.751	0.683	0.621

Evaluate the proposals using:

- (i) Payback period
- (ii) Accounting rate of return
- (iii) Net present value and the profitability index.

11. Ophelia Restaurant Company Ltd. is considering the purchase of the two machines with the following details:

	Cash Flow	
	Machine A	Machine B
Life	3 years	3years
Capital cost	₹ 1,00,000	₹ 1,00,000
Earnings (after tax) Year		
1	80,000	20,000
2	60,000	70,000
3	40,000	1,00,000

Estimate the profitability of the two machines under:

- (i) Payback method
- (ii) Return on investment method.

# 12

## Chapter

# Dividend Decisions

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and definition of dividend
- Different types of dividends
- Meaning of dividend policy
- Determinants of dividend policy
- Types of dividend policies

### INTRODUCTION

The term *dividend* refers to that part of profits of a company which is distributed by the company among its shareholders. It is the reward of the shareholders for investments made by them in the shares of the company. The investors are interested in earning the maximum return on their investments and to maximize their wealth. A company, on the other hand, needs to provide funds to finance its long-term growth. If a company pays out as dividend most of what it earns, then for business requirements and further expansion, it will have to depend upon outside resources such as issue of debt or new shares. The dividend policy of a firm, thus, affects both the long-term financing and the wealth of shareholders. As a result, the firm's decision to pay dividends must be reached in such a manner so as to equitably apportion the distributed profits and retained earnings. Since dividend is a right of shareholders to participate in the profits and surplus of the company for their investment in the share capital of the company, they should receive a fair amount of the profits. The company should, therefore, distribute a reasonable amount as dividends to its members and retain the rest for its growth and survival.

## MEANING OF DIVIDEND

Dividend is that portion of profits of a company which is distributable among its shareholders according to the decision taken and resolution passed in the meeting of Board of Directors. This may be paid as a fixed percentage on the share capital contributed by them or at a fixed amount per share. The decision for distributing or paying dividend is taken in the meeting of Board of Directors and is confirmed generally by the annual general meeting of the shareholders. Dividend can be declared only out of divisible profits, remaining after setting off all the expenses, transferring reasonable amount of profit to reserve fund and providing for depreciation and taxation for the year. It means if in any year there is no profit, dividend shall not be distributed that year. The shareholders cannot insist upon the company to declare dividend. It is solely the discretion of the directors.

According to the Institute of Chartered Accountants of India, dividend is “a distribution to shareholders out of profits or reserves available for this purpose.”

## DIFFERENT TYPES OF DIVIDENDS

### Cash Dividend

This is the most popular form of dividend. In cash dividend, shareholders are paid dividend in cash. Sometimes, it is supplemented by bonus. The company must have sufficient cash balance in its bank account for the payment of dividend. If the company follows the stable dividend policy, it should prepare a cash budget for the coming period to allocate the necessary funds, which would be needed to meet the regular dividend payments of the company.

### *Regular Dividend*

It is paid annually, proposed by the board of directors and approved by the shareholders in the general meeting. It is also called *final dividend* because it is usually paid after the finalization of accounts.

### *Interim Dividend*

If Articles of Association of the Company so permit, the directors may decide to pay dividend at any time between the two annual general meetings before finalizing the accounts. It is generally declared and paid when the company has earned heavy profits or abnormal profits during the year and directors wish to pay the profits to shareholders.

### Stock Dividend

Companies not having good cash position generally pay dividend in the form of shares by capitalizing the profits of current year and of past years. When dividend is paid in form of shares, these shares are called *bonus shares*. Basically, there is no change in the equity of shareholders. Certain guidelines have been issued by the Company Law Board in respect of bonus shares.

### Scrip Dividend

Scrip dividends are used when earnings justify dividend, but the cash position of the company is temporarily weak. So, shareholders are issued shares or debentures of other companies held



by the company as investment. Such payment of dividend is called *scrip dividend*. Shareholders generally do not like such dividend because the shares or debentures so paid are worthless for the shareholders, as directors would use only such investments which they found were not good. Such dividend was allowed before passing of the Company's Act 1960, but thereafter this unhealthy practice was stopped.

### **Bond Dividend**

In rare instances, dividends are paid in the form of debentures or bonds or notes for a long-term period bearing interest at a fixed rate. The effect of such dividend is the same as that of paying dividend in scrip. The shareholders become the secured creditors if the bonds have a lien on assets.

### **Property Dividend**

Sometimes, dividend is paid in the form of asset instead of cash. The distribution of dividend is made whenever the asset is no longer required in the business such as investment or stock of finished goods.

## **DIVIDEND POLICY**

One of the functions of financial manager is to take dividend decision. The financial manager of a company is required to decide as to what portion of the profit of the company is to be paid to the shareholders as dividend, and what portion of the profit is to be retained as retained earnings. The dividend decision of the financial manager is related to the dividend policy of the management. So, it is necessary to have some idea about dividend policy.

### **Meaning of Dividend Policy**

It is the policy of the management of a company concerning the portion of earnings or profits to be distributed to the shareholders as dividend, and the portion of profits to be retained in the company as retained earnings. In short, it is the policy of the management of a company concerning the amount of profit to be distributed to the shareholders as dividends. In other words, dividend policy means formulation of a policy by the company regarding payment of dividend to shareholders year to year. It determines the ratio between dividend and the retained earnings.

### **Determinants of Dividend Policy**

The payment of dividend involves some legal as well as financial considerations. It is difficult to determine a general dividend policy, which can be followed by different firms at different times because the dividend decision has to be taken considering the special circumstances of an individual case. The following are the important factors which determine the dividend policy of a firm:

#### ***Legal Restrictions***

The dividend policy of a company has to be formulated within the legal framework and restrictions. That means, legal restrictions influence the dividend policy of a company. (a) The board of

directors of a company is not legally bound to declare dividends. (b) Under Section 205 of the Companies Act, dividend should be paid only out of the current profits or the past profits after charging depreciation. (c) Dividend must be paid only in cash. (d) There are also some restrictions under the Income Tax Act on the payment of dividend.

### ***Age of the Company***

The age of the company also influences the dividend decision of a company. A newly established concern has to limit payment of dividend and retain substantial part of earnings for financing its future growth and development, while older companies which have established sufficient reserves can afford to pay liberal dividends.

### ***Nature of Industry***

The nature of industry to which the company is engaged also considerably affects the dividend policy. Certain industries have a comparatively steady and stable demand irrespective of the prevailing economic conditions. For instance, people used to drink liquor both in boom and in recession. Such firms expect regular earnings and hence can follow a consistent dividend policy. On the other hand, if the earnings are uncertain, as in the case of luxury goods, conservative policy should be followed. Such firms should retain a substantial part of their current earnings during boom period in order to provide funds to pay adequate dividends in the recession periods. Thus, industries with steady demand of their products can follow a higher dividend payout ratio, while cyclical industries should follow a lower payout ratio.

### ***Taxation Policy***

The taxation policy of the government also affects the dividend decision of a firm. A high or low rate of business taxation affects the net earnings of a company and thereby its dividend policy. Similarly, a firm's dividend policy may be dictated by the income tax status of its shareholders. If the dividend income of shareholders is heavily taxed being in high-income bracket, the shareholders may forego cash dividend and prefer bonus shares and capital gains.

### ***Government Policy***

The earning capacity of the enterprises is widely affected by the change in industrial, labour, control and other government policies. Sometimes, the government restricts the distribution of dividend beyond a certain percentage in a particular industry or in all spheres of business activity as was done by the government of India in emergency. The dividend policy has to be modified or formulated accordingly.

### ***Future Financial Requirements***

It is not only the desires of the shareholders but also future financial requirements of the company that have to be taken into consideration while making a dividend decision. The management of a concern has to reconcile the conflicting interests of shareholders and those of the company's financial needs. If a company has highly profitable investment opportunities, it can convince the shareholders of the need for limitation of dividend to increase the future earnings and stabilize its financial position.

### ***Policy of Control***

When a company pays high dividend out of its earnings, it may result in the dilution of both control and earnings for the existing shareholders. As in the case of a high dividend payout ratio, the retained earnings are insignificant and the company will have to issue new shares to raise funds to finance its future requirements. The control of the existing shareholders will be diluted if they cannot buy the additional shares issued by the company. Similarly, issue of new shares shall cause increase in the number of equity shares and ultimately cause a lower earnings per share and their price in the market. Thus, under these circumstances, to maintain control of the existing shareholders, it may be desirable to declare lower dividends and retain earnings to finance the firm's future requirements.

### ***Stability of Dividends***

Stability of dividends is another important guiding principle in the formulation of a dividend policy. Stability of dividend simply refers to the payments of dividend regularly, and shareholders, generally, prefer payment of such regular dividends. Some companies follow a policy of constant dividend per share while others follow a policy of constant payout ratio and while there are some others who follow a policy of constant low dividend per share plus an extra dividend in the years of high profits.

### ***Needs for Additional Capital***

Companies retain a part of their profits for strengthening their financial position. The income may be conserved for meeting the increased requirements of working capital or of future expansion. Small companies usually find difficulties in raising finance for their needs of increased working capital for expansion programmes. They, having no other alternative, use their ploughed back profits. Thus, such companies distribute dividend at low rate and retain a big part of profits.

### ***Liquidity of Funds***

Availability of cash and sound financial position is also an important factor in dividend decisions. Dividend represents cash outflow, the greater the funds and the liquidity of the firm, the better the ability to pay dividend. The liquidity of a firm depends very much on the investment and financial decisions of the firm, which, in turn, determine the rate of expansion and the manner of financing. If cash position is weak, stock dividend will be preferred and if cash position is good, a company can distribute cash dividend.

### ***State of Capital Market***

If the capital market position is comfortable in the country and the funds may be raised from different sources without much difficulty, the management may be tempted to declare a high rate of dividend to attract the investors and maintain the existing shareholders. Contrarily, if there is a slump in the stock market and the stockholders are not interested in making the investment in securities, the management should follow a conservative dividend policy by maintaining a low rate of dividend and ploughing back a sizable portion of profits to face any contingency. Likewise, if the term lending financial institutions advance loans on stiffer terms, it may be desirable to rely on internal sources of financing, and accordingly conservative dividend policy should be pursued.

### ***Regularity in Dividend Payment***

Dividends should be paid regularly because each investor is interested in the regular payment of dividend. The management should, in spite of regular payment of dividend, consider that the rate of dividend should be almost constant. For this purpose, sometimes companies maintain dividend equalization fund.

### ***Stability of Earnings***

The nature of business has an important bearing on the dividend policy. Industrial units having stability of earnings may formulate a more consistent dividend policy than those having an even flow of incomes because they can predict easily their savings and earnings. Usually, enterprises dealing in necessities suffer less from oscillating earnings than those dealing in luxuries or fancy goods.

### ***Types of Dividend Policies***

The various types of dividend policies are as follows.

#### ***Stable Dividend Policy***

Under this policy, stable or almost stable rate of dividend is maintained. The company maintains reserves in the years of prosperity and uses them in paying dividend in lean years. If the company follows stable dividend policy, the market price of its shares shall be higher. There are several reasons why investors prefer stable dividend policy. The main reasons are (a) Confidence among shareholders, (b) Income conscious investors, (c) Stability in market price of shares and (d) Encouragement to institutional investors.

#### ***Policy of Regular Stock Dividend***

Under this policy, the company pays dividend in the form of bonus shares instead of cash. It does not affect the liquidity at all, but increases the shareholdings of the shareholders. The policy can be justified in the following circumstances: (i) The company has earnings but it needs cash to cover its modernization and expansion scheme, and (ii) The firm is deficient of cash despite high earnings.

#### ***Policy of Pay Irregular Dividend***

Companies following this policy take a lenient view of dividend and pay the dividend in correspondence with the changing level of earnings. The large is the earnings, the large is the dividend and vice versa. This policy is based on the belief of the management that shareholders are entitled to as much dividend as the firm's earnings and the cash position warrants. Generally, this policy of dividend is followed by companies having irregular earnings.

#### ***Policy of No Immediate Dividend***

Very often, the company decides to pay no dividend despite large amount of profits. This policy is generally pursued in the following circumstances:

- (i) The company is new and growing and requires huge funds to finance its growing needs.

- (ii) When the firm's access to capital market is difficult or cost of finance is costliest.
- (iii) Shareholders are willing to wait for long for a return on their investment and, in the meantime, are content to have their holdings appreciate in value.

### Objective Type Questions

1. *Fill in blanks:*
  - (a) \_\_\_\_\_ is the distribution of profits of a company among its shareholders.
  - (b) Dividend policy of a firm affects both the long term financing and \_\_\_\_\_.
  - (c) \_\_\_\_\_ dividend promises to pay the shareholders at a future date.
  - (d) \_\_\_\_\_ dividend is a usual method of paying dividend.
  - (e) According to \_\_\_\_\_ model, the dividend decision is irrelevant.
2. *State whether the following statements are true or false:*
  - (a) Payment of dividend involves legal as well as financial considerations.
  - (b) Stock dividend affects the liquidity position of the company.
  - (c) The issue of bonus shares amounts to a corresponding increase in the paid-up capital of the company.
  - (d) The declaration of bonus issue in lieu of dividend is allowed.
  - (e) Bonus shares are not permitted unless the partly paid shares, if any, are made full paid.

### Review Questions

1. What is dividend decision?
2. Define the term 'dividend.'
3. Define dividend policy.
4. What do you mean by stock dividend?
5. What do you mean by cash dividend?
6. Explain the different forms of dividend.
7. Explain the nature of dividend decision.
8. Define dividend policy. Explain the factors that determine dividend policy.
9. Explain the different types of dividend policy.

# 13

## Chapter

# Working Capital Management

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning and components of working capital
- Trade-off on working capital financing
- Kinds of working capital and determinants of working capital requirements
- Working capital needs of a business
- Working capital cycle
- How to calculate working capital requirement

### MEANING OF WORKING CAPITAL

The term ‘working capital’ refers to the amount of capital which is readily available to an organization. To understand the concept of working capital, one needs to understand two basic concepts, namely current assets and current liabilities. Current assets are resources which are in cash or will soon be converted into cash in “the ordinary course of business”. These consist of the following:

#### ***Inventories/Stock***

It consists of raw materials and components, work-in-progress and finished goods.

#### ***Trade Debtors/Receivables***

These consist of credit sales to customers.

#### ***Prepaid Expenses***

These are the payments made for goods or services whose benefits are yet to be received.

### ***Loan and Advances***

These are short-term loans and advances given by the firm to other firms.

### ***Investments***

These are short-term surplus funds invested in government securities, shares and short-term bonds.

### ***Cash and Bank Balance***

**Current liabilities** are commitments which will soon require cash settlement in “the ordinary course of business”. The current liabilities of a firm are the liabilities that are expected to become due within a year.

They comprise the following:

#### ***Sundry Creditors/Payables***

These arise when the firm buys raw materials on credit.

#### ***Bank Overdraft***

This is a short-term loan facility offered by the bank for the day-to-day operations.

#### ***Short-term Loans***

They comprise short-term borrowings from banks.

#### ***Provisions***

These include provisions for taxation, proposed dividends, etc.

#### ***Accounts Payable***

These arise in the normal course of doing business; firms accrue wages and salaries to their employees, taxes, etc.

#### ***Current Portion of Long-term Debt***

Any long-term debt which is to be paid within the year is classified as current liability.

**Gross working capital** comprises current assets. **Net working capital**, often referred to as just working capital, is the excess of current assets over current liabilities. Working capital is the difference between resources in cash or readily convertible into cash (current assets) and organizational commitments for which cash will soon be required (current liabilities).

### **TRADE-OFF ON WORKING CAPITAL FINANCING**

A major decision faced by the business units is how much working capital to hold. Having a large working capital on hand will reduce the risk of liquidity but, on the other hand, this cash can be used for some other productive purposes. So, deciding on the optimum quantum of working capital is a major decision.

The effect of working capital changes on cash flows will depend on a number of factors, including the following.

## Magnitude of Working Capital Investment Needed for Operations

The effects of working capital changes on cash flows are likely to be more for firms that have to maintain large investments in working capital relative to operating cash flows and sales. For example, an automobile dealer will have more changes in cash flow if he sells a car than a textile merchant who sells his merchandise and reduces his inventory.

## Components of Working Capital

Not all the components affect the cash flow drastically. Some components actually increase the cash flow of the concern like the marketable securities which increase the cash flow by earning a return (interest or dividends on these securities). Increases in inventory, on the other hand, have a more negative impact on cash flows because they do not have any returns but involve more cost for storage and administration.

Excess of working capital will result in the following:

- (a) It results in unnecessary accumulation of inventories. The cost of administration and storage increases and the chances of inventory mishandling, waste, theft and losses also increase.
- (b) It indicates either a defective credit policy or/and slack collection period.
- (c) The management may become complacent, resulting in managerial inefficiency.
- (d) Accumulating inventories may be for speculation activities.

Inadequate working capital will result in the following:

- (a) Growth gets stagnated.
- (b) The firm cannot achieve its profits as it is difficult to implement the operating plans.
- (c) Meeting the day-to-day commitments may become a difficult task.
- (d) Fixed assets cannot be utilized and profitability will get affected.
- (e) The firm may have to resort to short-term borrowings at higher interest rates.
- (f) The firm loses its reputation when it is not in a position to honour its short-term obligations.

## KINDS OF WORKING CAPITAL

Working capital is of two types—permanent and temporary.

### Permanent Working Capital

This is the part of the working capital which consists of current assets that are required on a continuing basis throughout the year and for several years. It is the minimum amount of current assets which is needed to conduct a business even during the off-season period. The minimum level of current assets is called *permanent* or *fixed working capital* as this part is permanently blocked in current assets. This amount varies from year to year, depending upon the growth of the company and the stage of the business cycle in which it is. It is the amount of funds required to produce the goods and services which are necessary to satisfy demand at a particular point of time. Permanent working capital is classified on the basis of time period and increases in size with the growth of business operations. It changes from one asset to another asset.



## Temporary Working Capital

Temporary working capital represents a certain amount of fluctuations in the total current assets during a short period. These fluctuations are increased or decreased and are generally cyclical in nature. Additional current assets are required at different times during the operating year. Variable working capital is the amount of additional current assets that are required to meet the seasonal needs of a firm, so it is also called *seasonal working capital*. Additional inventory will be required for meeting the demand during the peak period of sales. When the sale falls and the off season starts, variable working capital decreases as the need for inventory decreases. It is temporarily invested in current assets. For example, firms dealing in seasonal products like woolen clothes will stock up more during the winter season and reduce their inventory during the summer season. Permanent working capital is not usefully employed though it may change from one asset to another asset like permanent working capital does. This is suitable for firms with seasonal nature of business.

## DETERMINANTS OF WORKING CAPITAL REQUIREMENTS

The following are the determinants of working capital requirements.

### Nature of Business

The working capital requirements depend basically on the nature of the business. Public utility undertakings like Electricity, Water supply, Railways, etc. need very limited working capital because they offer cash sales only and supply services, not products, and as such no funds are tied up in inventories and receivables. But, at the same time, they have to invest fewer amounts in fixed assets. Supermarkets and restaurants also offer products and services on cash basis and the amount of receivables is almost nonexistent. Manufacturing concerns, on the other hand, require sizable working capital along with fixed investments, as they have to build up the inventories.

### Terms of Sales and Purchases

The terms of credit sales granted by the firm to its customers as well as credit terms granted by the suppliers also affect the working capital. If the credit terms of the purchases are more favourable and at the same time those of sales less liberal, less cash will be invested in the inventory. With more favourable credit terms, working capital requirements can be reduced.

### Manufacturing Cycle

The length of manufacturing cycle influences the quantum of working capital needed. Manufacturing process always involves the time taken for raw materials to be converted into the final product. The length of the manufacturing process depends upon the nature of the product and the production technology used by a concern. The shorter the manufacturing cycle, the lesser the working capital required.

### Rapidity of Turnover

If the inventory turnover is high, the working capital requirements will be low. Good inventory control helps a firm to reduce its working capital requirements. ABC Analysis, VED Analysis and

Stock level management are some of the techniques available for inventory control. But when a firm has to carry a large quantity of slow moving stock, the working capital need is more.

### **Business Cycle**

Changes taking place in the economy also affect the amount of working capital required by the firm. When the industry is facing a boom, then sales increases and there is a need for larger working capital. On the other hand, when it is a slump period i.e., sales drop, working capital requirement decreases.

### **Changes in Technology**

Technological improvements and innovations result in quicker production processes and less wastage. This helps the firm to reduce its inventory holdings, which reduces working capital.

### **Seasonal Variation**

Supply of raw materials, spares and stores also affect the working capital. If the supply is prompt and adequate, the firm can manage with small inventory. However, if the supply is unpredictable, seasonal or scant, then the firm has to carry its inventory to ensure uninterrupted production.

### **Market Conditions**

The competition prevailing in the marketplace also influences the working capital needs. When there are many competitors in the market, the firm has to carry a larger stock to serve the customers promptly, as they may not like to wait with so many other manufacturers available.

### **Seasonality of Operation**

Firms which are manufacturing seasonal goods need to carry more stock during peak season. For example, a firm dealing with woollen goods has to carry more stock during the winter season. So, the working capital increases during the winter season and decreases during summer.

### **Dividend Policy**

Working capital position is greatly influenced by the dividend policy of the firm. If the firm is following a conservative dividend policy, then working capital needs can be met through retained earnings.

### **Working Capital Cycle**

The larger the working capital cycle, the more is the requirement of working capital.

## **WORKING CAPITAL NEEDS OF A BUSINESS**

Different industries have different optimum working capital profiles, reflecting their methods of doing business and what they are selling.

- Businesses with a lot of cash sales and few credit sales should have minimal trade debtors. Supermarkets are good examples of such businesses.

- Businesses that exist to trade in completed products will only have finished goods in stock. Compare this with manufacturers who will also have to maintain stocks of raw materials and work-in-progress.
- Some finished goods, notably foodstuffs, have to be sold within a limited period because of their perishable nature.
- Larger companies may be able to use their bargaining strength as customers to obtain more favourable, extended credit terms from suppliers. By contrast, smaller companies, particularly those that have recently started trading (and do not have a track record of credit worthiness), may be required to pay their suppliers immediately.
- Some businesses will receive their monies at certain times of the year, although they may incur expenses throughout the year at a fairly consistent level. This is often known as “seasonality” of cash flow. For example, travel agents have peak sales in the weeks immediately following Christmas.

Working capital needs also fluctuate during the year. The amount of funds tied up in working capital would not typically be a constant figure throughout the year. Only in the most unusual of businesses would there be a constant need for working capital funding. For most businesses, there would be weekly fluctuations. Many businesses operate in industries that have seasonal changes in demand. This means that sales, stocks, debtors, etc. would be at higher levels at some predictable times of the year than at others.

In principle, the working capital need can be separated into two parts:

- Fixed part
- Fluctuating part

The fixed part is probably defined in amount as the minimum working capital requirement for the year. The more permanent needs (fixed assets and the fixed element of working capital) should be financed from fairly permanent sources (e.g. equity and loan stocks); the fluctuating element should be financed from a short-term source (e.g. a bank overdraft), which can be drawn on and repaid easily and at a short notice.

## **WORKING CAPITAL CYCLE**

The working capital cycle, also called the *Operating Cycle*, can be defined as the period of time required to convert cash into raw materials, raw materials into inventory finished goods, finished goods inventory into sales and accounts receivable, and accounts receivable into cash. The operating cycle of a manufacturing company involves three phases: (i) Acquisition of resources: such as raw material, labour, power and fuel etc. (ii) Manufacture of the product: This includes conversion of raw material into work-in-progress, then into finished goods. (iii) Sales of the product: either for cash or on credit. Credit sales create account receivable for collection. In every business, all these have an impact of cash inflows. Cash outflows always occur before cash inflows. Cash outflows are more predictable than inflows. So, the firm is to have adequate current assets. Current assets provide the necessary liquidity for uninterrupted business activities. It needs to maintain liquidity to purchase raw materials and pay expenses such as wages and salaries, other manufacturing, administrative and selling expenses and taxes. All these payments have to be made

on time. Cash balance is also required to meet the day-to-day expenses and emergencies that may arise. Stocks of raw material and work-in-process are kept to ensure smooth production. The firm holds stock of finished goods to meet the demands of customers promptly as and when they arise. When goods are sold on credit, debtors (accounts receivable) are created. Goods are sold on credit for marketing and competitive reasons. Thus, a firm makes adequate investment in inventories and debtors for smooth, uninterrupted production and sale.

### Length of an Operating Cycle

The length of the operating cycle of a manufacturing firm is the sum of:

- (i) Inventory conversion period (ICP)
- (ii) Debtors' conversion period (DCP).

The inventory conversion period is the total time needed for producing and selling the product, which includes:

- (a) Raw material conversion period (RMCP)
- (b) Work-in-process conversion period (WIPCP)
- (c) Finished goods conversion period (FGCP).

The debtors' conversion period is the time required to collect the outstanding amount from the customers.

The total of inventory conversion period and debtors' conversion period is referred to as *gross operating cycle* (GOC). In practice, a firm may acquire resources (such as raw materials) on credit and temporarily postpone payment of certain expenses. Payables, which the firm can defer, are spontaneous sources of capital to finance investment in current assets. The payables deferral period (PDP) is the length of time the firm is able to defer payments on various resource purchases. The difference between (gross) operating cycle and payable deferral period is net operating cycle (NOC).

- The chain starts with the firm buying raw materials on credit.
- In due course, this stock will be used in production, work will be carried out on the stock, and it will become part of the firm's work-in-progress (WIP).
- Work will continue on the WIP until it eventually emerges as the finished product.
- As production progresses, labour costs and overheads will need to be met.
- Of course, at some stage, trade creditors will have to be paid.
- When the finished goods are sold on credit, debtors are increased.
- They will eventually pay, so that cash will be injected into the firm.

Each of the areas—stocks (raw materials, work-in-progress and finished goods), trade debtors, cash (positive or negative) and trade creditors—can be viewed as tanks into and from which funds flow.

Working capital is clearly not the only aspect of a business that affects the amount of cash:

- The business will have to make payments to government for taxation.
- Fixed assets will be purchased and sold.
- Lessors of fixed assets will be paid their rent.

- Shareholders (existing or new) may provide new funds in the form of cash.
- Some shares may be redeemed for cash.
- Dividends may be paid.
- Long-term loan creditors (existing or new) may provide loan finance, loans will need to be repaid from time to time.
- Interest obligations will have to be met by the business.

Unlike movements in the working capital items, most of these ‘non-working capital’ cash transactions are not everyday events. Some of them are annual events (e.g. tax payments, lease payments, dividends, interest and, possibly, fixed asset purchases and sales). Others (e.g. new equity and loan finance and redemption of old equity and loan finance) would typically be rarer events.

### Statement Showing the Details of Calculating Working Capital Required

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Cash	XXXXX
Debtors or Receivable (For... month's sales)	XXXXX
Stock (For... Month's sales)	XXXXX
Advance payments, if any	XXXXX
Total current assets	XXXXX
<i>Less: Current Liabilities</i>	
Creditors	XXXXX
Lag in payment of expenses (Outstanding expenses, if any)	XXXXX
<b>Working Capital (CA – CL)</b>	XXXXX
<i>Add: Contingencies/Provision</i>	XXXXX
<b>Working Capital required</b>	XXXXX

### Statement of Working Capital Requirements

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
(i) Stock of raw material (for... months consumption)	xxx
(ii) Work-in-process (for... Months)	
(a) Raw materials	xxx
(b) Direct labour	xxx
(c) Overheads	xxx

*Contd.*

(iii) Stock of finished goods (for... months sales)	
(a) Raw materials	xxx
(b) Direct labour	xxx
(c) Overheads	xxx
(iv) Sundry debtors or receivables (for... months sales)	
(a) Raw materials	xxx
(b) Direct labour	xxx
(c) Overheads	xxx
(v) Payments in advance (if any)	xxx
(vi) Balance of cash (required to meet day-to-day)	xxx
(vii) Any other (if any)	xxx
<i>Less: Current Liabilities</i>	
(i) Creditors (for... months purchases of raw materials)	xxx
(ii) Lag in payment of expenses (outstanding expenses... months)	xxx
(iii) Others (if any)	xxx
<b>Working capital (CA – CL)</b>	xxx
<i>Add: Provision/Contingencies</i>	xxx
<b>Net Working Capital Requirement</b>	xxx

## ILLUSTRATIONS

1. Prepare an estimate of working capital requirement from the following information of a trading concern:

Project annual sales	1,00,000 units
Selling price	₹ 8 pre unit
Percentage net profit on sales	25%
Average credit period allowed to customers	8 weeks
Average credit period allowed by suppliers	4 weeks
Average stock holding in terms of sales requirement	12 weeks
Allow 10% for contingencies.	

### Note:

- Step 1: Classify the given information into current assets and current liabilities.
- Step 2: Calculate the cost of sales and find out the components of current assets. This is being done by excluding the percentage of profit out of sales.
- Step 3: While calculating working capital, profit is not considered because profit is not used as working capital.

**Solution:****Statement Showing the Details of Calculating Working Capital Required**

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Debtors: $6,00,000 \times 8/52$	92,308
Stock: $6,00,000 \times 12/52$	1,38,462
Total current assets	2,30,770
<i>Less:</i> Current Liabilities	
Creditors: $6,00,000 \times 4/52$	46,154
Net working capital	1,84,616
<i>Add:</i> 10% Contingencies	18,462
Working capital required	2,03,078

**Working Note:** Calculation of cost of sales

Sales	8,00,000
<i>Less:</i> Profit $8,00,000 \times 25/100$	2,00,000
<b>Cost of Sales</b>	<b><u>6,00,000</u></b>

2. Prepare an estimate of working capital requirement from the following information of a trading concern:

Project annual sales	1,20,000 units
Selling price	₹ 10 per unit
Percentage net profit on sales	30%
Average credit period allowed to customers	10 weeks
Average credit period allowed by suppliers	5 weeks
Average stock holding in terms of sales requirement	5 weeks
Allow 15% for contingencies.	

**Solution:****Statement Showing the Details of Calculating Working Capital Required**

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Debtors: $8,40,000 \times 10/52$	1,61,538
Stock: $8,40,000 \times 5/52$	80,769
Total current assets	2,42,307

*Contd.*

<i>Less:</i> Current Liabilities	
Creditors: $8,40,000 \times 5/52$	80,769
	1,61,538
<i>Add:</i> 15% Contingencies	24,231
Working capital required	1,85,769

**Working Note:** Calculation of cost of sales

Sales	12,00,000
<i>Less:</i> Profit $12,00,000 \times 30/100$	3,60,000
<b>Cost of Sales</b>	<b><u>8,40,000</u></b>

3. Prepare an estimate of working capital requirement from the following information of a trading concern:

Project annual sales	8,00,000 units
Selling price	₹ 8 pre unit
Percentage net profit on sales	20%
Average credit period allowed to customers	10 weeks
Average credit period allowed by suppliers	8 weeks
Average stock holding in terms of sales requirement	10 weeks
Allow 20% for contingencies.	

**Solution:**

**Statement Showing the Details of Calculating Working Capital Required**

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Debtors: $5,12,000 \times 10/52$	98,462
Stock: $5,12,000 \times 10/52$	98,462
Total current assets	1,96,924
<i>Less:</i> Current Liabilities	
Creditors: $5,12,000 \times 8/52$	78,769
Net working capital	1,18,155
<i>Add:</i> 20% Contingencies	23,631
Working capital required	1,41,786



**Working Note:** Calculation of cost of sales

Sales	6,40,000
Less: Profit $6,40,000 \times 20/100$	1,28,000
<b>Cost of Sales</b>	<b><u>5,12,000</u></b>

4. X & Co. is desirous to purchase a business and has consulted you and one point on which you are asked to advise them is the average amount of working capital. You are given the following estimates and are instructed to add 10% contingencies:

(a) Amount blocked up in stocks:	Figures for the years (₹)
Stock of finished goods	5000
Stock of stores, materials	8000
(b) Average credit sales:	
Inland sales—6 weeks credit	3,12,000
Export sales—1½ months	78,000
(c) Lag in payment of wages and other outgoings:	
Wages—1½ weeks	2,60,000
Stock of materials—1½ months	48,000
Rent, Royalties—6 months	10,000
Clerical staff—½ month	62,400
Manager—½ month	4800
Miscellaneous Expenses—1½ months	48,000
(d) Payment in advances:	
Sundry expenses (paid quarterly in advance)	8000
(e) Undrawn profit on the average throughout the year	11,000

**Solution:****Statement Showing the Details of Calculating of Working Capital**

<i>Particular</i>	<i>Amount (₹)</i>	<i>Amount (₹)</i>
<b>Current Assets:</b>		
Stock of finished goods		5000
Stock of stores, materials		8000
<b>Sundry debtors:</b>		
Inland: $3,12,000 \times 6/52$	36,000	
Export: $78,000 \times 6/52$	2250	38,250
<b>Payments in Advance:</b>		
Sundry expenses $8000 \times 1/4$ quarterly		2000
<b>Total current assets</b>		<b>53,250</b>

*Contd.*

<i>Less:</i> Current Liabilities:			
Lag in payment of wages:	$2,60,000 \times 6/52$	7500	
Lag in payment of materials:	$48,000 \times 6/52$	6000	
Rent and royalties	$10,000 \times 6/12$	5000	
Clerical staff	$62,400 \times 2/52$	2600	
Manager's salary	$4800 \times 2/52$	200	
Miscellaneous expenses	$48,000 \times 6/52$	6000	27,300
<b>Net working capital</b>			<b>25,950</b>
<i>Add:</i> 10% contingencies			2595
Working capital requirement			<b>28,545</b>

5. Estimate the working capital requirement from the following information. You are given the following estimates and are instructed to add 20% as contingencies:

- (a) Amount blocked up in stocks: Figures for the years (₹)
- Stock of finished goods 6000
- Stock of stores, materials 10,000
- (b) Average credit sales:
- Inland sales—8 weeks credit 3,00,000
- Export sales—2 months 80,000
- (c) Lag in payment of wages and other outgoings:
- Wages—2 weeks 2,50,000
- Stock of materials—8 months 50,000
- Rent, royalties—6 months 10,000
- Clerical staff—1 month 5000
- Miscellaneous expenses—8 months 50,000
- (d) Payment in advances:
- Sundry expenses (paid quarterly) 10,000

**Solution:**

<i>Particulars</i>	<i>Amount (₹)</i>	<i>Amount (₹)</i>
<b>Current Assets</b>		
Stock of finished goods		6000
Stock of stores, materials		10,000
<b>Debtors:</b>		
Inland sales $3,00,000 \times 8/52$	46,154	
Export sales $80,000 \times 2/52$	3077	49,231

*Contd.*

<b>Payments in advance:</b>		
Sundry expenses $10,000 \times \frac{1}{4}$		2500
<b>Total current assets</b>		67,731
<i>Less:</i> Current Liabilities:		
Wages $2,50,000 \times \frac{2}{52}$	9615	
Stock of materials $50,000 \times \frac{8}{52}$	7692	
Rent, royalties $10,000 \times \frac{6}{12}$	5000	
Clerical staff $5000 \times \frac{4}{12}$	385	
Miscellaneous expenses $50,000 \times \frac{8}{52}$	7692	30,384
Working Capital (CA–CL)		37,347
<i>Add:</i> 20% contingencies		7469
<b>Working capital requirement</b>		44,816

6. A proforma cost sheet of a company provides the following particulars:

Elements of cost	Amount per unit
Materials	40%
Direct labour	20%
Overheads	20%

The following further particulars are available:

- It is proposed to maintain a level of activity of 2,00,000 units.
- Raw materials are expected to remain in stores for an average period of one month.
- Materials will be in process, an average of half a month.
- Selling price is ₹ 12 per unit.
- Finished goods are required to be in stock for an average period of one month.
- Credit allowed to debtors is two months.
- Credit allowed by suppliers is one month.

You may assume that sales and production follow a consistent pattern. You are required to prepare a statement of working capital requirements.

**Solution:**

**Statement Showing the Details Calculations of Net Working Capital**

Particulars	Amount (₹)
<b>Current assets</b>	
Raw material ( $2,00,000 \times 12 \times \frac{40}{100} \times \frac{1}{12}$ )	80,000

*Contd.*

<b>Work-in-process (1/2 Months)</b>	
Raw materials (2,00,000 × 12 × 40/100 × 0.5/12)	40,000
Direct labour (2,00,000 × 12 × 20/100 × 0.5/12)	20,000
Overheads (2,00,000 × 12 × 20/100 × 0.5/12)	20,000
<b>(iii) Stock of finished goods (One month)</b>	
Raw materials (2,00,000 × 12 × 20/100 × 1/12)	80,000
Direct labour (2,00,000 × 12 × 20/100 × 1/12)	40,000
Overheads (2,00,000 × 12 × 20/100 × 1/12)	40,000
<b>(iv) Sundry debtors or receivables (Two months sales)</b>	
Raw materials (2,00,000 × 12 × 40/100 × 2/12)	1,60,000
Direct labour (2,00,000 × 12 × 20/100 × 2/12)	80,000
Overheads (2,00,000 × 12 × 20/100 × 2/12)	80,000
<b>Total Current Assets</b>	<b>6,40,000</b>
<i>Less: current Liabilities:</i>	
Raw materials (2,00,000 × 12 × 40/100 × 1/12)	80,000
<b>Net Working Capital Requirement</b>	<b>5,60,000</b>

7. A proforma cost sheet of a company provides the following particulars:

Elements of cost	Amount per unit
Materials	50%
Direct labour	10%
Overheads	10%

The following further particulars are available:

- It is proposed to maintain a level of activity of 1,00,000 units.
- Selling price is ₹ 12 per unit.
- Raw materials are expected to remain in stores for an average of 2 months.
- Materials will be in process, an average of one month.
- Finished goods are required to be in stock for an average of 2 months.

- (f) Credit allowed to debtors is three months.  
 (g) Credit allowed by suppliers is two months.

You may assume that sales and production follow a consistent pattern. You are required to prepare a statement of working capital requirements.

**Solution:**

**Statement Showing the Details Calculations of Net Working Capital**

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Raw material (1,00,000 × 10 × 50/100 × 2/12)	83,333
<b>Work-in-process (1 month)</b>	
Raw materials (1,00,000 × 10 × 50/100 × 1/12)	41,666
Direct labour (1,00,000 × 10 × 10/100 × 1/12)	8333
Overheads (1,00,000 × 10 × 10/100 × 1/12)	8333
(iii) <b>Stock of finished goods (One month)</b>	
Raw materials (1,00,000 × 10 × 50/100 × 2/12)	83,333
Direct labour (1,00,000 × 10 × 10/100 × 2/12)	16,667
Overheads (1,00,000 × 10 × 10/100 × 2/12)	16,667
(iv) <b>Sundry debtors or receivables (3 months)</b>	
Raw materials (1,00,000 × 10 × 50/100 × 3/12)	1,25,000
Direct labour (1,00,000 × 10 × 10/100 × 3/12)	25,000
Overheads (1,00,000 × 10 × 10/100 × 3/12)	25,000
<b>Total Current Assets</b>	4,33,332
<i>Less: Current Liabilities:</i>	
Raw materials (1,00,000 × 10 × 50/100 × 3/12)	83,332
<b>Net Working Capital Requirement</b>	3,50,000

8. Following is the cost structure of product “M”. You are required to find out the working capital required.

Elements of cost	Amount per unit
Raw material	70
Direct labour	40
Overheads	60
Total cost (cost of product)	170
Add: Profit	30
Selling price	200

The following further particulars are available:

Raw materials are in stock on an average for one month. Materials are in process on an average for half a month. Finished goods are in stock on an average for one month.

Credit allowed by suppliers is one month.

Credit allowed to customers is two months.

Lag in payment of wages is 1½ weeks.

Lag in payment of overhead expenses is one month.

One-fourth of the output is sold against cash. Cash in hand and at bank is expected to be ₹ 20,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 80,000 units of production.

You may assume that production is carried on evenly throughout the year. Wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month.

**Solution:**

#### Statement Showing the Calculations of Working Capital

Particulars	Amount (₹)
<b>Current assets</b>	
Stock of raw materials for 4 weeks (80,000 units × 70 = 56,00,000 × 4/52)	4,30,769
<b>Work-in-process (2 weeks)</b>	
Raw materials (80,000 × 70 × 2/52)	2,15,385
Direct labour (80,000 × 40 × 2/52)	1,23,077
Overheads (80,000 × 60 × 2/52)	1,84,615

Contd.

<b>(iii) Stock of finished goods (4 weeks)</b>		
Raw materials		
(80,000 × 70 × 4/52)		4,30,769
Direct labour		
(80,000 × 40 × 4/52)		2,46,154
Overheads		
(80,000 × 60 × 4/52)		3,69,231
<b>(iv) Sundry debtors (on credit sales)</b>		
Raw materials		
(80,000 × 70 × 8/52 × 3/4)		6,46,154
Direct labour		
(80,000 × 40 × 8/52 × 3/4)		3,69,230
Overheads		
(80,000 × 60 × 8/52 × 3/4)		5,53,846
Cash and bank		20,000
<b>Total Current Assets</b>		35,89,230
<i>Less: Current Liabilities:</i>		
Creditors for 4 weeks (purchase of raw material)		
(80,000 units × 70 = 56,00,000 × 4/52)	4,30,769	
Wages outstanding 1½ weeks		
(32,00,000/52 × 3/2)	92,308	
Lag in payment of overheads for 4 weeks		
(48,00,000 × 4/52)	3,69,231	8,92,308
<b>Net Working Capital Requirement</b>		26,96,922

**Notes:**

1. ¼ for cash sales, remaining ¾ credit sales.
2. While calculating working capital, profit is not considered. Profit is not used as a working capital.

9. A proforma cost sheet of a company provides the following particulars:

<b>Elements of cost</b>	<b>Amount per unit</b>
Raw material	80
Direct labour	30
Overheads	60
Total cost (cost of product)	170
Profit	30
Selling price	200

The following further particulars are available:

- (a) Raw materials are in stock on an average for one month.
- (b) Materials are in process on an average for half a month.
- (c) Finished goods are in stock on an average for one month.
- (d) Credit allowed by suppliers is one month.
- (e) Lag in payment of wages is  $1\frac{1}{2}$  weeks.
- (f) Lag in payment of overhead expenses is one month.
- (g)  $\frac{1}{4}$ th of the output is sold against cash.
- (h) Cash in hand and at bank is expected to be ₹ 25,000.
- (i) Credit allowed to customers is two months.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 1,04,000 units of production.

You may assume that production is carried on evenly throughout the year. Wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month.

**Solution:**

#### Statement Showing the Calculations of Working Capital

<i>Particulars</i>	<i>Amount (₹)</i>
<b>Current assets</b>	
Stock of raw material for 4 weeks (1,04,000 units $\times$ 80 $\times$ 4/52)	6,40,000
<b>Work-in-process (2 weeks)</b>	
Raw materials (1,04,000 $\times$ 80 $\times$ 2/52)	3,20,000
Direct labour (1,04,000 $\times$ 30 $\times$ 2/52)	1,20,000
Overheads (1,04,000 $\times$ 60 $\times$ 2/52)	2,40,000
<b>(iii) Stock of finished goods (4 weeks)</b>	
Raw materials (1,04,000 $\times$ 80 $\times$ 4/52)	6,40,000
Direct labour (1,04,000 $\times$ 30 $\times$ 4/52)	2,40,000
Overheads (1,04,000 $\times$ 60 $\times$ 4/52)	4,80,000
<b>(iv) Sundry debtors (on credit sales)</b>	
Raw materials (1,04,000 $\times$ 80 $\times$ 8/52 $\times$ 3/4)	9,60,000

*Contd.*



Direct labour (1,04,000 × 30 × 8/52 × 3/4)	3,60,000
Overheads (1,04,000 × 60 × 8/52 × 3/4)	7,20,000
Cash in hand at bank	25,000
<b>Total Current Assets</b>	<b>47,45,000</b>
<i>Less: Current Liabilities:</i>	
Creditors for 4 weeks (purchase of raw material) (1,04,000 × 80 × 4/52)	6,40,000
Wages outstanding 1.1/2 weeks (1,04,00,000/30 × 1.5/52)	90,000
Lag in payment of overheads for 4 weeks (1,04,00,000 × 60 × 4/52)	<u>4,80,000</u>
<b>Net Working Capital Requirement</b>	<b>35,35,000</b>

**Notes:**

1. ¼ for cash sales, remaining ¾ credit sales.
2. While calculating working capital, profit is not considered. Profit is not used as a working capital.

**Objective Type Questions**

1. *Fill in the blanks:*
  - (a) Net working capital is the excess of \_\_\_\_\_ over \_\_\_\_\_.
  - (b) Working capital is also known as \_\_\_\_\_ or \_\_\_\_\_ capital.
  - (c) The gross working capital is a \_\_\_\_\_ concern concept.
  - (d) The rate of return on investments \_\_\_\_\_ with the shortage of working capital.
  - (e) The greater the size of a business unit \_\_\_\_\_ will be the requirements of working capital.
2. *State whether the following statements are true or false:*
  - (a) Gross working capital refers to the capital invested in the total assets of an enterprise.
  - (b) Net working capital is the excess of current liabilities over current assets.
  - (c) Every business concern should have excessive working capital.
  - (d) The larger the process period of manufacture, the larger is the amount of working capital required.
  - (e) The fixed proportion of working capital should be generally financed from the fixed capital sources.
  - (f) Commercial banks provide loans for working capital.

## Review Questions

1. What is working capital?
2. Name the components of current assets.
3. Name the components of current liabilities.
4. Name the concepts of working capital?
5. What is gross working capital?
6. What is net working capital?
7. “Working capital is a means and not an end.” Discuss all such factors which exercise influence on the demand for working capital in a business concern.
8. What is meant by working capital? Discuss the factors which determine working capital needs of a firm.
9. Define working capital. Discuss the various concepts of working capital.
10. What will be the effect of having shortage of working capital or excessive working capital in a firm?
11. Write briefly about the important components of working capital.
12. Differentiate between gross and net working capital.
13. Why is it important to study working capital management as a separate area in financial management?
14. Why should the level of working capital in a firm be optimal?
15. Explain the meaning of working capital giving reference to net working capital and gross working capital.
16. What is the importance of working capital management? Why should the level of working capital in a firm be optimal?
17. Why is working capital management important for firms?
18. Discuss the dangers of inadequate working capital.

## Exercises

1. Prepare an estimate of working capital requirement from the following information of a trading concern:
  - Projected sales 2,00,000 units
  - Selling price—₹ 10 per unit
  - Percentage net profit on sales—35%
  - Average credit period allowed to customers—8 weeks
  - Average credit period allowed to suppliers—4 weeks
  - Average stock holding in terms of sales requirement—12 weeks
  - Allow 12% for contingencies.
2. The Board of directors of Shiva engineering Ltd. requests you to advise them the average amount of working capital required in the first year's of working. You are given the following estimates and are instructed to add 10% to your computed figure to allow for contingencies:

(a) Amount blocked up in stocks:	Figures for the years (₹)
Stock of finished goods	7000
Stock of stores, materials	10,000
(b) Average credit sales:	
Inland sales—6 weeks credit	2,00,000
Export sales—1½ months	70,000
(c) Lag in payment of wages and other outgoings:	
Wages—2 weeks	2,60,000
Stock of materials—1½ months	43,000
Rent, royalties—6 months	10,000
Clerical staff—½ month	65,000
Manager—½ month	4600
Miscellaneous expenses—1½ months	42,000
(d) Payment in advances:	
Sundry expenses (paid quarterly in advance)	6000
(e) Undrawn profit on the average throughout the year	13,000

3. A proforma cost sheet of a company provides the following particulars:

Elements of cost	Amount per unit
Materials	50%
Direct labour	15%
Overheads	15%

The following further particulars are available:

- (a) It is proposed to maintain a level of activity of 3,00,000 units.
- (b) Selling price is ₹ 20 per unit.
- (c) Raw materials are expected to remain in stores for an average of 2 months.
- (d) Materials will be in process, an average of one month.
- (e) Finished goods are required to be in stock for an average of 2 months.
- (f) Credit allowed to debtors is two months.
- (g) Credit allowed by suppliers is two months.

You may assume that sales and production follow a consistent pattern. You are required to prepare a statement of working capital requirements.

4. A proforma cost sheet of a company provides the following particulars:

Elements of cost	Amount per unit
Materials	40%
Direct labour	20%
Overheads	20%

The following further particulars are available:

- (a) It is proposed to maintain a level of activity of 3,00,000 units.
- (b) Raw materials are expected to remain in stores for an average period of one month.
- (c) Materials will be in process, an average of half a month.
- (d) Selling price is ₹ 15 per unit.
- (e) Finished goods are required to be in stock for an average period of one month.
- (f) Credit allowed to debtors is two months.
- (g) Credit allowed by suppliers is one month.

You may assume that sales and production follow a consistent pattern. You are required to prepare a statement of working capital requirements.

5. From the information given below, estimate capital requirement of Raju trading Co.:
- (a) Debtors velocity—3 months
  - (b) Stock velocity—8 months
  - (c) Creditors velocity—3 months
  - (d) Gross profit/sales ratio—25%
  - (e) Minimum cash balance to be maintained—5% on sales
  - (f) Gross profit for the year—₹ 8,00,000

You are required to prepare a statement of working capital requirements.

# 14

## Chapter

# Cash Management

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of cash and motives for holding cash
- Cash forecasting and budgeting
- Objectives of cash management and factors affecting the cash needs
- Investment of surplus cash
- Meaning of cash budget
- How to prepare cash budget

### MEANING OF CASH

It is important to understand that the net cash flow is not the same as profit earned in a period. It is an alarming reality that many business managers have a negligible appreciation of this fundamental aspect of accounting. Hence, most of the business failures can be attributed to the manager's failure to recognize a looming liquidity crisis. It is important to have a proper cash management system in place.

Cash is the most liquid asset of all and is essential for the survival of any business organization. Its efficient management is vital for the solvency of the business as cash is the focal point of the funds flows in a business. It can be understood in two senses—one is the actual cash held by the firm and deposits which can be withdrawn on demand, and in another sense it includes marketable securities, which can be converted into cash immediately. The aim of cash management is to reduce the amount of cash that is being used within the firm so as to increase profitability, but without reducing business activities or exposing the firm to undue risk in its financial obligations. Cash flows in connection with credit serve to introduce the concept of FLOAT, which is the time

lag or delay between the moment of disbursement of funds on the part of the customer and the moment of receipt of funds on the part of the seller (i.e., mail time, processing time, and clearing time with the banking system).

Cash in hand must be held so that bills are paid on time (transactions balance), for emergencies such as strikes, weather disruptions, etc. (precautionary balance), bank requirements for loans or other services provided (compensating balance), and for taking advantage of bargains (speculative balance).

## **MOTIVES FOR HOLDING CASH**

The following are the motives for holding cash.

### **Transaction Motive**

Creating products and providing services is the mainstay of every business organization. Providing of services and creating of products results in the need for cash inflows and outflows. Firms hold cash in order to satisfy the cash inflow and cash outflow needs that they have.

### **Precautionary Motive**

Business is subjected to risk and uncertainty of various natures. Holding cash as a precaution serves as an emergency fund for a firm. If expected cash inflows are not received as anticipated, cash held on a precautionary basis could be used to satisfy short-term obligations.

### **Compensating Motive**

Business organizations do most of its financial transactions through banks. Banks provide a variety of services to business firms, such as clearance of cheque, supply of credit, etc., for which a minimum balance is required to be kept with the bank. This balance is to compensate banks for services rendered.

### **Speculative Motive**

The success of any business depends on the ability of the businessman's responsiveness to opportunities. Economist Keynes described the reason for holding cash as creating the ability for a firm to take advantage of special opportunities that, if acted upon quickly, will favour the firm. An example of this would be purchasing extra inventory at a discount that is greater than the carrying costs of holding the inventory.

## **CASH FORECASTING AND BUDGETING**

Cash budget is the most significant tool to plan for and control cash receipts and payments. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period. Cash forecasts are needed to prepare cash budgets. Cash forecasting may be done on short or long term basis.

**1. Short-term forecasting methods (covering periods of one year)**

There are two types of short-term forecasting method.

- (a) Receipts and disbursement method (a week or a month)
- (b) Adjusted net income method

**Receipts and disbursement method**

Cash flows can be compared with the budgeted income and expense items in this method. The sources of cash flows can be identified:

- (a) **Operating cash flows:** Cash sales and collections from customers
- (b) **Non-operating cash flows:** Sale of old assets and dividend and interest income
- (c) **Financial cash flows:** When internally generated cash flows are not sufficient, the firm resorts to external sources such as borrowing and issuance of securities.

**Adjusted net income method**

It involves tracing of working capital flows and is also called sources and uses approach.

The objectives of this approach can be:

- (a) To project the company's need for cash at a future date
- (b) To show whether the company can generate the required funds internally and if not, how much it will have to borrow or raise funds in the capital market.

**2. Long-term cash forecasting**

It gives an idea of the company's cash requirements in the distant future.

**Uses:**

- (a) Indicates the company's future cash needs.
- (b) Helps to evaluate the proposed capital projects.
- (c) Helps to improve corporate planning.

**OBJECTIVES OF CASH MANAGEMENT**

The financial manager must know as to why the cash management is a necessity. The cash management strategies are generally built around two goals:

- To provide cash needed to meet the obligations
- To minimize the idle cash held by the firm.

The financial manager has to strike an acceptable balance between holding too much cash and too little cash. This is the focal point of the cash risk-return trade-off. A large cash investment minimizes the chances of default but penalizes the profitability of the firm. A small cash balance target may free the excess cash balance for investment in marketable securities and thereby enhance the profitability as well as value of the firm, but increases simultaneously the chances of running out of cash. The risk-return trade-off of any firm can be reduced to two prime objectives for the firm's cash management system as follows—meeting the cash outflows and minimizing the cash balance.

## Meeting the Cash Outflows

The primary objective of cash management is to ensure the cash outflows as and when required. Enough cash must be on hand to meet the disbursement needs that arise in the normal course of business. The firm should be able to make the payments at different point of time without any liquidity problem. It means that the firm should have sufficient cash to meet the payment schedules and disbursement needs. It will help the firm in (a) avoiding the chance of default in meeting financial obligations; otherwise the goodwill of the firm is adversely affected, (b) availing the opportunities of getting cash discounts by making early or prompt payments, and (c) meeting unexpected cash outflows without much problem.

## Minimizing the Cash Balance

Investment in idle cash balance must be reduced to the minimum. This objective of cash management is based on the idea that unused asset earns no income for the firm. The funds locked up in cash balance are a dead investment and have no earning. Therefore, whatever cash balance is maintained, the firm is foregoing interest income on that balance. The objective of cash management, therefore, should be to keep minimum cash balance. However, the objective of cash management i.e., maintaining the minimum cash balance must be looked into together with the other objectives i.e., maintaining the payment schedule etc., which require that a firm must have sufficient liquidity (even at the cost of reducing profitability). But the objective of minimum cash balance affects the liquidity thereby increasing profitability. Thus, these objectives seem to be contradictory in nature and hence the financial manager has to achieve a trade-off between them. He has to ensure that the minimum cash balance being maintained by the firm does not affect the payment schedule and meet all disbursement needs. Cash management strategies are needed to reconcile these two goals, wherever possible. However, meeting payment commitments takes higher priority than minimizing the cash balance.

## FACTORS AFFECTING CASH NEED

It has already been said that the financial manager has to achieve a trade-off between liquidity and profitability and in doing so, he should note that there are various factors, which will determine the amount of cash balance to be kept by the firm. Some of these factors are discussed below.

### Cash Cycle

The cash cycle may be described as the time that elapses from the point when the firm makes an outlay to purchase raw materials to the point when cash is collected from the sale of finished goods produced using that raw material. Different patterns of cash cycles and cash flows may be there depending upon the nature of the business.

## Cash Inflows and Cash Outflows

Every firm has to maintain cash balance because its expected inflows and outflows are not always corresponding. The timings of the cash inflows may not always match with the timing of the outflows. Therefore, a cash balance is required to fill up the gap arising out of difference in timings and quantum of inflows and outflows. If the inflows are appearing just at the time when cash is



required for payment, then no cash balance will be required to be maintained by the firm. But this seldom happens. So, the financial manager has to identify the timings and quantity by which the inflows will not be matched with the outflows and an arrangement must be made to fill the gap.

### **Cost of Cash Balance**

There is always an opportunity cost of maintaining excessive cash balance. If a firm is maintaining excess cash, then it is missing the opportunities of investing these funds in a profitable way. Similarly, if the firm is maintaining inadequate cash balance, then it may be required to arrange funds on an emergency basis to meet any unexpected shortage. Even if the shortage is expected to continue only for a short period, the funds are to be arranged and there will always be a cost (may be more than normal cost) of raising fund.

### **Other Considerations**

In addition to the preceding factors, there may be some other considerations also affecting the need for cash balance. There may be several subjective considerations such as uncertainties of a particular trade, staff required for cash management etc., which will have a bearing on determining the cash balance required by a firm.

## **INVESTMENT OF SURPLUS CASH**

Excess cash typically refers to a surplus of cash resulting from company operations or the proceeds of the sale of a major asset—in other words, cash that is the product of normal business activity that is being held until it is used to pay off debt or reinvested in a long-term investment. In addition, there are circumstances in which companies find it advisable to maintain a certain amount of excess cash to meet unusual needs, even if they borrow funds regularly through lines of credit at banks or commercial paper or other forms of debt.

A cash cushion is often advisable because a company may not always have access to capital when it needs it. For example, if the company has an opportunity to purchase a large quantity of raw material, a capital asset, or other business opportunity with short notice, it may be difficult to arrange for the additional credit. There are also situations in which revenue falls suddenly as a result of a breakdown in the delivery of the company's product, for example, or problems with a billing system, or a labour dispute. And if the company's earnings are down or its industry is in disfavour, the treasury manager may not be able to renew or expand credit lines or go into the commercial paper or corporate debt market. Finally, the company that has gone to the top of its borrowing lines or is negotiating to expand them will need a cushion of cash to meet liquidity requirements until the credit is secured.

The appropriate objective in investing excess cash is to achieve a competitive rate of return with minimum risk and to have the money available when it is needed. The company should define its investment objectives, and the approach it will take to achieve them, in a written investment policy and set of guidelines.

The major concern in investing excess cash is the maturity of the investments. The maturity date of any investment should be determined by the date on which the cash will be needed. In deciding on the appropriate maturities, the investor must bear in mind that the longer the maturity,

the greater the exposure to a loss of principal should the instrument have to be sold at a time interest rates are higher than they were when the instrument was purchased. Obviously, the longer the maturity and the higher the move in interest rates, the greater the loss. The company's need for liquidity determines the choice of both the maturity and the instrument; yield is a lesser concern. So, the investor needs to know what instruments are available at what yield and with what liquidity.

### Criteria for Investment of Surplus Cash

In most of the companies, there are usually no formal written instructions for investing the surplus cash. It is left to the discretion and judgement of the finance manager. While exercising such judgment, he usually takes into consideration the following factors:

**Security:** This can be ensured by investing money in securities whose price remains more or less stable.

**Liquidity:** This can be ensured by investing money in short-term securities, including short-term fixed deposits with banks.

**Yield:** Most corporate managers give less emphasis to yield as compared to security and liquidity of investment. So, they prefer short-term government securities for investing surplus cash.

**Maturity:** It will be advisable to select securities according to their maturities so the finance manager can maximize the yield as well as maintain the liquidity of investments.

## CASH BUDGET

A cash budget is a summary of movement of cash during a particular period.

There are three methods of preparation of cash budget. These are:

- (i) Adjusted Net Income
- (ii) Pro-forma Balance Sheet
- (iii) Cash Receipts and Disbursements.

### The Adjusted Net Income Method

It requires that a pro-forma income statement should be prepared for each desired interim period of the budget period. The net income figures for each period are then adjusted to a cash basis by deleting the transactions that are affecting the income statements, but not the cash balance or the items, which affect the one without affecting the other. This adjusted figure is taken as cash profit (loss) during that period. This can be taken as net increase or decrease in cash balance during that period.

### The Pro-forma Balance Sheet Method

It requires the preparation of as many pro-forma balance sheets as there are interim periods in the cash budget. Each item of the balance sheet except cash is projected for each period, and the cash balance is ascertained in accordance with the accounting equation i.e., Total Assets = Total

Liabilities + Capital. The balancing figure of the pro-forma balance sheet is taken as the cash balance. A negative cash balance or a cash balance falling below minimum desirable balance would, of course, indicate a need for borrowing funds or otherwise adjusting the flow to make up the anticipated shortages of cash.

### **Receipts and Payments Method of Cash Budget**

Cash budget, under this method, is a statement projecting the cash inflows and outflows (receipts and disbursements) of the firm over various interim periods of the budget period. For each period, the expected inflows are put against the expected outflows to find out if there is going to be any surplus or deficiency in a particular period. Surplus, if any, during a particular period may be carried forward to the next period or steps may be taken to make short-term investments of this surplus. Deficiencies, if any, must be arranged for within the same period from some short-term sources of finance such as bank credit, etc. The cash budget, under the receipts and payments method, may be prepared on a monthly basis or quarterly or half-yearly basis. For every month/quarter/half-year, there is an opening cash balance, expected inflows and expected outflows during that period and a closing balance of cash at the end of that period.

### **Preparation of Cash Budget**

Cash receipts included in the cash budget are on the following pattern:

- Cash sales
- Collection from debtors
- Interest received on investments and dividends
- Sale of marketable securities
- Issue of new securities for cash
- Raising of loans (borrowings)
- Proceeds from sale of assets
- Miscellaneous receipts

The items of cash expenditure are presented as follows:

- Cash purchases
- Payments to sundry creditors and bills payable
- Payments for wages and salary, rent and other expenses
- Payments in the nature of capital expenditure
- Payment of market securities
- Loan repayments
- Tax payments
- Redemption of securities
- Interest payments on banks loan and other borrowings
- Dividend payments
- Miscellaneous payments

Figure 14.1 shows a format of cash budget.

### Cash budget 20...

Particulars	Jan.	Feb.	Mar.	April
<b>Opening Balance (A)</b>				
Add: Receipts				
<b>Total Receipts (B)</b>				
Less: Payments				
<b>Total payments (C)</b>				
Surplus/Deficit (B – C)				
<b>Closing Balance (A + B – C)</b>				

**Figure 14.1** *Format of Cash Budget*

## ILLUSTRATIONS

1. Make out a cash budget for April—June 2004 from the following information:

(i) Actual and Budgeted Sales:

	Actual (₹)		Budgeted (₹)
January	10,000	April	90,000
February	80,000	May	85,000
March	75,000	June	80,000

(ii) Actual and Budgeted Purchases:

	Actual (₹)		Budgeted (₹)
January	45,000	April	50,000
February	40,000	May	45,000
March	42,000	June	35,000

(iii) Actual and Budgeted Wages and Expenses:

	Actual (₹)			Budgeted (₹)	
	Wages	Expenses		Wages	Expenses
January	20,000	5000	April	24,000	7000
February	18,000	6000	May	20,000	6000
March	22,000	6000	June	18,000	5000

(iv) Special:

Advance income-tax in May—₹ 4000

Plant in April—₹ 10,000

(v) Rent ₹ 300 payable each month not included in expenses.

(vi) 10% of purchases and sales are on cash terms.

(vii) Credit purchases are paid after one month and credit sales are collected after two months. Time lag in wages and expenses—½ month

(viii) Cash and Bank balances on 1st April—₹ 13,000

**Solution:****Cash Budget**

<i>Particulars</i>	<i>April</i>	<i>May</i>	<i>June</i>
<b>Opening Balance</b>	<b>13,000</b>	<b>11,400</b>	<b>5100</b>
<i>Add: Cash Receipts:</i>			
Cash Sales	9000	8500	8000
Receipts from Debtors	72,000	67,500	81,000
<b>Total Receipts (A)</b>	<b>94,000</b>	<b>87,400</b>	<b>94,100</b>
<i>Less: Cash Payments:</i>			
Payment of Creditors	37,800	45,000	40,500
Cash Purchases	5000	4500	3500
Wages	23,000	22,000	19,000
Expenses	6500	6500	5500
Rent	300	300	300
Advance Income-Tax	—	4000	—
Plant	10,000	—	—
<b>Total Payments (B)</b>	<b>82,600</b>	<b>82,300</b>	<b>68,800</b>
<b>Closing Cash Balance (A – B) = C</b>	<b>11,400</b>	<b>5100</b>	<b>25,300</b>

2. From the following information, prepare a cash budget for the three months commencing 1st June when the bank balance was ₹ 1,10,000:

<b>Month</b>	<b>Sales (₹)</b>	<b>Selling overheads (₹)</b>	<b>Purchases (₹)</b>	<b>Wages (₹)</b>
April	88,500	3250	37,000	8000
May	84,000	4100	40,000	8400
June	93,000	3710	39,060	8800
July	72,000	3210	39,900	6000
August	82,500	3600	35,000	9600

Factory Overheads	Administration Overheads	Research Expenditure
5680	2500	2400
5920	2760	2400
5440	2480	2400
5880	2600	2400
6000	2520	2600

A sales commission of 5% on sales is due 2 months after sales, is payable in addition to the above selling overheads.

### Capital Expenditure:

Plant Purchased, June—₹ 38,000—payable on delivery

Building purchase—June for ₹ 80,000 payable in two half yearly instalments, first in July

A dividend of ₹ 20,000 will be paid in October.

Period of credit allowed by suppliers and to customers is 8 weeks. For other payments, the following points are to be noted:

Wages	1/8 <sup>th</sup> months
Factory Overheads	4 weeks
Administration Overheads	4 weeks
Research Expenditure	4 weeks
Selling Overheads	4 weeks

### Solution:

### Cash Budget

Particulars	June	July	August
<b>Opening Balance</b>	<b>1,10,000</b>	<b>95,145</b>	<b>74,565</b>
<i>Add:</i> Cash Receipts:			
Receipts from Debtors	88,500	84,000	93,000
<b>Total Receipts (A)</b>	<b>1,98,500</b>	<b>1,79,145</b>	<b>1,67,565</b>
<i>Less:</i> Cash Payments:			
Payment of Creditors	37,000	40,000	39,060
Selling Overheads	4100	37,100	3210
Wages	8750	6350	9150
Factory Overheads	5920	5440	5880
Administration O.H.	2760	2480	2600
Research Expenses	2400	2400	2400
Plant Purchases	38,000	—	—
Building	—	40,000	—
Sales Commission	4425	4200	4650
<b>Total Payments (B)</b>	<b>1,03,355</b>	<b>1,04,580</b>	<b>66,950</b>
<b>Closing Cash Balance (A – B) = C</b>	<b>95,145</b>	<b>74,565</b>	<b>1,00,615</b>

3. From the following budgeted figures, prepare a cash budget in respect of three months up to June 30:

Month	Sales (₹)	Materials (₹)	Wages (₹)	Overheads (₹)
January	60,000	40,000	11,000	6200
February	56,000	48,000	11,600	6600
March	64,000	50,000	12,000	6800
April	80,000	56,000	12,400	7200
May	84,000	62,000	13,000	8600
June	76,000	50,000	14,000	8000

Expected cash balance on 1st April—₹ 20,000

Other information:

- (i) Materials and overheads are to be paid during the month following the month of supply.
- (ii) Wages are to be paid during the month in which they are incurred.
- (iii) Terms of Sales—The terms of credit sales are payment by the end of the month following the month of sales; half of the sales are paid when due, the other half to be paid during the next month.
- (iv) 5% sales commission is to be paid within the month following actual sales.
- (v) Preference dividend for ₹ 30,000 is to be paid on 1st May.
- (vi) Share call money for ₹ 25,000 is due on 1st April and 1st June.
- (vii) Plant and machinery worth ₹ 10,000 is to be installed in the month of January and the payment is to be made in the month of June.

**Solution:**

### Cash Budget

<i>Particulars</i>	<i>April</i>	<i>May</i>	<i>June</i>
<b>Opening Balance</b>	<b>20,000</b>	<b>32,600</b>	<b>–5600</b>
<i>Add:</i> Cash Receipts:			
Receipts from Debtors	60,000	72,000	82,000
Share Call	25,000	–	25,000
<b>Total Receipts (A)</b>	<b>1,05,000</b>	<b>1,04,600</b>	<b>1,01,400</b>
<i>Less:</i> Cash Payments:			
Materials	50,000	56,000	62,000
Wages	12,400	13,000	14,000
Overheads	6800	7200	8600
Sales commission	3200	4000	4200
Preference Dividend	–	30,000	–
Plant and Machinery	–	–	10,000
<b>Total Payments (B)</b>	<b>72,400</b>	<b>1,10,200</b>	<b>98,800</b>
<b>Closing Cash Balance (A – B) = C</b>	<b>32,600</b>	<b>–5600</b>	<b>2600</b>

**Working Notes:****Receipts from Debtors:**

	<b>Jan.</b>	<b>Feb.</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
Jan.	—	30,000	30,000	—	—	—
Feb.	—	—	28,000	28,000	—	—
March	—	—	—	32,000	32,000	—
April	—	—	—	—	40,000	40,000
May	—	—	—	—	—	42,000
June	—	—	—	—	—	—
<b>Total Receipts</b>	<b>—</b>	<b>30,000</b>	<b>58,000</b>	<b>60,000</b>	<b>72,000</b>	<b>82,000</b>

4. Prepare a Cash Budget for the month of May, June and July of The Capitol on the basis of the following information:

(₹ in '000)						
<b>Month</b>	<b>Credit Sale</b>	<b>Credit Purchase</b>	<b>Wages</b>	<b>Manufacturing</b>	<b>Office Exp.</b>	<b>Selling Exp.</b>
March	6000	3600	900	400	200	400
April	6200	3800	800	300	150	500
May	6400	3300	1000	450	250	450
June	5800	3500	850	350	200	350
July	5600	3900	950	400	100	450
August	6000	3400	800	300	150	450

The following additional information is available:

- (i) Cash balance on 1st May is ₹ 8,00,000.
- (ii) Dish-washing machine cost ₹ 16,00,000 is due for delivery in July, payable 10% on delivery and balance after three months.
- (iii) Advance taxes of ₹ 8,00,000, each is payable in March and June.
- (iv) Period of credit allowed:
  - (a) By suppliers two months
  - (b) To customers one month
  - (c) Lag in payment of manufacturing expenses  $\frac{1}{2}$  month
  - (d) Lag in payment of office and selling expenses one month



**Solution:****Cash Budget**

<i>Particulars</i>	<i>May</i>	<i>June</i>	<i>July</i>
<b>Opening Balance</b>	<b>8,00,000</b>	<b>8,00,525</b>	<b>1175</b>
<i>Add:</i> Cash Receipts: Receipts from Debtors	6200	6400	5800
Total Receipts (A)	8,06,200	8,06,925	6975
<i>Less:</i> Cash Payments: Payment to Creditors Wages Manufacturing expenses Office Expenses Selling Expenses Dish-Washer Advance Tax	3600 1000 375 150 500 — —	3800 850 400 250 450 — 8,00,000	3300 950 375 200 350 1,60,000 —
Total Payments (B)	5675	8,05,750	1,65,175
<b>Closing Cash Balance (A – B) = C</b>	<b>8,00,525</b>	<b>1175</b>	<b>–1,58,200</b>

5. The information given below is taken from the records of the Hotel Gold Rims:

(₹ in '000)

	<b>Estimated Receipts</b>				
	<b>Jan.</b>	<b>Feb.</b>	<b>March</b>	<b>April</b>	<b>Total</b>
Room Sales	2500	5000	6500	8000	22,000
Food Sales	2000	3500	5000	6000	16,500
Liquor Sales	300	600	1000	1200	3100
Other Sales	100	200	250	300	850
<b>Total</b>	<b>4900</b>	<b>9300</b>	<b>12,750</b>	<b>15,500</b>	<b>42,450</b>

	<b>Estimated Expenditure</b>				
	<b>Jan.</b>	<b>Feb.</b>	<b>March</b>	<b>April</b>	<b>Total</b>
Food Purchase	0700	1200	2000	2400	06,300
Liquor Purchases	0100	0200	0500	0600	01,400
Labour Costs	2000	4000	5000	6500	18,500
Overheads	0850	1500	2000	2200	06,550
<b>Total</b>	<b>3650</b>	<b>6900</b>	<b>10,500</b>	<b>11,700</b>	<b>32,750</b>

## Additional Information:

- (i) Opening bank balance on 1st February is ₹ 50,00,000.
- (ii) All receipts are assumed to be in cash.
- (iii) Payments for food and liquor purchases and overheads are due in the month following.
- (iv) Labour costs are paid in the same month to which they refer.
- (v) An amount of ₹ 4,00,000 is estimated in April as interest due on investment.
- (vi) ₹ 4,50,000 of taxation is due to be paid in April.
- (vii) A capital expenditure for equipment is planned for January, for which payment will be due in February ₹ 10,00,000 and March ₹ 10,00,000.

You are required to prepare a cash budget.

**Solution:**

**Hotel Gold Rims Ltd.**  
**Cash Budget**

(Fig. in '000s)

<i>Particulars</i>	<i>Feb.</i>	<i>March</i>	<i>April</i>
<b>Opening Balance</b>	<b>5000</b>	<b>7650</b>	<b>11,500</b>
<i>Add:</i> Cash Receipts:			
Rooms	5000	6500	8000
Food	3500	5000	6000
Liquor	600	1000	1200
Others	200	250	300
Interest on Investment	—	—	400
<b>Total Receipts (A)</b>	<b>14,300</b>	<b>20,400</b>	<b>27,400</b>
<i>Less:</i> Cash Payments:			
Food Purchases	700	1200	2000
Liquor Purchases	100	200	500
Labour	4000	5000	6500
Overheads	850	1500	2000
Taxes			450
Equipment	1000	1000	
<b>Total Payments (B)</b>	<b>6650</b>	<b>8900</b>	<b>11,450</b>
<b>Closing Cash Balance (A – B) = C</b>	<b>7650</b>	<b>11,500</b>	<b>15,950</b>

6. The Mahergoan Restaurant Ltd. was opened restaurant on 1st April with ₹ 1,65,000 cash. Of the capital cost already incurred, ₹ 2,75,000 is due for payment on 25th June. An extract of figures expected in the next six months is given below:

	Sales	Purchases	Wages	Rent	Depreciation	Other Exp.
	₹	₹	₹	₹	₹	₹
April	1,10,000	55,000	38,500	16,500	13,750	49,500
May	1,10,000	44,000	38,500	16,500	13,750	22,000
June	1,65,000	68,750	49,500	16,500	13,750	24,750
July	2,22,000	88,000	66,000	16,500	13,750	27,500
August	2,47,500	96,250	66,000	16,500	13,750	30,250
September	2,75,000	1,10,000	82,500	16,500	13,750	33,000

- (a) Rent is paid quarterly in advance.  
 (b) Each month it is anticipated that ₹ 11,000 of purchases is for cash, the balance, bought on credit, is payable one month in arrears, i.e., the following month.  
 (c) The 'other expenses' will be paid two months in arrears.  
 (d) One-tenth of the sales are expected to be credit sales collected two months after they have been made.

From the above information, prepare a cash budget for the period April to September.

**Solution:**

**Mahergoan Restaurant Ltd. Cash Budget For Months April to Sept.**

<i>Particulars</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug.</i>	<i>Sept.</i>
<b>Opening Balance</b>	<b>1,65,000</b>	<b>2,03,500</b>	<b>2,47,500</b>	<b>2,75,000</b>	<b>3,07,050</b>	<b>3,84,050</b>
<i>Add: Cash Receipts:</i>						
Cash Sales	99,000	99,000	1,48,500	1,99,800	2,22,750	2,47,500
Cash received from Debtors	—	—	11,000	11,000	16,500	22,200
<b>Total Receipts (A)</b>	<b>2,64,000</b>	<b>3,02,500</b>	<b>4,07,000</b>	<b>4,85,800</b>	<b>5,46,300</b>	<b>6,53,750</b>
<i>Less: Cash payments:</i>						
Cash Purchases	11,000	11,000	11,000	11,000	11,000	11,000
Payments to Creditors	—	44,000	33,000	57,750	77,000	85,250
Rent	49,500	—	—	49,500	—	—
Wages	—	—	38,500	38,500	49,500	66,000
Other Expenses	—	—	49,500	22,000	24,750	27,500
<b>Total Payments (B)</b>	<b>60,500</b>	<b>55,000</b>	<b>1,32,000</b>	<b>1,78,750</b>	<b>1,62,250</b>	<b>1,89,750</b>
<b>Closing Cash Balance (A – B) = C</b>	<b>2,03,500</b>	<b>2,47,500</b>	<b>2,75,000</b>	<b>3,07,050</b>	<b>3,84,050</b>	<b>4,64,000</b>

\* Depreciation is a non-cash expense. Hence, it will not be shown in the cash budget.

### Objective Type Questions

State whether the following statements are true or false:

- There is a time gap between cash inflows and cash outflows.
- Lock box system is a method for accelerating cash outflows.
- Bank float refers to the time taken by bank in collecting cheques.
- Cash management is a trade-off between the cost of carrying cash and the need of maintaining liquidity.
- A firm should always keep a large balance of cash so as to meet the contingencies.

### Review Questions

- What is the meaning of cash?
- What are the motives for holding cash?
- Write a note on cash forecasting.
- What are the objectives for holding cash?
- What are the factors affecting cash needs?
- What is a cash budget?
- Write a note on the methods of preparing cash budget.
- Distinguish between cash control and credit control.
- Explain the problems of cash management.

### Exercises

- From the following information, prepare a cash budget from 1.9.2007 to 31.12.2007:

Months	Purchases	Sales	Wages	Selling Expenses
	₹	₹	₹	₹
July	85,000	1,60,000	32,000	8000
August	92,000	1,85,000	37,000	9500
September	1,00,000	2,10,000	92,000	10,500
October	1,20,000	2,95,000	49,000	12,500
November	90,000	1,78,000	35,500	8900
December	98,000	1,82,000	36,000	9000

- Cash balance on 1.9.2007 is ₹ 10,500.
- Period of credit allowed to customers is 2 months.
- Period of credit allowed by suppliers is 1 month.
- Wages and Selling expenses are delayed in payment by 1 month.

2. From the following information, prepare a cash budget for 3 months from May to July.

<i>Months</i>	<i>Sales</i>	<i>Purchases</i>	<i>Wages</i>
March	40,000	20,000	6000
April	50,000	30,000	4000
May	60,000	25,000	7000
June	70,000	28,000	3000
July	60,000	30,000	5000

Additional information:

- Cash balance ₹ 6000.
  - Period of credit allowed by suppliers is 2 months.
  - Period of credit allowed to customers is 1 month.
  - Delay in payment of wages is one month.
3. Prepare a budget from the following data for the period July to October:

<i>Months</i>	<i>Sales</i>	<i>Purchases</i>	<i>Selling exp.</i>	<i>Wages</i>
June	2,50,000	80,000	10,000	11,000
July	2,35,000	75,000	12,000	12,000
August	2,11,000	95,000	15,000	13,000
September	2,08,000	65,000	12,500	14,000
October	2,10,000	83,000	13,000	15,000

Additional information:

- Opening balance in July is ₹ 80,000.
  - Period of credit allowed by suppliers is 1 month.
  - Period of credit allowed to customers is 1 month.
  - Delay in payment of wages is  $\frac{1}{2}$  month.
  - Dividends received in the month of October ₹ 20,000.
  - Selling expenses are met in the same month.
4. Prepare the cash budget for the months of April to June 2008 from the following information:

<i>Months</i>	<i>Credit sales</i>	<i>Credit purchase</i>	<i>Wages</i>	<i>Selling expenses</i>	<i>Overheads</i>
Jan.	1,60,000	85,000	32,000	7000	10,000
Feb.	1,85,000	92,000	37,000	10,000	11,000
March	2,10,000	1,00,000	42,000	8500	13,000

*Contd.*

April	2,45,000	1,20,000	49,000	4500	14,500
May	1,78,000	90,000	30,000	7200	10,500
June	1,82,000	98,000	36,000	6000	11,000

Additional information:

- (i) Period of credit allowed to debtor is 1 month.
  - (ii) Period of credit allowed by creditor is 2 months.
  - (iii) Lag in payment of wages, selling expenses, and overhead is 1 month
  - (iv) Cash balance for the month of April is ₹ 15,000.
5. From the following forecasts of income and expenditure, prepare a cash budget for the months January to April 2010:

<i>Months</i>	<i>Sales (credit)</i>	<i>Purchases (credit)</i>	<i>Wages</i>	<i>Manufacturing expenses</i>	<i>Admn expenses</i>	<i>Selling expenses</i>
Nov.	30,000	15,000	3000	1150	1060	500
Dec.	35,000	20,000	3200	1225	1040	550
Jan.	25,000	15,000	2500	990	1100	600
Feb.	30,000	20,000	3000	1050	1150	620
March	35,000	22,500	2400	1100	1220	570
April	40,000	25,000	2600	1200	1180	710

Additional information:

- (i) Customers are allowed a credit period of 2 months.
  - (ii) A dividend of ₹ 10,000 is payable in April.
  - (iii) Plant purchase on 15th of January for ₹ 5000.
  - (iv) Building has been purchased on 1st march and the payments are to be made in monthly instalments of ₹ 2000 each.
  - (v) The creditors are allowed a credit of 2 months.
  - (vi) Wages are paid on the 1st of the next month.
  - (vii) Lag in payment of other expenses is one month.
  - (viii) Balance of cash in hand on 1st January 2010 is ₹ 15,000.
6. From the following budget data, forecast the cash position at the end of April, May and June 2010:

<i>Months</i>	<i>Sales</i>	<i>Purchases</i>	<i>Wages</i>	<i>Miscellaneous</i>
February	1,20,000	84,000	10,000	7000
March	1,30,000	1,00,000	12,000	8000

Contd.

April	80,000	1,04,000	8000	6000
May	1,16,000	1,06,000	10,000	12,000
June	88,000	80,000	8000	6000

**Additional Information:**

- (i) Sales: There is two months credit period allowed to the customer.
  - (ii) Purchases: These are paid in the month following the month of supply.  
Wages: Delay in payment of one month.
  - (iii) Miscellaneous expenses: Paid a month in arrears.
  - (iv) Rent: ₹ 1000 per month paid quarterly in advance due in April.
  - (v) Income Tax: First installment of advance tax ₹ 25,000 due on or before 15th June.
  - (vi) Income from investments: ₹ 5000 revived quarterly in April, July, etc.
  - (vii) Cash in hand: ₹ 5000 on 1st April 2010.
7. Anand Hotels Ltd. gives the following information and requests you to prepare a cash budget for 3 months from April to June 2010:

<i>Months</i>	<i>Sales</i>	<i>Purchases</i>	<i>Wages</i>	<i>Expenses</i>
Feb.	3,50,000	2,50,000	29,000	12,000
March	4,00,000	3,00,000	30,000	16,000
April	2,50,000	3,40,000	36,000	18,000
May	2,40,000	3,20,000	32,000	20,000
June	2,60,000	3,00,000	30,000	20,000

**Additional Information:**

- (i) Cash balance expected on 1st April 2010 ₹ 2,20,000
  - (ii) There is one month credit period allowed to the customer.
  - (iii) Creditors are paid in the month following the month of supply.
  - (iv) Lag in payment wages is ½ month.
  - (v) Advance tax of ₹ 25,000 is payable in June.
  - (vi) Interest receivable on investment in April is ₹ 10,000.
  - (vii) Dividends at 20% is payable on the paid-up capital of ₹ 2,00,000 in May.
  - (viii) Bonus payable to workers in April is ₹ 20,000.
8. Prepare a cash budget for the months of May, June, and July 2009 on the basis of the following information:

<i>Months</i>	<i>Credit sale</i>	<i>Credit purchase</i>	<i>Wages</i>	<i>Manufacturing expenses</i>	<i>Office expenses</i>	<i>Selling expenses</i>
March	60,000	36,000	9000	4000	2000	4000
April	62,000	38,000	8000	3000	1500	5000

*Contd.*

May	64,000	33,000	10,000	4500	2500	4500
June	58,000	35,000	8500	3500	2000	3500
July	56,000	39,000	9500	4000	1000	4500
August	60,000	34,000	8000	3000	1500	4500

Additional Information:

- (i) Cash balance on 1st May 2009 ₹ 8000.
  - (ii) Plant costing ₹ 16,000 is due delivery in July, payable 10% on delivery and the balance after 3 months.
  - (iii) Advance tax of ₹ 8000 each is payable in March and June.
  - (iv) Period of credit allowed by suppliers is 2 months, and to customers 1 month.
  - (v) Lag in payment of manufacturing expenses is 1/2 month.
  - (vi) Lag in payment of office and selling expenses is 1 month.
9. From the following data, prepare a cash budget for the 3 months commencing 1st June 2010, when the bank balance was ₹ 1,00,000

<i>Month</i>	<i>Sales</i>	<i>Purchase</i>	<i>Wage</i>	<i>Production Expenses</i>	<i>Administration Expenses</i>
April	80,000	41,000	5600	3900	10,000
May	76,500	40,500	5400	4200	14,000
June	78,500	38,500	5400	5100	15,000
July	90,000	37,000	4800	5100	17,000
August	95,000	35,000	4700	6000	13,000

There is two months credit period allowed to customers and received from suppliers; wages, production expenses and administrative expenses are payable in the following month.



# 15

## Chapter

# Receivables Management

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of receivables management
- Cost of maintaining receivables
- Elements of receivables management

### INTRODUCTION

One of the closest to cash assets is accounts receivable as, in the normal course of business, an account receivable will become cash in short term. There are two costs associated with extending credit to customers:

1. The cost of not collecting cash at the time of sale and the vendor has a bank overdraft for which he has to pay interest.
2. The cost of loss of revenue due to some accounts receivable proving to be uncollectible.

Receivables are the amount of a business blocked in the form of debtors and bills. These are current assets of a business firm. The objective of receivables management is to promote sales and profits until that point is reached where the returns that the company gets from funding of receivable are less than the cost that the company has to incur in order to fund these receivables. Hence, the purpose of receivables is directly connected with the company's objectives of making credit sales, which are:

- Increasing total sales as, if a company sells goods on credit, it will be in a position to sell more goods than if it insists on immediate cash payment.

- Increasing profits as a result of increase in sales not only in volume, but also because companies charge a higher margin of profit on credit sales as compared to cash sales.
- In order to meet increasing competition, the company may have to grant credit sales.

## **COST OF MAINTAINING RECEIVABLES**

The cost of maintaining receivables involves the following.

### **Additional Fund Requirement for the Company**

When a firm maintains receivables, some of the firm's resources remain blocked in them because there is a time lag between the credit sale to the customer and receipt of cash from them as payment. To the extent the firm's resources are blocked in its receivables, it has to arrange additional finance to meet its own obligations towards its creditors and employees, like payments for purchases, salaries and other production and administrative expenses. Where this additional finance is met from its own resources or from outside, it involves a cost to the firm in terms of interest (if financed from outside) or opportunity costs (if internal resources which could have been put to some other use are taken).

### **Administrative Costs**

When a company maintains receivables, it has to incur additional administrative expenses in the form of salaries to clerks who maintain records of debtors, expenses on investigating the creditworthiness of debtors, etc.

### **Collection Costs**

These are the costs which the firm has to incur for collection of the amount at the appropriate time from the customers.

### **Defaulting Cost**

When customers make default in payment, not only is the collection effort to be increased but the firm may also have to incur losses.

## **ELEMENTS OF RECEIVABLES MANAGEMENT**

The elements of receivables management are as follows:

1. Formulation of credit policy
2. Credit evaluation
3. Credit granting decision
4. Monitoring receivables

### **Credit Policy**

The credit policy of a company can be regarded as a kind of trade-off between increased credit sales leading to increase in profit and the cost of having larger amount of cash locked up in the

form of receivables and the loss due to the incidence of bad debts. In a competitive market, the credit policy adopted by a company is considerably influenced by the practices followed by the industry. A change in the credit policy of a company, say, by extending credit period to 30 days, when the other companies are following a credit period of 15 days can result in such a high demand for the company's product that it cannot cope with. Further, other companies also may have to fall in line in the long run. It is assumed generally that such factors have already been taken into consideration before making changes in the credit policy of a company.

The term 'credit policy' encompasses the policy of a company in respect of the credit standards adopted, the period over which credit is extended to customers, any incentive in the form of cash discount offered, as also the period over which the discount can be utilized by the customers and the collection efforts made by the company.

### ***Variables Associated with Credit Policy***

The various variables associated with credit policy are:

1. Credit standards
2. Credit period
3. Cash discount
4. Collection programme

All these variables underlying a company's credit policy influence sales, the amount locked up in the form of receivables and some of the receivables turning sour and eventually becoming bad debts. While the variables of credit policy are related to each other, for the purpose of clarity in understanding, we shall follow what is technically known as comparative static analysis by considering each variable independently, holding some or all other constant, to study the impact of a change in that variable on the company's profit. It is also assumed that the company is making profits and has adequate unutilized capacity to meet the increased sales caused by a change in some variables without incurring additional fixed costs like wage and salaries, rent, etc.

**Credit standards:** When a company is confronted with the question of the standards to be applied to customers before deciding whether to extend credit or not, application of very stiff standards for the classification of customers to whom credit can be extended and to whom it cannot be extended is likely to result in a low level of sales, less amount of money locked up in the form of receivables, virtually no bad debt losses and less amount to be spent for collection. On the other hand, indiscriminate extension of credit without bothering much about the credit standards expected of the customers is likely to increase sales. But in its wake the company is more likely to be saddled with a large quantum of money locked up in the form of accounts receivable, higher incidence of bad debt losses and increased expenses on the collection front.

Let us assume for the time being (because in the section on credit evaluation, we shall consider these aspects) that the company has rated the customers into four categories ranging from 'high', 'good', 'fair' and 'limited' in the descending order of credit rating. Let us also assume that the company has been foregoing sales from 'fair' and 'limited' categories. The company has been contemplating to increase its sales from its existing level by liberalizing or relaxing its credit standard to some extent. What course of action should it take: liberalize or not? The answer to the above question lies in making a comparison of the incremental benefits associated with a

liberalized policy and the associated incremental costs. The decision to liberalize will be justified only when the net incremental benefits are positive. Before going into the analysis, we have to reckon with the factor that the earlier customers may take a lenient view in their paying habit once they come to know that the lowly rated customers of the company are taking a longer period for payment than what they themselves have been taking to pay. With a view to facilitating the exposition, it is assumed that the existing customer will not alter their paying habit even after liberalization of credit by the company (lest they be relegated to the lower rated groups) and the company can meet the increase in sales demand without incurring additional fixed cost as stated earlier on.

**Credit period:** The credit period refers to the length of time allowed to customers to pay for their purchases. It generally varies from 15 days to 60 days. If a firm allows, say, 45 days of credit with no discount to induce early payment, its credit terms are stated as net 45. Lengthening of the credit period pushes sales up by inducing existing customers to purchase more and attracting additional customers. At the same time, it increases the incidence of bad debt loss. A shortening of credit period will tend to lower sales, as customers decrease investment in receivables, and reduce the incidence of bad debt loss.

**Cash discount and collection:**

1. **Loans secured by receivables** *Accounts receivable* are amounts owed to a firm by its customers. They are created when trade credit is given to customers and are usually due within thirty to sixty days.
  - (a) A firm can pledge its accounts receivable as collateral to obtain short-term financing.
  - (b) A lender may advance 70 to 80 percent of the dollar amount of the receivables.
    - (i) Usually, the lender conducts a thorough investigation to determine the quality of the receivables.
    - (ii) If a favorable determination is made, the loan is approved.
  - (c) When the borrowing firm collects from a customer whose account has been pledged as collateral, it must turn the money over to the lender as partial repayment of the loan.
  - (d) An alternative approach is to notify the borrower's credit customers to make their payments directly to the lender.
2. **Factoring accounts receivable** Accounts receivable can be sold to a factoring company, or factor. A *factor* is a firm that specializes in buying other firms' accounts receivable.
  - (i) The factor buys the accounts receivable for less than their face value, but it collects the full amount when each account is due.
  - (ii) The factor's profit is thus the difference between the face value of the accounts receivable and the amount the factor has paid for them.
  - (iii) Even though the firm selling its accounts receivable gets less than face value, it does receive needed cash immediately.
  - (iv) Moreover, it has shifted both the task of collecting and the risk of nonpayment to the factor, which now owns the accounts receivable.

**Cash discount and its impact:** Cash discounts are offered by firms to induce prompt payments by debtors. In the case of cash discount, the incremental benefits arising out of additional sales and

reduction in the cost of funds locked up in the form of receivables have to be compared with the amount to be paid in the form of discount and a decision to provide liberalized cash discount has to be taken only when the incremental net benefit is positive.

### **Credit Evaluation and Credit Granting Decision**

Before a potential debtor wants to obtain credit for a loan, he must make evaluations of certain areas. There are five C's involved in credit evaluation. They are: character, credit report, capacity, cash flow, and collateral.

#### **Character**

The character of a potential debtor is an important consideration used by lenders in loan grant. A thorough check of the functioning of the potential debtor can be undertaken on the part of the lender during the investigation. Nevertheless, the lender may also have to consider first impression as a criterion. The fundamentals of a firm applying for a loan are a big factor to the decision for loan approval. A firm with a sound financial objective is likely to be granted a loan quickly and more possibly than a firm which is in bad shape, not just on the financial facet, but also on other aspects.

#### **Credit History**

Credit history is another important factor considered by lenders in their decision to grant and approve loan applications. The credit report is a record of a firm's past borrowing and reimbursing transactions. It also includes information about late payments and bankruptcy.

#### **Credit Rating**

Credit rating can be a part of the credit history of a firm. It is the rating of credit reputation or creditworthiness of a firm. The credit rating and report are significant to businesses in their intention to apply for a business line of credit.

The credit score is also an important scoring system of a business borrower. The score shows the worthiness of a firm for a credit.

For a business borrower, to earn the nods of several lenders, it has to build its credit history. The credit report is an important record of information to a lender. If the credit report does not contain substantial details of borrowing and repaying transactions, it is unlikely for a firm to be granted with a loan, unless the lender has certain conditions. A credit report can be tarnished. A credit score can be at its low. When these things happen to your credit background, it is unlikely for you to earn the approval of the lender for a loan. However, if your cash flow is good, there is a possibility for you to be granted a loan.

#### **Capacity**

Lenders may also have to check the liquidity of a firm. This can be done by checking the bank statements or a copy of the audited financial statements. In the case of businesses, lenders may have to obtain the financial statements of businesses and bank statements can be utilized to show the capacity of a borrower to settle and repay a line of credit. The capacity of the borrower to pay a loan is determined during credit evaluation and approval.

## Collateral

‘Collateral’ is a common term in credit. A lender seeks for security whenever the borrower defaults the loan payment. If no collateral is presented as security for a loan, it is likely that the lender will give the borrower a high-interest rate loan.

Credit evaluation is a process taken by the lender with the participation of the loan applicant. If you want to undergo this process, it is important to make substantial preparation. So you are more likely to obtain a loan quickly and less expensively.

## Monitoring Receivables

An important aspect of receivables management is to monitor the payment of receivables. The credit manager can employ several measures for this purpose, as explained below:

- (i) Days sales outstanding
- (ii) Ageing schedule
- (iii) Collection matrices are some of the measures employed.

The average collection period is based on year-end balance of receivables. For the purpose of internal control, monitoring has to be made more frequently. Further, year-end balance can be misleading when the sales are subject to seasonality or have grown towards the end of the year. For these reasons, two approaches, viz. day’s sales outstanding and aging schedule of receivables are followed for control purpose. These are described below.

## Day's Sales Outstanding

The average number of days’ sales outstanding at any time, say end of the month or end of the quarter, is obtained by the following formula, which is not very different from the usual formula for average collection period:

$$\text{Days' sales outstanding (DSO)} = \frac{\text{Accounts receivables at the time chosen}}{\text{Average daily sales}}$$

To illustrate the calculation of this measure, consider the monthly sales and month end accounts receivables for a product line as given in Table 15.1.

**Table 15.1** Sales and Receivables Data

<i>Month</i>	<i>Sales</i>	<i>Receivables</i>	<i>Month</i>	<i>Sales</i>	<i>Receivables</i>
January	200	460	July	200	340
February	225	360	August	200	360
March	230	315	September	220	360
April	150	310	October	230	390
May	150	300	November	245	500
June	180	320	December	250	520

If the average collection period is calculated at the end of each quarter, we get the following picture:

Quarter    average collection period

$$\text{First} = \frac{315}{(200 + 225 + 230)/90} = 43 \text{ days}$$
$$\text{Second} = \frac{320}{(150 + 150 + 180)/91} = 61 \text{ days}$$
$$\text{Third} = \frac{360}{(200 + 200 + 220)/92} = 53 \text{ days}$$
$$\text{Fourth} = \frac{520}{(230 + 245 + 250)/92} = 66 \text{ days}$$

In case the daily sales outstanding is within a pre-specified norm linked to the credit period followed by the company, then the status of receivables is regarded to be under control. In case it is found to be higher, then the collection policy has to be strengthened, as the collection is slow.

**Aging Schedule**

An aging schedule is a way of finding out if customers are paying their bills within the credit period prescribed in the company’s credit terms. Every day that a customer is late making payment on their account costs the company money from a cash flow point of view. So, preparing an aging schedule and acting upon with regard to the company’s collections policy is an important financial management step for a business firm.

The age-wise distribution of accounts receivables at a given time is depicted in the ageing schedule. For example, the ageing schedule at the end of various quarters may be as follows:

**Outstanding Accounts Receivable**

<i>Age</i>	<i>I Quarter</i>	<i>II Quarter</i>	<i>III Quarter</i>	<i>IV Quarter</i>
0–30	40%	42%	44%	46%
31–60	30%	28%	26%	25%
61–90	20%	22%	25%	23%
120	10%	8%	5%	6%

A comparison of ageing schedules at periodic intervals helps to identify change in the payment behaviour of customers.

The aging schedule can be compared with the credit period extended by the company. When the percentage of receivables belonging to higher age groups is above a stipulated norm action has to

be initiated before they turn into bad debts. If the company's credit terms are say 'net sixty days,' then control needs to be exercised in the form of follow up measures in respect of the bottom 20 percent accounts.

The average collection period and the ageing schedule have traditionally been popular measures for monitoring receivables. However, they suffer from a limitation. They are influenced by the sales pattern as well as the decreasing, average collection period and the ageing schedule will differ from what they would be if sales are constant. This holds even when the payment Behaviour of customers remains unchanged. The reason is simple: a greater portion of sales is billed currently. Similarly, decreasing sales lead to the same results. The reason here is that a smaller portion of sales is billed currently. It can be well explained with an example.

### Example

The following is an example of an accounts receivables aging schedule for a hypothetical company.

**Aging Schedule**

<i>Age of Account</i>	<i>Amount (₹)</i>	<i>% Total Value of Receivables</i>
0–10 days	20,000	20%
11–30 days	40,000	40%
31–60 days	20,000	20%
61–90 days	10,000	10%
Over 90 days	10,000	10%
	1,00,000	100%

This company has ₹ 1,00,000 in accounts receivable. They offer a discount if customers pay their bills in 10 days, which is the discount period. That's why the first line of the aging schedule is 0–10 days. The table reveals that 20% of the firm's customers take the offered cash discount.

The credit period for this firm is 30 days, so the second line of the aging schedule is 11–30 days. This line of the aging schedule shows how many customers pay their bills on time. For this company, 40% of the customers pay their bills during the credit period but don't take the discount. This means that 60% of the firm's customers pay their bills on time, a combination of the customers that take the discount and those who pay during the credit period. That's only a little over half of the firm's customers who pay their bills on time. For most companies, this is not enough.



A full 30% of the company's customers are delinquent with their payments. 20% are 31–60 days delinquent and 10% are 61–90 days delinquent. That is a sizable percentage of delinquent accounts. This company is undoubtedly suffering from a cash flow perspective because of these delinquencies. Their cash flow is probably low and they have to borrow short-term funds in order to cover these delinquent accounts with regard to their working capital. This means they are paying interest on short-term debt, which hurts their cash flow even more.

In addition, it seems that there may be a problem with the company's credit policy, collections policy, or both. The owner needs to re-evaluate the credit and collections policy and see if the policies need to be tightened up. Perhaps they are offering credit to marginal credit customers and that needs to be stopped. Perhaps they are not collecting aggressively enough.

Last, 10% of the company's credit customers are over 90 days past-due on their accounts. Usually, if a customer is between 90–120 days past due on a debt, that bill is seen as uncollectible and as a bad debt. In this example, this company has ₹ 10,000 in bad debts out of ₹ 1,00,000 in accounts receivable. This is another sign that something is wrong with the company's credit and/or collections policy. Bad debts are tax-deductible, but companies would rather not have them.

### **Collection Matrix**

In order study correctly the changes in the payment behaviour of customers, it is helpful to look at the pattern of collections associated with credit sales. Table 15.2 shows an illustrative collection matrix. For example, the credit sales during the month of January (the month of sales), 42 percent in February (the first following month), 36 percent in March (the second following month), and 12 percent in April (the third following month).

From the collection pattern, one can judge whether the collection is improving, stable, or deteriorating. A secondary benefit of such an analysis is that it provides a historical record of collection percentages that can be useful in projecting monthly receipts for each budgeting period.

**Table 15.2** Collection Matrix

<i>Percentage of Receivables Collected during the</i>	<i>January Sales</i>	<i>February Sales</i>	<i>March Sales</i>	<i>April Sales</i>	<i>May Sales</i>	<i>June Sales</i>
Month of sales	10	14	15	12	9	13
First following month	42	35	40	38	35	31
Second following month	36	40	21	26	26	26
Third following month	12	11	24	19	25	25
Fourth following month				5	5	5

Though various techniques have been discussed here for the management of accounts receivables, in practice very few Indian companies have a stated and systematic credit policy.

Companies have to strengthen their management of receivables by having explicit and articulate credit policies, an efficient collection programme and better coordination between production, sales and finance departments.

### Objective Type Questions

*State whether the following statements are true or false:*

- (a) Receivables constitute a significant portion of fixed assets.
- (b) The volume of sales is influenced by the credit policy of a firm.
- (c) Factoring is a form of financing receivables.
- (d) Trade-off between profitability and cost of maintaining receivables is important for effective receivables management.

### Review Questions

1. Write a note on the cost of maintaining receivables.
2. Explain the factors to be considered while formulating a credit policy.
3. Write a note on credit evaluation and credit granting decision.
4. Explain the different methods of monitoring receivables.
5. Describe the various elements of cash management.

# 16

## Chapter

# Ratio Analysis

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning, objectives and limitations of accounting ratios
- Significance of ratio analysis
- Types of ratios
- Operating ratios (occupancy percentages) and accounting ratios for hotel
- Du pont analysis
- Comparative statements and their meaning, uses and features
- Common size statements and their meaning, uses, features and limitations

### MEANING OF ACCOUNTING RATIOS

A ratio is a mathematical number calculated as a reference to relationship of two or more numbers and can be expressed as a fraction, proportion, percentage, and a number of times. Accounting ratios are an important tool of financial statement analysis. When the number is calculated by referring to two accounting numbers derived from the financial statements, it is termed *accounting ratio*. For example, if the gross profit of the business is ₹ 10,000 and the sales are ₹ 1,00,000, it can be said that the gross profit is 10% ( $10,000/1,00,000$ ) of the sales. This ratio is termed *gross profit ratio*. Similarly, inventory turnover ratio may be 6, which implies that inventory turns into sales six times in a year. It needs to be observed that accounting ratios exhibit relationship, if any, between accounting numbers extracted from financial statements. They are essentially derived numbers and their efficacy depends a great deal upon the basic numbers from which they are calculated. Hence, if the financial statements contain some errors, the derived numbers in terms of ratio analysis would also present an erroneous scenario. Further, a ratio must be calculated using

numbers which are meaningfully correlated. A ratio calculated by using two unrelated numbers would hardly serve any purpose. For example, the furniture of the business is ₹ 1,00,000 and purchases are ₹ 3,00,000. The ratio of purchases to furniture is 3 ( $3,00,000/1,00,000$ ), but it hardly has any relevance. The reason is that, there is no relationship between these two aspects.

## RATIO ANALYSIS

Financial analysis may be approached from the external or the internal viewpoint. External analysis is based upon existing or historical statements. Outside creditors and owners are motivated by considerations of risk versus return. Some of the questions outsiders are concerned with are:

- Do the food service organization's financial statements present the sort of picture that encourages continued support of the business?
- Is it a good enough picture to attract new funds?
- Given the financial position of the business, what sort of funds can be attracted?
- With the risks indicated by analysis of the financial statements, what sort of returns must be offered to attract more funds to the business, or even to retain existing commitments?

Owners prefer more cash to less cash; cash sooner rather than later; and cash inflows that have small, rather than wide, variance.

Management, in developing internal financial analysis, details internal planning statements that look of the future, usually in the form of budgets for a year to as long as five years, revised and updated yearly.

Analysing financial statement ratio trends help management know:

- Financial resources of the organization
- Ability to meet future obligations
- How profitable the business is. Basically, what ratios tell management is the pulling power, pressures, stresses and strains that work in the business. The credit analyst uses this information to help decide whether or not the food service establishment is a good credit risk. Management can use the same information to help decide the course of the business. Weakening trends of financial ratios should set in motion corrective actions that enable the business to avoid failure. Management gains a better idea of the financial health of the business by taking the various ratios together, rather than by examining each ratio independently. Ratios alone never explain or evaluate anything by themselves. The reasons for the trends over time are the important thing: ratios only indicate the trouble spots that need improvement.

## Objectives of Ratio Analysis

Ratio analysis is a crucial part of interpretation of results revealed by the financial statements. It provides users with vital financial information and points out the areas which require investigation. Ratio analysis is a technique which involves regrouping of data by application of arithmetical relationships, though its interpretation is a complex matter. It requires a fine understanding of the

way and the rules used for preparing financial statements. Once done effectively, it provides a wealth of information which helps the analyst:

1. To know the areas of the business which need more attention.
2. To know about the potential areas which can be improved with the effort in the desired direction.
3. To provide a deeper analysis of the profitability, liquidity, solvency and efficiency levels in the business.
4. To provide information for making cross-sectional analysis by comparing the performance with the best industry standards.
5. To provide information derived from financial statements useful for making projections and estimates for the future.

### **Advantages of Ratio Analysis**

Ratio analysis, if appropriately done, improves the user's understanding of the efficiency with which the business is being conducted. The numerical relationships throw light on many latent aspects of the business. If correctly analysed, the ratios make us understand various problem areas as well as the bright spots of the business. The knowledge of problem areas helps management to take care of them in future. The knowledge of areas which are working better helps you improve the situation further. It must be emphasized that ratios are means to an end rather than the end in themselves. The following are some of the advantages of ratio analysis:

#### ***Helps to Understand Efficacy of Decisions***

Ratio analysis helps understand whether the business firm has taken the right kind of operating, investing and financing decisions. It indicates how far they have helped in improving the performance.

#### ***Simplify Complex Figures and Establish Relationships***

Ratios help in simplifying the complex accounting figures and bring out their relationships. They summarize the financial information effectively and assess the managerial efficiency, firm's creditworthiness, earning capacity, etc.

#### ***Helpful in Comparative Analysis***

Ratios are not calculated for one year only. When many years figures are kept side by side, they help a great deal in exploring the trends visible in the business. The knowledge of the trend helps in making projections about the business, which is a very useful feature.

#### ***Identification of Problem Areas***

Ratios help business in identifying the problem areas as well as the bright areas of the business. Problem areas would need more attention and bright areas will need polishing to have still better results.

### ***Enables SWOT Analysis***

Ratios help a great deal in explaining the changes occurring in the business. The information of change helps the management a great deal in understanding the current threats and opportunities and allows business to do its own SWOT (Strength-Weakness-Opportunity-Threat) analysis.

### ***Various Comparisons***

Ratios help comparisons with certain benchmarks to assess as to whether the firm's performance is better or otherwise. For this purpose, the profitability, liquidity, solvency, etc. of a business may be compared:

- (i) Over a number of accounting periods with itself (intra-firm comparison/time series analysis)
- (ii) With other business enterprises (inter-firm comparison/cross-sectional analysis)
- (iii) With standards set for that firm/industry (comparison with standard (or industry) expectations).

### ***Limitations of Ratio Analysis***

If the financial statements are not correctly prepared, the results of the ratio analysis will also be incorrect. Thus, the limitations of financial statements also form the limitations of the ratio analysis. Hence, to interpret the ratios, the user should be aware of the rules followed in the preparation of financial statements and also their nature and limitations. The limitations of ratio analysis which arise primarily from the nature of financial statements are as under:

#### ***Limitations of Accounting Data***

Accounting data “reflect a combination of recorded facts, accounting conventions and personal judgements and conventions applied. For example, profit of the business is not a precise and final figure. It is merely an opinion of the accountant based on application of accounting policies. The soundness of the judgement necessarily depends on the competence and integrity of those who make them and on their adherence to Generally Accepted Accounting Principles (GAAP) and Conventions.” Thus, the financial statements may not reveal the true state of affairs and so the ratios will also not give the true picture.

#### ***Ignores Price-level Changes***

Financial accounting is based on stable money measurement principle. It implicitly assumes that price level changes are either non-existent or minimal. But the truth is otherwise. We are normally living in inflationary economies where the power of money declines constantly. A change in the price level makes analysis of financial statement of different accounting years meaningless because accounting records ignore changes in the value of money.

#### ***Ignores Qualitative or Non-monetary Aspects***

Accounting provides information about quantitative (or monetary) aspects of business. Hence, the ratios also reflect only the monetary aspects, ignoring completely the non-monetary (qualitative) factors.

### **Variations in Accounting Practices**

There are differing accounting policies for the valuation of stock, calculation of depreciation, treatment of intangibles, definition of certain financial variables, etc. available for various aspects of business transactions. These variations leave a big question mark on the cross-sectional analysis. As there are variations in accounting practices followed by different business enterprises, a valid comparison of their financial statements is not possible.

### **Forecasting**

Forecasting of future trends based only on historical analysis is not feasible. Proper forecasting requires consideration of non-financial factors as well.

The various limitations of ratios are:

1. *Means and not the end:* Ratios are means to an end, rather than end in itself.
2. *Lack of ability to resolve problems:* Their role is essentially indicative and of whistle blowing and not providing a solution to the problem.
3. *Lack of standardized definitions:* There is a lack of standardized definitions of various concepts used in ratio analysis. For example, there is no standard definition of liquid liabilities. Normally, it includes all current liabilities, but sometimes it refers to current liabilities less bank overdraft.
4. *Lack of universally accepted standard levels:* There is no universal yardstick which specifies the level of ideal ratios. There is no standard list of the levels universally acceptable, and, in India, the industry averages are also not available.
5. *Ratios based on unrelated figures:* A ratio calculated for unrelated figures would essentially be a meaningless exercise. For example, creditors of ₹ 1,00,000 and furniture of ₹ 1,00,000 represent a ratio of 1:1. But it has no relevance to assess efficiency or solvency. Hence, ratios should be used with due consideration of their limitations while evaluating the performance of an organization and planning the future strategies for its improvement.

### **TYPES OF RATIOS**

There is a two-way classification of ratios: (1) traditional classification and (2) functional classification. The traditional classification has been on the basis of financial statements to which the determinants of ratios belong. On this basis, the ratios are classified as follows:

#### **Income Statement Ratios**

A ratio of two variables from the income statement is known as *income statement ratio*. For example, the ratio of gross profit to sales, known as gross profit ratio, is calculated using both figures from the income statement.

#### **Balance Sheet Ratios**

In case both variables are from the balance sheet, it is classified as *balance sheet ratios*. For example, the ratio of current assets to current liabilities, known as current ratio, is calculated using both figures from the balance sheet.

### **Composite Ratios**

If a ratio is computed with one variable from income statement and another variable from balance sheet, it is called *composite ratio*. For example, the ratio of credit sales to debtors and bills receivable, known as debtor turnover ratio, is calculated using one figure from income statement (credit sales) and another figure from balance sheet (debtors and bills receivable).

Although accounting ratios are calculated by taking data from financial statements, classification of ratios on the basis of financial statements is rarely used in practice. It must be recalled that the basic purpose of accounting is to throw useful light on the financial performance (profitability) and financial position (its capacity to raise money and invest them wisely) as well as changes occurring in financial position (possible explanation of changes in the activity level).

As such, the alternative classification (functional classification) based on the purpose, for which a ratio is computed, is the most commonly used classification which are as follows:

### **Liquidity Ratios**

To meet its commitments, business needs liquid funds. The ability of the business to pay the amount due to stakeholders as and when it is due is known as liquidity, and the ratios calculated to measure it are known as 'liquidity ratios'. They are essentially short-term in nature.

### **Solvency Ratios**

Solvency of business is determined by its ability to meet its contractual obligations towards stakeholders, particularly towards external stakeholders, and the ratios calculated to measure solvency position are known as 'solvency ratios'. They are essentially long-term in nature.

### **Activity (or Turnover) Ratios**

This refers to the ratios that are calculated for measuring the efficiency of operation of business based on effective utilization of resources. Hence, these are also known as 'efficiency ratios'.

### **Profitability Ratios**

It refers to the analysis of profits in relation to sales or funds (or assets) employed in the business and the ratios calculated to meet this objective are known as 'profitability ratios'.

### **Liquidity Ratios**

Liquidity ratios are calculated to have indications about the short-term solvency of the business, i.e. the firm's ability to meet its current obligations. These are analysed by looking at the amounts of current assets and current liabilities in the balance sheet. These include bank overdraft, creditors, outstanding expenses, bills payable, income received in advance. The two ratios included in this category are current ratio and liquid ratio.

### **Current Ratio**

Liquidity ratios are used in the analysis of a business's ability to meet its short-term obligations as they become due. The current ratio is probably the most commonly used liquidity ratio. This



ratio expresses the relationship between the total current assets and the total current liabilities of the food service establishment.

Current ratio is the proportion of current assets to current liabilities. It is expressed as follows:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current assets include cash in hand, bank balance, debtors, bills receivable, stock, prepaid expenses, accrued income, and short-term investments (marketable securities).

Current liabilities include creditors, bills payable, outstanding expenses, provision for taxation net of advance tax, bank overdraft, short-term loans, income received in advance, etc.

A current ratio of about 1:1 is generally considered to be reasonable. The food service industry typically has a low current ratio because of (i) minimum credit extended to customers, (ii) low inventories on hand, and (iii) quick cash turnover because of rapid inventory turnover. Popular thought is that the higher the ratio, the better shape the business is in. However, a high ratio, by itself, does not tell: (i) whether cash is being used to best advantage, and (ii) the distribution of current assets—whether receivables and/or inventory may be too high.

**Significance:** It provides a measure of degree to which current assets cover current liabilities. The excess of current assets over current liabilities provides a measure of safety margin available against uncertainty in realization of current assets and flow of funds. The ratio should be reasonable. It should neither be very high or very low. Both the situations have their inherent disadvantages. A very high current ratio implies heavy investment in current assets, which is not a good sign as it reflects under utilization or improper utilization of resources. A low ratio endangers the business and puts it at risk of facing a situation where it will not be able to pay its short-term debt on time. If this problem persists, it may affect the firm's creditworthiness adversely. Normally, it is advocated to have this ratio as 2:1.

### **Quick Ratio**

It is the ratio of quick (or liquid) asset to current liabilities. It is expressed as

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Quick Liabilities}}$$

The quick assets are defined as those assets which are quickly convertible into cash. While calculating quick assets, we exclude the closing stock and prepaid expenses from the current assets. Because of exclusion of non-liquid current asset, it is considered better than current ratio as a measure of liquidity position of the business. It is calculated to serve as a supplementary check on the liquidity position of the business and is therefore, also known as 'Acid-Test Ratio'.

**Significance:** The ratio provides a measure of the capacity of the business to meet its short-term obligations without any flaw. Normally, it is advocated to be safe to have a ratio of 1:1 as unnecessarily low ratio will be very risky and a high ratio suggests unnecessarily deployment of resources in otherwise less profitable short-term investments.

## Solvency Ratios

The persons who have advanced money to the business on long-term basis are interested in safety of their payment of interest periodically as well as the repayment of principal amount at the end of the loan period. Solvency ratios are calculated to determine the ability of the business to service its debt in the long run. The following ratios are normally computed for evaluating solvency of the business.

1. Debt equity ratio
2. Debt ratio
3. Proprietary ratio
4. Total Assets to Debt Ratio
5. Interest Coverage Ratio.

### Debt-equity Ratio

Solvency is the ability of a business to meet its obligations. There are two basic ways to finance: (1) the owners may supply the money or (2) a combination of owner's money and debt financing (borrowing may be used). Leverage refers to the amount of long-term debt used to finance the asset of the restaurant as compared to the amount of the owner's investment. Leverage ratios are used to show the relationship between the amount of debt and owner's monies used to finance the assets of the restaurant. The percentage of total debt (liabilities) to the total owner's equity (net worth) ratio shows the percentage of the owner's equity in the business.

Debt equity ratio measures the relationship between long-term debt and equity. If debt component of the total long-term funds employed is small, outsiders feel more secure. From security point of view, capital structure with less debt and more equity is considered favourable as it reduces the chances of bankruptcy. Normally, it is considered to be safe if debt equity ratio is 2:1. It is computed as follows:

$$\text{Debt Equity Ratio} = \frac{\text{Long-term Debt}}{\text{Shareholder's Fund}}$$

Where Shareholders Funds = Equity Share Capital + Reserves and Surplus (equity)  
 – Fictitious Assets + Preference Share Capital

Alternatively, it can be calculated as Non-fictitious Total Assets – Total External Liabilities

$$\text{Long-term Funds} = \text{Debentures} + \text{Long-term Loans}$$

It is advantageous to employ leverage if the cost of borrowed funds is less than the earnings which can be generated from their use. It is important to equate trends, over time. The debt to equity ratio is typically low in the food service industry because of the: (i) heavy investment in fixed assets offset by heavy liabilities with a long-term repayment programme, and (ii) low working capital requirements. The higher the percentage, the more money the owner has in the business and the safer his creditors. They are safer because more owner's equity is there to cushion creditors against a loss. However, it may also show that the owner is: (i) too conservative, unwilling to take any risks; (ii) not using his funds to the best advantage; and (iii) not realizing the maximum potential of his business. A small amount invested in the business by the owner might encourage the owner to speculate with outsider's money.

**Significance:** This ratio measures the degree of indebtedness of an enterprise and gives an idea to the long-term lender regarding the extent of security of the debt. As indicated earlier, a low debt equity ratio reflects more security. A high ratio, on the other hand, is considered risky as it may put the firm into difficulty in meeting its obligations to outsiders. However, from the perspective of the owners, greater use of debt trading on equity may help in ensuring higher returns for them if the rate of earnings on capital employed is higher than the rate of interest payable. But it is considered risky and so, with the exception of a few businesses, the prescribed ratio is limited to 2:1. This ratio is also termed leverage ratio.

### **Debt Ratio**

Debt ratio refers to the ratio of long-term debt to the total of external and internal funds (capital employed or net assets). It is computed as follows:

$$\text{Debt Ratio} = \frac{\text{Long-Term Debt}}{\text{Capital Employed (or Net Assets)}}$$

Capital employed is equal to the long-term debt + shareholders' fund.

Alternatively, it may be taken as net assets which are equal to the total non-fictitious assets – current liabilities.

**Significance:** Like debt equity ratio, it shows proportion of long-term debt in capital employed. Low ratio provides security to creditors and high ratio helps management in trading on equity. In the above case, the debt ratio is less than half which indicates reasonable funding by debt and adequate security of debt. It may be noted that debt ratio can also be computed in relation to total assets. In that case, it usually refers to the ratio of total debt (long-term debt + current liabilities) to total assets, i.e. total of fixed and current assets (or shareholders funds + long-term debt + current liabilities), and is expressed as

Debt ratio = Total debt/Total assets
--------------------------------------

### **Proprietary Ratios**

Proprietary ratio expresses the relationship of proprietor's (shareholders) funds to net assets and is calculated as follows:

$$\text{Proprietary Ratio} = \text{Shareholders funds/Capital employed (or net assets)}$$

**Significance:** Higher proportion of shareholders' funds in financing the assets is a positive feature as it provides security to creditors. This ratio can also be computed in relation to total assets in lieu of net assets (capital employed). It may be noted that the total of debt ratio and proprietary ratio will be equal to 1.

### **Total Assets to Debt Ratio**

This ratio measures the extent of the coverage of long-term debt by assets. It is calculated as

$$\text{Total assets to Debt Ratio} = \text{Total assets/Long-term debt}$$

Taking the data of Illustration 8, this ratio will be worked out as follows:

$$\text{₹ } 13,90,000 / \text{₹ } 1,50,000 = 9.27 \text{ times}$$

The higher ratio indicates that assets have been mainly financed by owner's funds, and the long-term debt is adequately covered by assets. It is better to take the net assets (capital employed) instead of total assets for computing this ratio also. It will be observed that in that case, the ratio will be the reciprocal of the debt ratio.

**Significance:** This ratio primarily indicates the rate of external funds in financing the assets and also the extent of coverage of these external funds by assets.

### **Interest Coverage Ratio**

It is a ratio which deals with the servicing of interest on loan. It is a measure of security of interest payable on long-term debt. It expresses the relationship between profits available for payment of interest and the amount of interest payable. It is calculated as follows:

$$\text{Interest Coverage Ratio} = \frac{\text{Net Profit before Interest and Tax}}{\text{Interest on long term debt}}$$

**Significance:** It reveals the number of times interest on long-term debt is covered by the profits available for interest. A higher ratio ensures safety of interest payment debt and it also indicates availability of surplus for shareholders.

### **Activity (or Turnover) Ratios**

The turnover ratios basically exhibit the activity levels characterized by the capacity of the business to make more sales or turnover. The activity ratios express the number of times assets employed, or, for that matter, any constituent of assets, is turned into sales during an accounting period. Higher turnover ratio means better utilization of assets and signifies improved efficiency and profitability, and as such is known as *efficiency ratios*. The important activity ratios calculated under this category are:

1. Stock turn-over
2. Debtors (Receivable) turnover
3. Creditors (Payable) turnover
4. Investment (Net Assets) turnover
5. Fixed assets turnover
6. Working capital turnover

### **Stock (or Inventory) Turnover Ratio**

It determines the number of times stock is turned in sales during the accounting period under consideration. It expresses the relationship between the cost of goods sold and the stock of goods. The formula for its calculation is as follows:

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Good Sold}}{\text{Average Stock}}$$

Average stock refers to arithmetic average of opening and closing stock, and the cost of goods sold means sales less gross profit.

**Significance:** It studies the frequency of conversion of stock of finished goods into sales. It is also a measure of liquidity. It determines how many times stock is purchased or replaced during a year. Low turnover of stock may be due to bad buying, obsolete stock, etc. and is a danger signal. High turnover is good, but it must be carefully interpreted as it may be due to buying in small lots or selling quickly at low margin to realize cash. Thus, it throws light on utilization of stock of goods.

### **Debtors (Receivables) Turnover Ratio**

It expresses the relationship between credit sales and debtors. It is calculated as follows:

$$\text{Debtors Turnover ratio} = \text{Net Credit sales} / \text{Average Accounts Receivable}$$

Average Account Receivable = (Opening Debtors and Bills Receivable + Closing Debtors and Bills Receivable)/2

It needs to be noted that debtors should be taken before making any provision for doubtful debts.

**Significance:** The liquidity position of the firm depends upon the speed with which debtors are realized. This ratio indicates the number of times the receivables are turned over and converted into cash in an accounting period. Higher turnover means speedy collection from debtors. This ratio also helps in working out the average collection period, ratio calculated by dividing the days/months in a year by debtors turnover ratio.

### **Creditors (Payable) Turnover Ratio**

Creditors turnover ratio indicates the pattern of payment of accounts payable. As accounts payable arise on account of credit purchases, it expresses the relationship between credit purchases and accounts payable. It is calculated as follows:

$$\text{Creditors Turnover ratio} = \text{Net Credit purchases} / \text{Average accounts payable}$$

Where Average account payable = (Opening Creditors and Bills Payable + Closing Creditors and Bills Payable)/2

**Significance:** It reveals average payment period. Lower ratio means credit allowed by the supplier is for a long period or it may reflect delayed payment to suppliers which is not a very good policy as it may affect the reputation of the business. The average period of payment can be worked out by days/months in a year by the turnover rate.

### **Investment (Net Assets) Turnover Ratio**

It reflects the relationship between the net sales and the capital employed in the business. Higher turnover means better liquidity and profitability. It is calculated as follows:

$$\text{Investment (Net Assets) Turnover ratio} = \text{Net Sales} / \text{Capital Employed}$$

Capital turnover, which studies turnover of capital employed (Net Assets), is analysed further by the following two turnover ratios:

(a) Fixed Assets Turnover: It is computed follows:

$$\text{Fixed asset turnover} = \text{Net Sales} / \text{Net Fixed Assets}$$

(b) Working Capital Turnover: It is calculated as follows:

$$\text{Working Capital Turnover} = \text{Net Sales} / \text{Working Capital}$$

**Significance:** High fixed assets turnover ratio and working capital turnover ratio is a good sign and implies efficient utilization of resources. Utilization of capital employed or, for that matter, any of its components is revealed by the turnover ratios. Higher turnover reflects efficient utilization resulting in higher liquidity and profitability in the business.

### Profitability Ratios

The profitability or financial performance is mainly summarized in income statement. Profitability ratios are calculated to analyse the earning capacity of the business, which is the outcome of utilization of resources employed in the business. There is a close relationship between the profit and the efficiency with which the resources employed in the business are utilized. The various ratios which are commonly used to analyse the profitability of the business are:

1. Gross profit ratio
2. Operating ratio
3. Operating profit ratio
4. Net profit ratio
5. Return on investment (ROI) or return on capital employed (ROCE)
6. Return on net worth (RONW)
7. Earnings per share
8. Book value per share
9. Dividend payout ratio
10. Price earning ratio

### Gross Profit Ratio

Gross profit ratio as a percentage of sales is computed to have an idea about gross margin. It is computed as follows:

$$\text{Gross Profit Ratio} = \text{Gross Profit} / \text{Net Sales} \times 100$$

**Significance:** It indicates gross margin or mark-up on products sold. There is no standard norm for its comparison. It also indicates the margin available to cover operating expenses, non-operating expenses, etc. Change in gross profit ratio may result from change in selling price or cost of sales or a combination of both. A low ratio may indicate unfavourable purchase and sales

policy. It must be interpreted carefully as valuation of stock also affects its computation. Higher gross profit ratio is always a good sign.

### **Operating Ratio**

It is computed to analyse cost of operation in relation to sales. It is calculated as follows:

$$\text{Operating Ratio} = (\text{Cost of Sales} + \text{Operating Expenses}) / \text{Net Sales} \times 100$$

Operating expenses include office expenses, administrative expenses, selling expenses and distribution expenses. Cost of operation is determined by excluding non-operating incomes and expenses such as loss on sale of assets, interest paid, dividend received, loss by fire, speculation gain, and so on. It is calculated to reveal operating margin. It may be computed directly or as a residual of operating ratio.

### **Operating Profit Ratio**

It is calculated to reveal operating margin. It may be computed directly or as a residual of operating ratio.

$$\text{Operating Profit Ratio} = \text{Operating Profit} / \text{Sales} \times 100$$

where Operating Profit = Sales – Cost of Operation

**Significance:** Operating ratio is computed to express cost of operations excluding financial charges in relation to sales. A corollary of it is ‘Operating Profit Ratio’. It helps to analyse the performance of business and throws light on the operational efficiency of the business. It is very useful for inter-firm as well as intra-firm comparisons. Lower operating ratio is a very healthy sign.

### **Net Profit Ratio**

Net profit ratio is based on all inclusive concept of profit. It relates sales to net profit after operational as well as non-operational expenses and incomes. It is calculated as under:

$$\text{Net Profit Ratio} = \text{Net profit} / \text{Sales} \times 100$$

Generally, net profit refers to Profit after Tax (PAT).

**Significance:** It is a measure of net profit margin in relation to sales. Besides revealing profitability, it is the main variable in computation of Return on Investment. It reflects the overall efficiency of the business, and assumes great significance from the point of view of investors.

### **Return on Capital Employed or Investment (ROCE or ROI)**

It explains the overall utilization of funds by a business enterprise. Capital employed means the long-term funds employed in the business and includes shareholders’ fund, debentures and long-term loans. Alternatively, capital employed may be taken as the total of non-fictitious assets

current liabilities. Profit refers to the Profit before Interest and Tax (PBIT) for computation of this ratio. Thus, it is computed as follows:

$$\text{Return on Investment (or Capital Employed)} = \frac{\text{Profit before Interest and Tax}}{\text{Capital Employed}} \times 100$$

**Significance:** It measures return on capital employed in the business. It reveals the efficiency of the business in utilization of funds entrusted to it by shareholders, debenture-holders and long-term liabilities. For inter-firm comparison, return on capital employed, which reveals overall utilization of fund, is considered a good measure of profitability. It also helps in assessing whether the firm is earning a higher return on capital employed as compared to the interest rate paid.

### ***Return on Shareholders' Fund***

This measures rate of return or yield on the owner's investment in the hotel/restaurant. This ratio is very important from shareholders' point of view in assessing whether their investment in the firm generates a reasonable return or not. It should be higher than the return on investment, otherwise it would imply that the company's funds have not been employed profitably. A better measure of profitability from shareholders' point of view is obtained by determining return on total shareholders fund; it is also termed Return on Net Worth (RONW) and is calculated as under:

$$\text{Return on Shareholder's Fund} = \frac{\text{Profit after tax}}{\text{Shareholders Fund}}$$

A restaurant has a major investment in assets. It is essential that there be sufficient earnings to cover the cost of financing and to provide a satisfactory return to the investors. This ratio expresses the percentage relationships between the net profit after all expenses including income taxes are deducted and the average stockholders' equity in the business.

### ***Earnings Per Share***

The ratio is defined as

$$\text{EPS} = \frac{\text{Profit available for equity shareholders}}{\text{No. of Equity Shares}}$$

In this context, earnings refer to profit available for an equity shareholder which is worked out as Profit after Tax–Dividend on Preference Shares.

This ratio is very important from equity shareholders point of view and as also for the share price in the stock market. This also helps comparison with other firm's to ascertain its reasonableness and capacity to pay dividend.

### ***Book Value Per Share***

This ratio is calculated as

$$\text{Book Value per share} = \frac{\text{Equity shareholders' funds}}{\text{No. of Equity Shares}}$$



Equity shareholder’s funds refer to Shareholder’s Funds–Preference Share Capital. This ratio is again very important from equity shareholder’s point of view as it gives an idea about the value of their holding and affects market price of the shares.

***Dividend Payout Ratio***

This refers to the proportion of earning that is distributed against the shareholders. It is calculated as

$$\text{Dividend Payout Ratio} = \frac{\text{Dividend per share}}{\text{Earnings per share}}$$

This reflects the company’s dividend policy and growth in owner’s equity.

***Price Earning Ratio***

The ratio is defined as

$$\text{P/E Ratio} = \text{Market price of a Share/Earnings per Share}$$

It reflects the investor’s expectation about the growth in the firm’s earnings and reasonableness of the market price of its shares. P/E ratios vary from industry to industry and company to company in the same industry, depending upon the investor’s perception of their future.

It may be noted that various ratios are intimately correlated with each other. Sometimes, the combined information regarding two or more ratios is given and some missing figure is to be calculated. In such a situation, the formula of the ratios will help in working out the missing figures.

**OPERATING RATIOS (OCCUPANCY PERCENTAGES) AND ACCOUNTING RATIOS FOR HOTELS**

Ratio is a means of measuring the relationship between Rooms available and Rooms sold, between Sales and Net Profit, investment and Net profit, etc. A ratio is a number expressed in terms of another number. The ratio may be expressed as a rational figure or as a percentage.

The following are the two types of ratios which are more common in hotels.

**Operating Ratio**

Operating ratio is calculated with the help of information obtained from summaries, analysis sheets and statements prepared every day by the various departments of a hotel, which is calculated for a short period (for a day or a week). The following are the various operating ratios required by the management for their information and guidance:

**Room Occupancy Percentage**

ROP is worked out on the basis of the number of lettable rooms and the number of rooms occupied by the guests. To calculate the lettable rooms from the total rooms available deduct the rooms occupied by manager or the rooms used for operational purposes.

$$\text{ROP} = \frac{\text{No. of Rooms Occupied}}{\text{No. of Lettable Rooms}} \times 100$$

**Bed Occupancy Percentage**

BOP is worked out on the basis of total number of beds available for guests and the number of beds occupied by the guests. For this purpose, we have to take into account all the beds of single rooms, double rooms, etc.

$$\text{BOP} = \frac{\text{No. of Beds Occupied}}{\text{Total No. of Beds}} \times 100$$

**Double Occupancy Percentage**

Double Occupancy percentage means rented rooms occupied twice at different intervals by two different persons during the day. In other words, it means a room sold twice during the day. There are two methods of calculating DOP. Some hotels calculate DOP on the total number of rooms sold, but other hotels calculate on the availability of total rooms in the hotel.

**Method I:**

$$\text{DOP} = \frac{\text{No. of Guests} - \text{No. of rooms occupied}}{\text{No. of rooms occupied}} \times 100$$

**Method II:**

$$\text{DOP} = \frac{\text{No. of Guests} - \text{No. of room occupied}}{\text{Total No. of lettable rooms available in the hotel}} \times 100$$

**Daily Occupancy**

Daily Occupancy is calculated on the basis of the following:

- (i) No. of guests brought forward in the beginning of the day from previous day.
- (ii) No. of guests arrived during the day.
- (iii) No. of guests checked out during the day.

$$\text{DO} = \text{No. of guests B/F in the beginning of the day} + \text{No. of guests arrived during the day} - \text{No. of guests checked out during the day}$$

**Restaurant/Seat Turnover Ratio**

It shows the number of meals served or sold in relation to the normal seating capacity of the restaurant.

$$\text{Seat Turnover Ratio} = \frac{\text{Meals Served}}{\text{Seating Capacity}}$$

**Average Check**

This ratio is prepared in order to ascertain the purchasing power of the average customer of the restaurant.

$$\text{Average Check} = \frac{\text{Total Revenue of Restaurant}}{\text{Number of Covers Sold}}$$

**Sales per Employee**

This ratio is prepared to find the relation of the total work load of the restaurant or F&B Department with the total workplace of the personnel engaged in the service to enable adequate staffing for the purpose.

$$\text{Sales per Employee} = \frac{\text{F\&B (P)/F\&B (S)}}{\text{Total Workforce}}$$

**Sales per Menu**

This ratio is prepared to ascertain the popularity of each menu item during the season as well as during off season in order to do menu planning properly and productivity.

$$\text{Sales per Menu} = \frac{\text{Number of menu sold} \times 100}{\text{Value of sales of those menus}}$$

**Ratios Required for Management Decision Making**

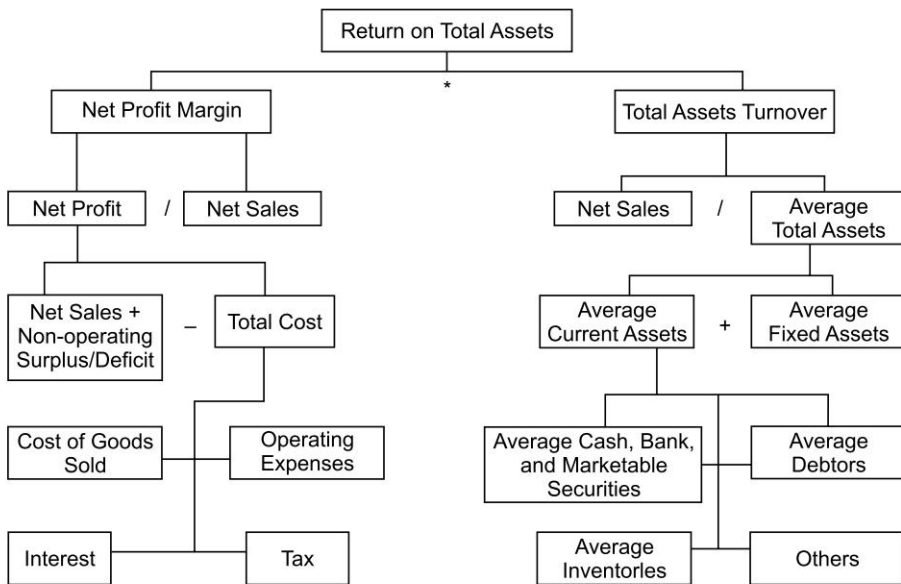
1. Average Rate per Room =  $\frac{\text{Total Rooms Revenue}}{\text{No. of occupied Rooms}}$
2. Average Rate per Guest =  $\frac{\text{Total Revenue from Guests}}{\text{Total No. of Guests}}$
3. Average Income per Guest =  $\frac{\text{Total Income Food and Beverage}}{\text{No. of Guests}}$

4. Percentage of Food & Beverage Sales =  $\frac{\text{Food \& Beverage Sales}}{\text{Total Room Sale}} \times 100$
5. Percentage of other Income in room sale =  $\frac{\text{All other Income (except F\&B)}}{\text{Room Sale}} \times 100$

## DU PONT ANALYSIS

The Du Pont Company of the US pioneered a system of financial analysis, which has received widespread recognition and acceptance. This system of analysis considers important interrelationships between different elements based on the information found in the financial statements.

The Du Pont analysis can be depicted via the chart shown in Fig. 16.1.



**Figure 16.1** Du Pont Analysis

At the apex of the Du Pont chart is the Return On Total Assets (ROTA), defined as the product of the Net Profit Margin (NPM) and the Total Assets Turnover Ratio (TATR). As a formula, this can be shown as follows:

$$(\text{Net profit/Total asset}) = (\text{Net profit/Net sales}) * (\text{Net sales/Total assets})$$

(ROTA)      (NPM)      (TATR)

Such decomposition helps in understanding how the return on total assets is influenced by the net profit margin and the total assets turnover ratio.

The left side of the Du Pont chart shows details underlying the net profit margin ratio. A detailed examination of this side presents areas where cost reductions may be effected to improve the net profit margin.

The right side of the chart highlights the determinants of total assets turnover ratio. If this study is supplemented by the study of other ratios such as inventory, debtors, fixed asset turnover ratios, a deeper insight into efficiencies and inefficiencies of asset utilization can be got.

The basic Du Pont analysis can be extended to explore the determinants of the Return On Equity (ROE).

$$\begin{aligned} \text{Return on equity} &= \text{Asset turnover} * \text{Net profit margin} * \text{Leverage} \\ (\text{Net profit/Equity}) &= (\text{Net profit/Sales}) * (\text{Sales/Total assets}) * (\text{Total assets/Equity}) \\ (\text{ROE}) &\quad (\text{NPM}) \quad (\text{TATR}) \quad 1/(1-\text{DR}) \end{aligned}$$

where DR is the debt ratio = debt (D)/assets (A)

Breaking ROE into these three parts allows evaluation of how well one can manage the company's assets, expenses, and debt. A manager has basically three ways of improving operating performance in terms of ROA and ROE. These are:

- Increase capital asset turnover
- Increase operating profit margins
- Change financial leverage

Each of these primary drivers is impacted by the specific decisions on cost control, efficiency productivity, marketing choices, etc.

### Importance of Du Pont Analysis

Any decision affecting the product prices, per unit costs, volume or efficiency has an impact on the profit margin or turnover ratios. Similarly, any decision affecting the amount and ratio of debt or equity used will affect the financial structure and the overall cost of capital of a company. Therefore, these financial concepts are very important to evaluate as every business is competing for limited capital resources. Understanding the interrelationships among the various ratios such as turnover ratios, leverage, and profitability ratios helps companies to put their money in areas where the risk adjusted return is the maximum.

## COMPARATIVE STATEMENTS

Comparative statements are financial statements that cover a different time frame, but are formatted in a manner that makes comparing line items from one period to those of a different period an easy process. This quality means that the comparative statement is a financial statement that lends itself well to the process of comparative analysis. Many companies make use of standardized formats in accounting functions that make the generation of a comparative statement quick and easy.

### Importance and Uses of Comparative Statements

The benefits of a comparative statement are varied for a corporation. Because of the uniform format of the statement, it is a simple process to compare the gross sales of a given product or all products of the company with the gross sales generated in a previous month, quarter, or year. Comparing generated revenue from one period to a different period can add another dimension to

analysing the effectiveness of the sales effort, as the process makes it possible to identify trends such as a drop in revenue in spite of an increase in units sold.

Along with being an excellent way to broaden the understanding of the success of the sales effort, a comparative statement can also help address changes in production costs. By comparing line items that catalogue the expense for raw materials in one quarter with another quarter where the number of units produced is similar can make it possible to spot trends in expense increases, and thus help isolate the origin of those increases. This type of data can prove helpful to allowing the company to find raw materials from another source before the increased price for materials cuts into the overall profitability of the company.

A comparative statement can be helpful for just about any organization that has to deal with finances in some manner. Even non-profit organizations can use the comparative statement method to ascertain trends in annual fund raising efforts. By making use of the comparative statement for the most recent effort and comparing the figures with those of the previous year's event, it is possible to determine where expenses increased or decreased, and provide some insight in to how to plan the following year's event.

### Features of Comparative Statements

1. A comparative statement adds meaning to the financial data.
2. It is used to effectively to measure the conduct of the business activities.
3. Comparative statement analysis is used for intra-firm analysis and inters-firm analysis.
4. A comparative statement analysis indicates change in amount as well as change in percentage.
5. A positive change in amount and percentage indicates an increase and a negative change in amount and percentage indicates a decrease.
6. If the value in the first year is zero, then change in percentage cannot be indicated. This is the limitation of comparative statement analysis. While interpreting the results, qualitative inferences need to be drawn.
7. It is a popular tool useful for analysis by the financial analysts.
8. A comparative statement analysis cannot be used to compare more than two year's financial data.

In order to follow the planned course of actions, it is necessary to review the performances at short intervals such as, on a weekly, fortnightly, and monthly basis.

### Example

Following information is extracted from the books of XYZ Restaurant for the months of April and May 2007. You are required to prepare a comparative statement and comment thereon.

<i>Information for the month of</i>	<i>Apr. ' 07</i>	<i>May ' 07</i>
Opening Stock	27,000	24,000
Purchases	67,000	71,000

*Contd.*

Sales	1,43,000	1,57,000
Purchase Returns	1000	2000
Sales Returns	2000	3000
Payroll and Related expenses	15,000	18,000
Maintenance	3000	3600
Administrative expenses	6000	9000
Rates and Taxes	4800	4800
Depreciation	3300	3200
Staff Welfare Expenses	1200	1500
Closing Stock	24,000	21,000

**Solution:****Comparative Statement of XYZ Restaurant**

<i>Particulars</i>	<i>Apr. ' 07</i>			<i>May ' 07</i>			<i>Diff. in</i>
	<i>Amt.</i>	<i>Amt.</i>	<i>%</i>	<i>Amt.</i>	<i>Amt.</i>	<i>%</i>	<i>%</i>
<b>Sales</b>	1,43,000			1,57,000			
<i>Less:</i> Sales Returns	2000	1,41,000		3000	1,54,000	100	
<i>Less:</i> Food Cost (Variable Cost) Opening Stock	27,000			24,000			
<i>Add:</i> Purchases	67,000 <b>94,000</b>			71,000 <b>95,000</b>			
<i>Less:</i> Purchases Returns	1000 <b>93,000</b>			2000 <b>93,000</b>			
<i>Less:</i> Closing stock	24,000	69,000	49	21,000	72,000	47	-2
<b>Gross Profit</b>		<b>72,000</b>	<b>51</b>		<b>82,000</b>	<b>53</b>	<b>+2</b>
<i>Less:</i> Semi-variable Cost Overheads and Labour Cost Administrative expenses Payroll and Related expenses Staff Welfare expenses	6100 15,000 12,000	22,200 49,800	16 35	9000 18,000 1500	28,500 53,500	19 34	+3 -1
<i>Less:</i> Fixed Cost Rates and Taxes Depreciation Maintenance	4800 3300 3000	11,100	8	4800 3200 3600	11,600	8	-
<b>Net Profit</b>		<b>38,700</b>	<b>27</b>		<b>41,900</b>	<b>27</b>	-

### Comments

1. Sales have increased by ₹ 13,000 (₹ 1,54,000 – ₹ 1,41,000) over the previous month of April 2007.
2. Food cost has decreased by 2% resulting in increase in gross profit, which is due to increased sales in May 2007. Increased purchase cost is observed by increasing sales in May 2007.
3. Semi-variable cost has increased by 2%.
4. Fixed cost has almost remained unchanged.
5. No change in net profit, even with increases in semi-variable cost.

### Suggestions

Attempts to further increase sales should continue along with controlled/reduced purchase and semi-variable costs.

Accounting statement for a particular period forms the basis for comparison with the future performance results and is a guideline by itself for future performance. When these financial statements of performances are measured with the help of ratios and percentages compared with one another, they reveal to which extent the performances are consistent with planned performances, enabling the management to take timely actions.

## COMMON SIZE FINANCIAL STATEMENTS

Common size ratios are used to compare the financial statements of different size of companies or of the same company over different periods. By expressing the items in proportion to some size-related measure, standardized financial statements can be created, revealing trends and providing insight into how the different companies compare.

The common size ratio for each line on the financial statement is calculated as follows:

$$\text{Common Size Ratio} = \frac{\text{Item of Interest}}{\text{Reference Item}}$$

For example, if the item of interest is inventory and it is referenced to total assets (as it normally would be), the common size ratio would be:

$$\text{Common Size Ratio for Inventory} = \frac{\text{Inventory}}{\text{Total Assets}}$$

The ratios often are expressed as percentages of the reference amount. Common size statements usually are prepared for the income statement and balance sheet, expressing information as follows:

- Income statement items—expressed as a percentage of total revenue
- Balance sheet items—expressed as a percentage of total assets

The following example of income statement shows both the rupee amounts and the common size ratios:



**Common Size Income Statement**

	<i>Income Statement</i>	<i>Common-size Income Statement</i>
Revenue	70,134	100%
Cost of Goods Sold	44,221	63.1%
Gross Profit	25,913	36.9%
SG&A Expense	13,531	19.3%
Operating Income	12,382	17.7%
Interest Expense	2862	4.1%
Provision for Taxes	3766	5.4%
Net Income	5754	8.2%

For the balance sheet, the common size percentages are referenced to the total assets. The following sample balance sheet shows both the dollar amounts and the common size ratios:

**Common Size Balance Sheet**

	<i>Balance Sheet</i>	<i>Common-size Balance Sheet</i>
<b>Assets</b>		
Cash and Marketable Securities	6029	15.1%
Accounts Receivable	14,378	36.0%
Inventory	17,136	42.9%
<b>Total Current Assets</b>	<b>37,543</b>	<b>93.9%</b>
Property, Plant, and Equipment	2442	6.1%
<b>Total Assets</b>	<b>39,985</b>	<b>100%</b>
<b>Liabilities and Shareholders' Equity</b>		
Current Liabilities	14,251	35.6%
Long-Term Debt	12,624	31.6%
<b>Total Liabilities</b>	<b>26,875</b>	<b>67.2%</b>
Shareholders' Equity	13,110	32.8%
<b>Total Liabilities and Equity</b>	<b>39,985</b>	<b>100%</b>

The above common size statements are prepared in a vertical analysis, referencing each line on the financial statement to a total value on the statement in a given period.

The ratios in common size statements tend to have less variation than the absolute values themselves, and trends in the ratios can reveal important changes in the business. Historical comparisons can be made in a time-series analysis to identify such trends.

Common size statements also can be used to compare the firm to other firms.

### **Comparisons between Companies (Cross-Sectional Analysis)**

Common size financial statements can be used to compare multiple companies at the same point in time. A common-size analysis is especially useful when comparing companies of different sizes. It is often insightful to compare a firm to the best performing firm in its industry (benchmarking). A firm can also be compared to its industry as a whole. To compare to the industry, the ratios are calculated for each firm in the industry and an average for the industry is calculated. Comparative statements then may be constructed with the company of interest in one column and the industry averages in another. The result is a quick overview of where the firm stands in the industry with respect to key items on the financial statements.

### **Features of Common Size Statement**

1. A common size statement analysis indicates the relation of each component to the whole.
2. In the case of a common size income statement analysis, net sales is taken as 100% and in the case of common size balance sheet analysis, total funds available/total capital employed is considered as 100%.
3. It is used for vertical financial analysis and comparison of two business enterprises or two year's financial data.
4. Absolute figures from the financial statement are difficult to compare, but when converted and expressed as a percentage of net sales in the case of income statement and in the case of balance sheet as a percentage of total net assets or total funds employed, it becomes, more meaningful to relate.
5. A common size analysis is a type of ratio analysis where in the case of income statement sales is the denominator (base) and in the case of balance sheet funds employed or total net assets is the denominator (base) and all items are expressed as a relation to it.
6. In the case of common size statement analysis, the absolute figures are converted to proportions for the purpose of inter-firm as well as intra-firm analysis.

### **Limitations of Common Size Statement**

As with financial statements in general, the interpretation of common size statements is subject to many of the limitations in the accounting data used to construct them. For example:

1. Different accounting policies may be used by different firms or within the same firm at different points in time. Adjustments should be made for such differences.
2. Different firms may use different accounting calendars, so the accounting periods may not be directly comparable.

**ILLUSTRATIONS**

1. Calculate current ratio from the following information:

Stock	50,000	Cash	30,000
Debtors	40,000	Creditors	60,000
Bills Receivable	10,000	Bills Payable	40,000
Advance Tax	4000	Bank Overdraft	4000

**Solution:**

$$\text{Current Assets} = ₹ 50,000 + ₹ 40,000 + ₹ 10,000 + ₹ 4000 + ₹ 30,000 = ₹ 1,34,000$$

$$\text{Current Liabilities} = ₹ 60,000 + ₹ 40,000 + ₹ 4000 = ₹ 1,04,000$$

$$\text{Current Ratio} = ₹ 1,34,000 : ₹ 1,04,000 = 1.29:1.$$

2. Calculate quick ratio from the information given in Illustration 1.

**Solution:**

$$\text{Quick Assets} = \text{Current Assets} - \text{Stock} - \text{Advance Tax}$$

$$\text{Quick Assets} = ₹ 1,34,000 - (₹ 50,000 + ₹ 4000) = ₹ 80,000$$

$$\text{Current Liabilities} = ₹ 1,04,000$$

$$\text{Quick ratio} = \text{Quick Assets} : \text{Current Liabilities}$$

$$= ₹ 80,000 : ₹ 1,04,000$$

$$= 1:77$$

3. Calculate liquid ratio from the following information:

$$\text{Current Liabilities} \quad ₹ 50,000$$

$$\text{Current Assets} \quad ₹ 80,000$$

$$\text{Stock} \quad ₹ 25,000$$

$$\text{Prepaid Expenses} \quad ₹ 5000$$

**Solution:**

$$\text{Liquid Assets} = \text{Current Assets} - \text{Closing Stock} - \text{Prepaid Expenses}$$

$$= ₹ 80,000 - ₹ 25,000 - ₹ 5000 = ₹ 50,000$$

$$\text{Liquidity Ratio} = \text{Liquid Assets} : \text{Current Liabilities}$$

$$= ₹ 50,000 : ₹ 50,000 = 1:1.$$

4. X Ltd. has a current ratio of 3.5:1 and quick ratio of 2:1. If the excess of current assets over quick assets represented by stock is ₹ 24,000, calculate current assets and current liabilities.

**Solution:**

$$\text{Current Ratio} = 3.5:1$$

$$\text{Quick Ratio} = 2:1$$

$$\text{Let current liabilities} = x$$

$$\begin{aligned}
 \text{Current Assets} &= 3.5x \\
 \text{And Quick Assets} &= 2x \\
 \text{Stock} &= \text{Current Assets} - \text{Quick Assets} \\
 24,000 &= 3.5x - 2x \\
 24,000 &= 1.5x \\
 x &= ₹ 16,000 \\
 \text{Current Assets} &= 3.5x = 3.5 \times ₹ 16,000 = ₹ 56,000.
 \end{aligned}$$

**Verification:**

$$\begin{aligned}
 \text{Current Ratio} &= \text{Current Assets} : \text{Current Liabilities} \\
 &= ₹ 56,000 : ₹ 16,000 \\
 &= 3.5:1 \\
 \text{Quick Ratio} &= \text{Quick Assets} - \text{Current Liabilities} \\
 &= ₹ 32,000 : ₹ 16,000 \\
 &= 2:1
 \end{aligned}$$

5. Calculate the current ratio from the following information:

Total Assets	₹ 3,00,000	Fixed Assets	₹ 1,60,000
Long-term Liabilities	₹ 80,000	Investments	₹ 1,00,000
Shareholder's Fund	₹ 2,00,000	Fictitious Assets:	Nil

**Solution:**

$$\begin{aligned}
 \text{Total Assets} &= \text{Fixed Assets} + \text{Investments} + \text{Current Assets} \\
 ₹ 3,00,000 &= ₹ 1,60,000 + ₹ 1,00,000 + \text{Current Assets} \\
 \text{Current Assets} &= ₹ 3,00,000 - ₹ 2,60,000 = ₹ 40,000 \\
 \text{Total Assets} &= \text{Total Liabilities (including capital)} \\
 &= \text{Shareholders Funds} + \text{Long-term Liabilities} + \text{Current Liabilities} \\
 ₹ 3,00,000 &= ₹ 2,00,000 + ₹ 80,000 + \text{Current Liabilities} \\
 \text{Current Liabilities} &= ₹ 3,00,000 - ₹ 2,80,000 = ₹ 20,000 \\
 \text{Current Ratio} &= \text{Current Assets} : \text{Current Liabilities} \\
 &= ₹ 40,000 : ₹ 20,000 = 2:1.
 \end{aligned}$$

6. Calculate current assets of a company from the following information:

$$\begin{aligned}
 \text{Stock turnover ratio} &= 4 \text{ times} \\
 \text{Stock at the end is ₹ 20,000 more than the stock in the beginning.} \\
 \text{Sales ₹ 3,00,000 and gross profit ratio is 20\% of sales.} \\
 \text{Current liabilities} &= ₹ 40,000 \\
 \text{Quick ratio} &= 0.75
 \end{aligned}$$

**Solution:**

$$\begin{aligned}
 \text{Cost of Goods Sold} &= \text{Sales} - \text{gross profit} \\
 &= ₹ 3,00,000 - (₹ 3,00,000 \times 20\%) \\
 &= ₹ 3,00,000 - ₹ 60,000 \\
 &= ₹ 2,40,000 \\
 \text{Stock Turnover Ratio} &= \text{Cost of Goods Sold/Average stock} \\
 &= \text{Cost of Goods Sold/Average stock} \\
 \text{Average Stock} &= \text{Cost of Goods Sold}/4 \\
 &= ₹ 2,40,000/4 = ₹ 60,000 \\
 \text{Average Stock} &= (\text{Opening stock} + \text{Closing stock})/2 \\
 ₹ 60,000 &= (\text{Opening stock} + \text{Opening stock} + ₹ 20,000)/2 \\
 ₹ 60,000 &= \text{Opening stock} + ₹ 10,000 \\
 \text{Opening Stock} &= ₹ 50,000 \\
 \text{Closing Stock} &= ₹ 70,000 \\
 \text{Liquid Ratio} &= \text{Liquid assets/current liabilities} \\
 &= \text{Liquid assets}/₹ 40,000 \\
 \text{Liquid Assets} &= ₹ 40,000 \times 0.75 = ₹ 30,000 \\
 \text{Current Assets} &= \text{Liquid assets} + \text{Closing stock} \\
 &= ₹ 30,000 + ₹ 70,000 = ₹ 1,00,000.
 \end{aligned}$$

7. Calculate debt equity ratio from the following information:

Total external liabilities	₹ 5,00,000	Balance Sheet Total	₹ 10,10,000
Current liabilities	₹ 1,00,000	Fictitious Assets	₹ 10,000

**Solution:**

$$\begin{aligned}
 \text{Long-term Debt} &= \text{Total External Liabilities} - \text{Current Liabilities} \\
 &= ₹ 5,00,000 - ₹ 1,00,000 = ₹ 4,00,000 \\
 \text{Total Non-fictitious Assets} &= \text{Total Assets} - \text{Fictitious Assets} \\
 &= ₹ 10,10,000 - ₹ 10,000 = ₹ 10,00,000 \\
 \text{Shareholders Funds} &= \text{Non-fictitious Total Assets} - \text{Total liabilities} \\
 &= ₹ 10,00,000 - ₹ 5,00,000 = ₹ 5,00,000 \\
 \text{Debt Equity Ratio} &= ₹ 4,00,000/₹ 5,00,000 = 4:5
 \end{aligned}$$

8. From the following balance sheet of Lemon Tree Hotel, calculate debt equity ratio:

<i>Liabilities</i>	<i>Amount</i>	<i>Assets</i>	<i>Amount</i>
Preference Share Capital	2,00,000	Plant and Machinery	5,00,000
Equity Share Capital	8,00,000	Land and Building	4,00,000

*Contd.*

Reserves	1,10,000	Motor Car	1,50,000
Debentures	1,50,000	Furniture	50,000
Current Liabilities	1,40,000	Stock	1,00,000
		Debtors	90,000
		Cash & Bank	1,00,000
		Discount on Issue of Shares	10,000
<b>Total</b>	<b>14,00,000</b>	<b>Total</b>	<b>14,00,000</b>

**Solution:**

For the proper understanding of these ratios, the balance sheet is reframed in vertical format below.

**Balance Sheet****Sources of Funds:****Shareholders' Funds:**

Preference Share Capital	₹ 2,00,000	
Equity Share Capital	₹ 8,00,000	
Reserves	₹ 1,10,000	
Discount on Issue of Shares	<u>₹ (10,000)</u>	₹ 11,00,000
Long-term debt		
Debentures	<u>₹ 1,50,000</u>	<u>₹ 1,50,000</u>
		₹ 12,50,000

**Capital Employed****Application of funds:****Fixed Assets:**

Plant and Machinery	₹ 5,00,000
Land and Building	₹ 4,00,000
Motor Car	₹ 1,50,000
Furniture	<u>₹ 50,000</u>

**Total Fixed Assets:** ₹ 11,00,000

**Current Assets:**

Stock	₹ 1,00,000
Debtors	₹ 90,000
Cash and Bank	₹ 1,00,000

**Total Current assets** ₹ 2,90,000

*Less:* Current Liabilities: ₹ 1,40,000

Net Current Assets ₹ 1,50,000

**Total Application of funds (Net Assets)** ₹ 12,50,000

Debt equity ratio	= Long-term debt/Equity
Debt ratio	= Long-term debt/Capital employed
Proprietary ratio	= Shareholders' funds/Capital employed
Debt/Equity ratio	= ₹ 1,50,000/₹ 11,00,000 = 0.136
Debt to total funds ratio	= ₹ 1,50,000/₹ 12,50,000 = 0.12
Proprietary ratio	= ₹ 11,00,000/₹ 12,50,000 = 0.88

In case the debt ratio and proprietary ratio are based on total assets (₹ 13,90,000), these shall work out as follows:

Debt ratio	= Total debt/Total assets
	= ₹ 2,90,000/₹ 13,90,000 = 0.209
Proprietary ratio	= Shareholders funds/Total assets
	= ₹ 11,00,000/₹ 13,90,000 = 0.791

9. From the following information, calculate Debt Equity Ratio, Debt Ratio, Proprietary Ratio and Ratio of Total Assets to Debt:

<i>Liabilities</i>	<i>Amount</i>	<i>Assets</i>	<i>Amount</i>
Preference Share Capital	1,00,000	Fixed Assets	4,00,000
Equity Share Capital	3,00,000	Investments	1,00,000
Reserves	1,10,000	Current Assets	2,00,000
Secured Loans	1,50,000	Preliminary Expenses	10,000
Current Liabilities	50,000		
<b>Total</b>	<b>7,10,000</b>	<b>Total</b>	<b>7,10,000</b>

***Solution:***

Total Assets	= Fixed Assets + Investment + Current Assets
	= ₹ 4,00,000 + ₹ 1,00,000 + ₹ 2,00,000
	= ₹ 7,00,000
Net Assets	= Total Non-fictitious Assets – Current Liabilities
	= ₹ 7,00,000 – ₹ 50,000 = ₹ 6,50,000
Shareholders' Funds	= Preference Shares + Equity Shares + Reserves and Surplus
	– Expenses Preliminary
	= ₹ 1,00,000 + ₹ 3,00,000 + ₹ 1,10,000 – ₹ 10,000
	= ₹ 5,00,000
Debt equity ratio	= ₹ 1,50,000/₹ 5,00,000 = 0.3
Debt ratio	= ₹ 1,50,000/₹ 6,50,000 = 0.23
Long-term debt	= ₹ 1,50,000

$$\begin{aligned}\text{Proprietary ratio} &= ₹ 5,00,000/₹ 6,50,000 = 0.77\% \\ \text{Total assets to Debt ratio} &= ₹ 7,00,000/₹ 1,50,000 = 4.67\% \\ &= 1.25.\end{aligned}$$

10. From the following details, calculate interest coverage ratio:

Net Profit after tax ₹ 60,000; 15% Long-term Debt 10,00,000; and Tax Rate 40%.

**Solution:**

$$\begin{aligned}\text{Net Profit after Tax} &= ₹ 60,000 \\ \text{Tax Rate} &= 40\% \\ \text{Net Profit before tax} &= \text{Net profit after tax} \times 100 / (100 - \text{Tax rate}) \\ &= ₹ 60,000 \times 100 / (100 - 40) \\ &= ₹ 1,00,000 \\ \text{Interest on Long Term Debt} &= 15\% \text{ of } ₹ 10,00,000 = ₹ 1,50,000 \\ \text{Net profit before interest and tax} &= \text{Net profit before tax} + \text{Interest} \\ &= ₹ 1,00,000 + ₹ 1,50,000 = ₹ 2,50,000 \\ \text{Interest Coverage Ratio} &= \text{Net Profit before Interest and} \\ \text{Tax/Interest on long-term debt} &= ₹ 2,50,000/₹ 1,50,000 \\ &= 1.67 \text{ times.}\end{aligned}$$

11. From the following information, calculate stock turnover ratio:

Opening Stock	₹ 18,000	Wages	₹ 14,000
Closing Stock	₹ 22,000	Sales	₹ 80,000
Purchases	₹ 46,000	Carriage Inwards	₹ 4000

**Solution:**

$$\begin{aligned}\text{Stock Turnover Ratio} &= \text{Cost of Goods Sold} / \text{Average Stock} \\ \text{Cost of Goods Sold} &= \text{Opening Stock} + \text{Purchases} - \text{Closing Stock} + \text{Direct Expenses} \\ &= ₹ 18,000 + ₹ 46,000 - ₹ 22,000 + (₹ 14,000 + ₹ 4000) \\ &= ₹ 60,000 \\ \text{Average Stock} &= (\text{Opening Stock} + \text{Closing Stock}) / 2 \\ &= (₹ 18,000 + ₹ 22,000) / 2 = ₹ 20,000 \\ \text{Stock Turnover Ratio} &= ₹ 60,000 / ₹ 20,000 \\ &= 3 \text{ Times.}\end{aligned}$$

12. From the following information, calculate stock turnover ratio. Sales: ₹ 4,00,000, Average Stock: ₹ 55,000, Gross Loss Ratio: 10%.

**Solution:**

$$\begin{aligned}\text{Sales} &= ₹ 4,00,000 \\ \text{Gross Loss} &= 10\% \text{ of } ₹ 4,00,000 = ₹ 40,000\end{aligned}$$



$$\begin{aligned}\text{Cost of goods Sold} &= \text{Sales} + \text{Gross Loss} \\ &= ₹ 4,00,000 + ₹ 40,000 = ₹ 4,40,000\end{aligned}$$

$$\begin{aligned}\text{Stock Turnover Ratio} &= \text{Cost of Goods Sold}/\text{Average Stock} \\ &= ₹ 4,40,000/₹ 55,000 = 8 \text{ times.}\end{aligned}$$

13. A trader carries an average stock of ₹ 40,000. His stock turnover is 8 times. If he sells goods at a profit of 20% on sales, find out the profit.

**Solution:**

$$\begin{aligned}\text{Stock Turnover Ratio} &= \text{Cost of Goods Sold}/\text{Average Stock} \\ &= \text{Cost of Goods Sold}/₹ 40,000\end{aligned}$$

$$\begin{aligned}\text{Cost of Goods Sold} &= ₹ 40,000 \times 8 \\ &= ₹ 3,20,000\end{aligned}$$

$$\begin{aligned}\text{Sales} &= \text{Cost of Goods Sold} \times 100/80 \\ &= ₹ 3,20,000 \times 100/80 \\ &= ₹ 4,00,000\end{aligned}$$

$$\begin{aligned}\text{Gross Profit} &= \text{Sales} - \text{Cost of Goods Sold} \\ &= ₹ 4,00,000 - ₹ 3,20,000 \\ &= ₹ 80,000.\end{aligned}$$

14. Calculate the debtors turnover ratio from the following information:

$$\begin{aligned}\text{Total sales} &= ₹ 4,00,000 \\ \text{Cash sales} &= 20\% \text{ of total sales} \\ \text{Debtors on 1.1.2004} &= ₹ 40,000 \\ \text{Debtors on 31.12.2004} &= ₹ 1,20,000\end{aligned}$$

**Solution:**

$$\text{Average Debtors} = (\text{₹ } 40,000 + \text{₹ } 1,20,000)/2 = ₹ 80,000$$

$$\begin{aligned}\text{Net credit sales} &= \text{Total sales} - \text{Cash sales} \\ &= ₹ 4,00,000 - ₹ 80,000 \text{ (20\% of ₹ } 4,00,000) \\ &= ₹ 3,20,000\end{aligned}$$

$$\begin{aligned}\text{Debtors Turnover Ratio} &= \text{Net Credit sales}/\text{Average Accounts receivable} \\ \text{Average Debtors} &= ₹ 3,20,000/₹ 80,000 \\ &= 4 \text{ times.}\end{aligned}$$

15. Calculate the Creditor's Turnover Ratio from the following figures:

$$\begin{aligned}\text{Credit purchases during 2005} &= ₹ 12,00,000 \\ \text{Creditors + Bills Payables on 1.1.2005} &= ₹ 4,00,000 \\ \text{Creditors + Bills Payables on 31.12.2005} &= ₹ 2,00,000\end{aligned}$$

**Solution:**

$$\begin{aligned}\text{Average Creditors} &= (\text{₹ } 4,00,000 + \text{₹ } 2,00,000)/2 \\ &= ₹ 3,00,000\end{aligned}$$

$$\begin{aligned}\text{Debtors Turnover Ratio} &= \text{Net Credit Sales/Average Debtors} \\ \text{Average accounts payable} &= ₹ 12,00,000/₹ 3,00,000 \\ &= 4 \text{ times.}\end{aligned}$$

16. From the following information, calculate:

- (i) Debtors Turnover Ratio
- (ii) Average Collection Period
- (iii) Payable Turnover Ratio
- (iv) Average Payment Period

*Given:*

Sales	8,75,000	Creditors	90,000
Bills Receivable	48,000	Bills Payable	52,000
Purchases	4,20,000	Debtors	59,000 <sup>#</sup>

**Solution:**

$$\begin{aligned}\text{(i) Debtors Turnover Ratio} &= \frac{₹ 8,75,000}{₹ 59,000 + ₹ 48,000} \\ &= 8.18 \text{ times}\end{aligned}$$

<sup>#</sup>This figure has not been divided by 2, in order to calculate an average, as the figures of debtors and bills receivables in the beginning of the year are not available. So when only year-end figures are available, use the same as it is.

$$\text{(ii) Average Collection Period} = 365$$

$$\begin{aligned}\text{Debtors Turn over Ratio} &= \frac{365}{8.18} \\ &= 45 \text{ days}\end{aligned}$$

$$\begin{aligned}\text{(iii) Payable Turnover Ratio} &= \frac{\text{Purchases}}{\text{Average Creditors}} \\ &= \frac{\text{Purchases}}{\text{Creditors} + \text{Bills Payable}} \\ &= \frac{4,20,000}{90,000 + 52,000} \\ &= \frac{4,20,000}{1,42,000} \\ &= 3 \text{ times}\end{aligned}$$

$$\begin{aligned}\text{(iv) Average Payment Period} &= \frac{365}{\text{Payables Turnover Ratio}} \\ &= \frac{365}{3} \\ &= 122 \text{ days}\end{aligned}$$

17. From the following information, calculate (i) Net Assets Turnover, (ii) Fixed Assets Turnover, and (iii) Working Capital Turnover Ratios:

<i>Liabilities</i>	<i>Amount (₹)</i>	<i>Assets</i>	<i>Amount (₹)</i>
Preference Share Capital	4,00,000	Plant and Machinery	8,00,000
Equity Share Capital	6,00,000	Land and Building	5,00,000
General Reserve	1,00,000	Motor Car	2,00,000
Profit and Loss Account	3,00,000	Furniture	1,00,000
15% Debentures	2,00,000	Stock	1,80,000
14% Debentures	2,00,000	Debtors	1,10,000
Creditors	1,40,000	Bank	80,000
Bills payable	50,000	Cash	30,000
Outstanding Expenses	10,000		
<b>Total</b>	<b>20,00,000</b>	<b>Total</b>	<b>20,00,000</b>

Sales for the year 2005 were ₹ 30,00,000.

**Solution:**

$$\begin{aligned}
 \text{Sales} &= ₹ 30,00,000 \\
 \text{Capital Employed} &= \text{Share Capital} + \text{Reserves and Surplus} + \text{Long-term Debt} \\
 &\quad \text{(or Net Assets)} \\
 &= (₹ 4,00,000 + ₹ 6,00,000) + (₹ 1,00,000 + ₹ 3,00,000) \\
 &\quad + (₹ 2,00,000 + ₹ 2,00,000) \\
 &= ₹ 18,00,000 \\
 \text{Fixed Assets} &= ₹ 8,00,000 + ₹ 5,00,000 + ₹ 2,00,000 + ₹ 1,00,000 \\
 &= ₹ 16,00,000 \\
 \text{Working Capital} &= \text{Current Assets} - \text{Current Liabilities} \\
 &= ₹ 4,00,000 - ₹ 2,00,000 = ₹ 2,00,000 \\
 \text{Net Assets Turnover Ratio} &= ₹ 30,00,000 / ₹ 18,00,000 = 1.67 \text{ times} \\
 \text{Fixed Assets Turnover Ratio} &= ₹ 30,00,000 / ₹ 16,00,000 = 1.88 \text{ times} \\
 \text{Working Capital Turnover} &= ₹ 30,00,000 / ₹ 2,00,000 = 15 \text{ times}
 \end{aligned}$$

18. Following information is available for the year 2005. Calculate gross profit ratio.

	₹
Cash Sales	25,000
Credit	75,000
Purchases: Cash	15,000

Credit	60,000
Carriage Inwards	2000
Salaries	25,000
Decrease in Stock	10,000
Return Outwards	2000
Wages	5000

**Solution:**

$$\begin{aligned}
 \text{Sales} &= \text{Cash Sales} + \text{Credit Sales} \\
 &= ₹ 25,000 + ₹ 75,000 = ₹ 1,00,000 \\
 \text{Net Purchases} &= \text{Cash Purchases} + \text{Credit Purchases} - \text{Return Outwards} \\
 &= ₹ 15,000 + ₹ 60,000 - ₹ 2000 = ₹ 73,000 \\
 \text{Cost of Sales} &= \text{Purchases} + (\text{Opening Stock} - \text{Closing Stock}) + \text{Direct Expenses} \\
 \text{Direct Expenses} &= \text{Purchases} + \text{Decrease in stock} + \text{Direct Expenses} \\
 &= ₹ 73,000 + ₹ 10,000 + (₹ 2000 + ₹ 5000) \\
 &= ₹ 90,000 \\
 \text{Gross Profit} &= \text{Sales} - \text{Cost of Sales} = ₹ 1,00,000 - ₹ 90,000 \\
 &= ₹ 10,000 \\
 \text{Gross Profit Ratio} &= \text{Gross Profit} / \text{Net Sales} \times 100 \\
 &= ₹ 10,000 / ₹ 1,00,000 \times 100 \\
 &= 10\%.
 \end{aligned}$$

19. The following information is given below:

	₹
Sales	3,40,000
Cost of Goods Sold	1,20,000
Selling expenses	80,000
Administrative Expenses	40,000

Calculate gross profit ratio and operating ratio.

**Solution:**

$$\begin{aligned}
 \text{Gross Profit} &= \text{Sales} - \text{Cost of goods sold} \\
 &= ₹ 3,40,000 - ₹ 1,20,000 \\
 &= ₹ 2,20,000
 \end{aligned}$$

$$\begin{aligned}
 \text{Gross Profit Ratio} &= \frac{\text{Gross Profit}}{\text{Sales}} \times 100 \\
 &= \frac{₹ 2,20,000}{₹ 3,40,000} \times 100 \\
 &= 64.71\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Operating Expenses} &= \text{Cost of goods sold} + \text{Selling Expenses} + \text{Administrative Expenses} \\
 &= ₹ 1,20,000 + 80,000 + 40,000 \\
 &= ₹ 2,40,000
 \end{aligned}$$

$$\begin{aligned}
 \text{Operating Ratio} &= \frac{\text{Operating Expenses}}{\text{Net Sales}} \times 100 \\
 &= \frac{₹ 2,40,000}{₹ 3,40,000} \times 100 \\
 &= 70.58\%
 \end{aligned}$$

20. Gross profit ratio of a company was 25%. Its credit sales was ₹ 20,00,000 and its cash sales was 10% of the total sales. If the indirect expenses of the company were ₹ 50,000, calculate its net profit ratio.

**Solution:**

$$\begin{aligned}
 \text{Cash sales} &= ₹ 20,00,000 \times 10/90 \\
 &= ₹ 2,22,222
 \end{aligned}$$

$$\text{Hence, total sales are} = ₹ 22,22,222.$$

$$\text{Gross profit} = 0.25 \times 22,22,222 = ₹ 5,55,555$$

$$\begin{aligned}
 \text{Net profit} &= ₹ 5,55,555 - 50,000 \\
 &= ₹ 5,05,555
 \end{aligned}$$

$$\begin{aligned}
 \text{Net profit ratio} &= \text{Net profit/sales} \times 100 \\
 &= ₹ 5,05,555 / ₹ 22,22,222 \times 100 \\
 &= 22.75\%.
 \end{aligned}$$

21. From the following details, calculate Return on Investment:

	₹
Share Capital: Equity (₹ 10)	4,00,000
12% Preference	1,00,000
10% Debentures	4,00,000
General Reserve	1,89,000
Current Liabilities	1,00,000
Discount on shares	5000
Fixed Assets	9,50,000
Current Assets	2,34,000

Also calculate Return on Shareholder's Funds, EPS, Book value per share and P/E ratio if the market price of the share is ₹ 34 and the net profit after tax was ₹ 1,50,000, and the tax had amounted to ₹ 50,000.

**Solution:**

Profit before interest and tax	= ₹ 1,50,000 + Debenture interest + Tax = ₹ 1,50,000 + ₹ 40,000 + ₹ 50,000 = ₹ 2,40,000
Capital Employed	= Equity Share Capital + Preference Share Capital + Reserves + Debentures – Discount on Shares = ₹ 4,00,000 + ₹ 1,00,000 + ₹ 1,89,000 + ₹ 4,00,000 – ₹ 5000 = ₹ 10,84,000
Return on Investment	= Profit before Interest and Tax/Capital Employed × 100 = ₹ 2,40,000/₹ 10,84,000 × 100 = 22.14%
Return on Shareholders	= Profit after Tax/Shareholder's Fund Fund × 100 = ₹ 1,50,000/₹ 6,84,000 × 100 = 13.84%
EPS	= Profit available for equity shareholders/No. of Equity Shares = ₹ 1,38,000/40,000 = ₹ 3.45
Profit available to equity	= Profit after Tax – Preference Dividend shareholders = ₹ 1,50,000 – ₹ 12,000 = ₹ 1,38,000
P/E Ratio	= Market price of a share/Earnings per share = 34/3.45 = 9.86 times
Book Value per share	= Equity Shareholders' funds/No. of Equity Shares
Hence, Book value per share	= ₹ 5,84,000/40,000 shares = ₹ 14.6

22. From the following Balance Sheets of JW Marriot and Income Statement for the year 2008, calculate ratios testing the company's liquidity, solvency and profitability. Also compute earnings per share and price earning ratios. Also calculate ratios testing capital gearing.

**Balance Sheet**

<i>Liabilities</i>	<i>2008</i>	<i>2007</i>	<i>Assets</i>	<i>2008</i>	<i>2007</i>
Current Liabilities:			Current Assets:		
Accounts payable	30,000	25,000	Cash	30,000	30,000
Accrued Wages and Taxes	10,000	10,000	Accounts Receivable	40,000	30,000
Estimated income tax payable	20,000	15,000	Less: Allowance for bad debts (₹ 2000 for 2008 and ₹ 2000 for 2007)	60,000	50,000

Contd.

Fixed liabilities:			Merchandise Inventory	10,000	10,000
Mortgage Bonds 4%	40,000	40,000	Fixed Assets		
Stockholder's Equity			Land	30,000	30,000
Common Stock (5000 shares outstanding) (Market price ₹ 30)	60,000	60,000	Building & Equipment 2008—1,20,000 2007—1,20,000		
Retained Earnings	70,000	60,000	Less: Accumulated Depreciation 2008—70,000 2007—60,000	50,000	60,000
			Other Assets		—
			Goodwill and Patents	10,000	
	2,30,000	2,10,000		2,30,000	2,10,000

## Income Statement for the year 2008

	₹	Percentage
Gross Sales	3,03,000	
Less: Returns and allowances	3000	
Net Sales	3,00,000	100
Less: Cost of Goods Sold	1,80,000	60
Gross Profit	1,20,000	40
Operating Expenses	78,000	26
Operating Profit	42,000	14
Interest	2000	0.70
Income before Taxes	40,000	13.30
Provision for Income tax	20,000	6.70
Net Income	20,000	6.60

**Solution:****I. Test of Liquidity**

$$\begin{aligned}
 1. \text{ Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\
 &= \frac{(30,000 + 40,000 + 60,000 + 10,000)}{(30,000 + 10,000 + 20,000)} \\
 &= \frac{1,40,000}{60,000} = 2.3:1 \quad \text{or} \quad 2.3 \text{ times}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Acid Test Ratio} &= \frac{\text{Quick Assets}}{\text{Quick Liabilities}} \\
 &= \frac{\text{Cash} + \text{Accounts Receivable}}{\text{Current Liabilities}} \\
 &= \frac{70,000}{60,000} = 1.2:1 \quad \text{or} \quad 1.2 \text{ times}
 \end{aligned}$$

## II. Tests of Solvency

$$\begin{aligned}
 1. \text{ Equity Ratio} &= \frac{\text{Stockholder's Equity}}{\text{Total Assets}} \\
 &= \frac{60,000 + 70,000}{2,30,000} = \frac{1,30,000}{2,30,000} \\
 &= 13:23 = 0.57
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Shareholder's Equity to Fixed Assets Ratio} &= \frac{\text{Shareholder's Equity}}{\text{Fixed Assets}} \\
 &= \frac{1,30,000}{80,000} \\
 &= 13:8 = 1.63
 \end{aligned}$$

### 3. Debt Service Coverage Ratio

$$\begin{aligned}
 &= \frac{\text{Operating Profit before Interest and Tax}}{\text{Interest on long term (Bonds, Debentures and Public Deposits)}} \\
 &= \frac{42,000}{1600} \\
 &= 26
 \end{aligned}$$

## III. Profitability Tests

$$\begin{aligned}
 1. \text{ Return on total assets} &= \frac{\text{Income before tax and interest}}{\text{Total Assets}} \times 100 \\
 &= \frac{42,000}{2,30,000} \times 100 \\
 &= 18.3\%
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Return on Total Investments} &= \frac{\text{Profit before tax}}{\text{Average Equity Capital} + \text{Average Fixed Liabilities}} \times 100 \\
 &= \frac{42,000}{1,25,000 + 40,000} \times 100 \\
 &= 25.5\%
 \end{aligned}$$



**Note:**

If comparative Balance Sheets are given, average should be taken for Equity Capital and Fixed Liabilities)

$$\begin{aligned}
 3. \text{ Return on Shareholder's Funds} &= \frac{\text{Net Income after tax}}{\text{Average Shareholder's Equity}} \times 100 \\
 &= \frac{20,000}{(1,20,000 + 1,30,000)/2} \\
 &= \frac{20,000}{1,25,000} \times 100 = 16\%
 \end{aligned}$$

$$\begin{aligned}
 4. \text{ Inventory Turnover Ratio} &= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \\
 &= \frac{1,80,000}{55,000} = 3.3 \text{ times}
 \end{aligned}$$

**IV. Other Ratios**

$$\begin{aligned}
 1. \text{ Earnings per share} &= \frac{\text{Net Income}}{\text{No. of Equity Shares}} \\
 &= \frac{20,000}{5000} = ₹ 4
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ Price Earning Ratio} &= \frac{\text{Average Market price per share}}{\text{Earnings per share}} \\
 &= \frac{30}{4} = 7.5:1
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ Capital Gearing Ratio} &= \frac{\text{Owner's Equity}}{\text{Fixed Interest bearing Securities}} \\
 &= \frac{60,000 + 70,000}{40,000} \\
 &= \frac{1,30,000}{40,000} \\
 &= 3.25 \text{ times}
 \end{aligned}$$

23. With the help of the following information prepare the Balance Sheet of The Pavilion Hotel:

	₹
Current Ratio	2.5
Liquidity Ratio	1.5
Net working capital	₹ 3,00,000
Stock Turnover Ratio	6
Rate of Gross Profit to Sales	20%
Turnover Ratio to Fixed Assets (net)	2 times
Average collection period	2 months
Fixed assets to net worth	0.80
Reserves and Surplus to Capital	0.50

**Solution:**

### Balance Sheet of the Pavilion Hotel

<i>Capital and Liabilities</i>	₹	<i>Assets</i>	₹
Capital	5,00,000	Fixed Assets	6,00,000
Reserves and Surplus	2,50,000	Current Assets:	
Long Term Loans (balancing figure)	1,50,000	Stock	2,00,000
Current Liabilities	2,00,000	Debtors	2,50,000
		Cash	50,000
	<b>11,00,000</b>		<b>11,00,000</b>

### Working Notes:

- (a) Current Assets are 2.5 times the current liabilities; if current liabilities are “1”, current assets are 2.5; the difference (working capital) is “1.5”. The net working capital is ₹ 3,00,000. Therefore total current assets are:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2.5 = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2.5 \text{ Current Liabilities} = \text{Current Assets}$$

$$\text{Net Working Capital} = \text{Current Asset} - \text{Current Liabilities}$$

$$\text{Net Working Capital} = 2.5 \text{ Current Liabilities} - \text{Current Liabilities}$$

$$3,00,000 = 1.5 \text{ Current Liabilities}$$

$$\begin{aligned}\text{Current Liabilities} &= \frac{3,00,000}{1.5} \\ \text{Current Liabilities} &= \mathbf{2,00,000} \\ \text{Current Assets} &= 2.5 \text{ Current Liabilities} \\ \text{Current Assets} &= 2.5 \times 2,00,000 \\ \text{Total Current Assets} &= \mathbf{5,00,000}\end{aligned}$$

$$(i) \text{ Liquidity Ratio} = \frac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities}}$$

$$1.5 = \frac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities}}$$

$$1.5 \text{ Current Liabilities} = \text{Current Assets} - \text{Stock}$$

$$1.5 \times 2,00,000 = 5,00,000 - \text{Stock}$$

$$\text{Stock} = 5,00,000 - 3,00,000$$

$$\text{Stock} = \mathbf{2,00,000}$$

$$(ii) \text{ Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}}$$

$$6 = \frac{\text{Cost of Goods Sold}}{2,00,000}$$

$$\text{Cost of Goods Sold} = 12,00,000$$

$$\text{Gross Profit} = 20\% \text{ to Sales or } 25\% \text{ on cost}$$

$$\text{Sales} = \frac{12,00,000 \times 100}{80}$$

$$\text{Sales} = \mathbf{15,00,000}$$

$$\text{Debtors} = \text{Sales} / 12 \times 2 = 15,00,000 / 12 \times 2 = \mathbf{2,50,000}$$

$$(iii) \text{ Cash} = \text{Current Assets} - \text{Stock} - \text{Debtors} = 5,00,000 - 2,00,000 - 2,50,000 = \mathbf{50,000}$$

(b) Stock Turnover Ratio being 6, the cost of sales will be ₹ 12,00,000. The fixed assets turnover ratio being 2, the fixed assets will be ₹ **6,00,000**

(c) Fixed assets are 80% of net worth; hence net worth is  
 $6,00,000 \times 100 / 80 = \mathbf{₹ 7,50,000}$

(d) Since Reserves and Surplus are 0.5 of capital, they are 1/3 of reserves plus capital (net worth).

Hence 1/3 of ₹ 7,50,000 will be reserves and the remaining amount of ₹ **5,00,000 capital**

$$\text{Reserves \& Surplus} = 5,00,000 \times 0.5 = \mathbf{2,50,000}$$

## Objective Type Questions

*State whether the following statements are true or false:*

- (a) Debt-equity ratio is a solvency ratio.
- (b) Rate of return on capital employed is a turnover ratio.
- (c) For stock turnover ratio, average stock is to be calculated.
- (d) Capital gearing is the ratio of debt to equity.
- (e) Acid test defines liquidity.

## Review Questions

1. What is a ratio?
2. What is ratio analysis?
3. What are the advantages and limitations of ratio analysis?
4. Write short notes on the following:
  - (i) Net worth
  - (ii) Retained earning
  - (iii) Net working capital
  - (iv) Profitability ratios
  - (v) Stock turnover
  - (vi) Return on shareholder's funds
  - (vii) Debt equity ratio
  - (viii) Return on capital employed.
5. What do you mean by property and equipment turnover ratio? What is their significance?
6. What is meant by the term ratio analysis in financial management? Classify the different types of ratios with examples.
7. Briefly explain the meaning and significance of the following ratios:
  - (i) Current ratio
  - (ii) Acid Test Ratio
  - (iii) Return on assets
  - (iv) Asset turnover ratio
  - (v) Return on owners equity
  - (vi) Price earning ratio
  - (vii) Property and equipment turnover ratio
  - (viii) Long-term debt to total capitalization.
8. Explain the significance of inventory turnover ratio.
9. What is meant by leverage ratios or capital structure ratios? Explain their utility.
10. What is meant by comparative statements? Discuss its features and uses.
11. What is meant by common size statement? Discuss its features and limitations.

### Exercises

1. Total Sales ₹ 5,00,000
- Total Purchases ₹ 3,75,000
- Cash Sales ₹ 50,000
- Cash Purchases ₹ 25,000

	1.1.02	1.1.03
Sundry Debtors	30,000	40,000
Sundry Creditors	28,000	34,000
Bills Receivable	5000	7000
Bills Payable	7000	10,000

Calculate:

(i) Debtors Turnover Ratio and (ii) Creditors Turnover Ratio.

2. Following are the Trading and Profit and Loss Account of Sun Hotel Ltd. for the year ended 31st December 2010 and the Balance Sheet as on that date:

#### Trading and Profit and Loss Account for the year ending 31st December 2010

<i>Particulars</i>	₹	<i>Particulars</i>	₹
To Opening Stock	1,45,000	By Sales	7,50,000
To Purchases	6,10,000	By Closing Stock	1,55,000
To Gross profit	1,50,000		
	<b>9,05,000</b>		<b>9,05,000</b>
To Sundry Expenses	80,000	By Gross Profit	1,50,000
To Net Profit	70,000		
	<b>1,50,000</b>		<b>1,50,000</b>

#### Balance Sheet as on 31st December 2010

<i>Capital and Liabilities</i>	₹	₹	<i>Assets</i>	₹
Share Capital		7,00,000	Net Fixed Assets	5,50,000
Reserves and Surplus	50,000		<b>Current Assets:</b>	
P&L Account	70,000	1,20,000	Stock	1,55,000
Bank Overdraft		35,000	Debtors	80,000
Creditors		1,50,000	Cash	2,20,000
		<b>10,50,000</b>		<b>10,50,000</b>

You are required to calculate the following ratios:

- (i) Current ratio
- (ii) Quick ratio
- (iii) Stock turnover ratio
- (iv) Debtors turnover ratio
- (v) Return on owner's equity

3. Calculate the following ratios from the given Balance Sheet

- (i) Current ratio
- (ii) Inventory turnover ratio
- (iii) Quick ratio
- (iv) Average collection period
- (v) Proprietor's fund to liabilities

<i>Liabilities</i>	<i>Amount</i>	<i>Assets</i>	<i>Amount</i>
Share Capital	2,00,000	Goodwill	1,20,000
Reserves and Surplus	58,000	Plant and Machinery	1,50,000
Debentures	1,00,000	Stock	80,000
Creditors	40,000	Debtors	45,000
Bills Payable	20,000	Cash	17,000
Other Current Liabilities	2000	Other Current Assets	8000
<b>Total</b>	<b>4,20,000</b>		<b>4,20,000</b>

4. The summarized Balance Sheet of Hotel Tamarind for the year ended 31.03.2006 is given below.

<i>Liabilities</i>	<i>Amount (₹)</i>	<i>Assets</i>	<i>Amount (₹)</i>
Equity share capital	1,40,00,000	Fixed Assets 2,10,00,000	
Reserves and Surplus	45,00,000	Less: Depreciation 25,00,000	1,85,00,000
Profit and Loss A/c	20,00,000	Current Assets:	
Provision for Taxation	10,00,000	Stock	25,00,000
Sundry Creditors	40,00,000	Debtors	30,00,000
		Cash	15,00,000
	<b>2,55,00,000</b>		<b>2,55,00,000</b>

The following further particulars are also given for the year:

	₹
Sales	1,20,00,000
Earnings before interest and tax (EBIT)	30,00,000
Net Profit after tax (PAT)	20,00,000

Calculate the following for the company:

- (i) Current ratio
- (ii) Liquidity ratio
- (iii) Debtors turnover ratio
- (iv) Stock turnover ratio
- (v) Profitability ratio
- (vi) Profitability on funds employed
- (vii) Average collection period
- (viii) Return on equity

5. The following information for the year ended 31st March 2002 is supplied to you:

<i>Liabilities</i>	<i>Amount (₹)</i>	<i>Assets</i>	<i>Amount (₹)</i>
Share Capital	2,00,000	Plant and Machinery	2,29,000
Reserves and Surplus	50,000	Closing Stock	80,000
Debentures	1,00,000	Sundry Debtors	70,000
Sundry Creditors	30,000	Bills receivable	20,000
Bills Payable	20,000	Prepaid Insurance	2000
Bank overdraft	25,000	Bank	24,000
	<b>4,25,000</b>		<b>4,25,000</b>

Sales ₹ 3,00,000

Calculate:

- (i) Current ratio
- (ii) Liquid ratio
- (iii) Debt equity ratio
- (iv) Debtors turnover ratio
- (v) Stock turnover ratio

6. The following is the Balance Sheet of Hotel Empire for the year ended 31st March 2004:

<i>Liabilities</i>	<i>Amount (₹)</i>	<i>Assets</i>	<i>Amount (₹)</i>
Share Capital	1,50,000	Fixed Assets	70,000
Reserves and Surplus	75,000	Closing Stock	1,20,000

*Contd.*

Debentures	20,000	Sundry Debtors	90,000
Sundry Creditors	45,000	Cash at bank	10,000
Bank overdraft	35,000	Cash in hand	35,000
	<b>3,25,000</b>		<b>3,25,000</b>

Sales ₹ 3,00,000

Calculate:

- (i) Current ratio
  - (ii) Liquid ratio
  - (iii) Debt equity ratio
  - (iv) Debtors turnover ratio
  - (v) Stock turnover ratio
  - (vi) Proprietary turnover ratio
7. Hot Pot Hotel's current assets and current liabilities from the past three years' balance sheet are as follows:

	2001	2002	2003
<b>Current Assets</b>	₹	₹	₹
Cash	15,000	10,000	8000
Marketable Securities	30,000	25,000	20,000
Accounts Receivables (Net)	70,000	85,000	95,000
Inventory-Food	20,000	22,000	25,000
Prepaid Expenses	10,000	12,000	15,000
<b>Total</b>	<b>1,45,000</b>	<b>1,54,000</b>	<b>1,63,000</b>
<b>Current Liabilities</b>			
Account Payable	60,000	62,000	65,000
Notes Payable	30,000	30,000	30,000
Wages Payable	20,000	22,000	25,000
Taxes Payable	10,000	11,000	12,000
<b>Total</b>	<b>1,20,000</b>	<b>1,25,000</b>	<b>1,32,000</b>
<b>Selected Operations Data:</b>			
Sales (Total)	10,00,000	11,00,000	12,00,000
Cost of Food Consumed	1,50,000	1,60,000	1,68,000
<b>Note:</b> Assume that 50% of the sales were on account			



You are required to compute the following:

- (i) Current ratio
- (ii) Acid-test ratio
- (iii) Accounts receivable turnover (2002 and 2003 only)
- (iv) Inventory turnover (2002 and 2003 only)

# 17

## Chapter

# Cash Flow Statement

### Learning Objectives

This chapter would help the reader to understand:

- Meaning of cash flow statement
- Objectives of cash flow statement
- Benefits of cash flow statement
- Distinction between funds flow statement and cash flow statement
- Cash and cash equivalents
- How to prepare cash flow statement

### MEANING OF CASH FLOW STATEMENT

In financial accounting, a cash flow statement, also known as *statement of cash flows* or *funds flow statement*, is a financial statement that shows how changes in balance sheet accounts and income affect cash and cash equivalents, and breaks the analysis down to operating, investing, and financing activities.

A cash flow statement shows inflow and outflow of cash and cash equivalents from various activities of a company during a specific period. The primary objective of cash flow statement is to provide useful information about cash flows (inflows and outflows) of an enterprise during a particular period under various heads, i.e. operating activities, investing activities and financing activities. This information is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of the enterprise to utilize those cash flows. The economic decisions that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing and certainty of their generation.

## **OBJECTIVES OF CASH FLOW STATEMENT**

The following are the objectives of cash flow statement:

1. **Useful in cash planning:** A cash flow statement proves very useful to management by providing a basis to evaluate the ability of a company to generate cash. A cash flow statement prepared on an estimated basis for the next accounting period enables the management to know how much cash can be generated internally and how much it should arrange from outside. Such estimated amounts are used for preparing cash budget.
2. **Assesses cash flow from operating activities:** Cash flow statement provides information about cash generated from operating activities. It provides explanation for the difference in net profit and cash from operations. Cash provided by operating activities is very important to assess the cash generated by internal sources.
3. **Payment of dividends:** Decisions to pay dividends cannot be based on net profit only. Availability of profit in the form of cash is also important for dividend disbursement. Thus, cash provided by operating activities assumes importance for declaration of dividend.
4. **Cash from investing and financing activities:** Cash flow statement provides information not only about cash provided by operating activities but also by non-operating activities under two heads, namely investing activities and financing activities. This helps to explain the overall liquidity position of the enterprise and its ability to meet its cash commitments.

## **BENEFITS OF CASH FLOW STATEMENT**

Cash flow statement provides the following benefits:

1. A cash flow statement, when used along with other financial statements, provides information that enables users to evaluate changes in net assets of an enterprise, its financial structure (including its liquidity and solvency) and its ability to affect the amounts and timings of cash flows in order to adapt to changing circumstances and opportunities.
2. Cash flow information is useful in assessing the ability of the enterprise to generate cash and cash equivalents and enables users to develop models to assess and compare the present value of the future cash flows of different enterprises.
3. It also enhances the comparability of the reporting of operating performance by different enterprises because it eliminates the effects of using different accounting treatments for the same transactions and events.
4. Historical cash flow information is often used as an indicator of the amount, timing and certainty of future cash flows. It is also helpful in checking the accuracy of past assessments of future cash flows and in examining the relationship between profitability and net cash flow and the impact of changing prices.

## **DISTINCTION BETWEEN FUNDS FLOW STATEMENT AND CASH FLOW STATEMENT**

The main points of distinction between funds flow cash flow statements are as follows:

1. A cash flow statement is mainly concerned with changes in cash position while a funds flow statement is concerned with changes in working capital. It should be understood that

working capital is a wide term and includes cash besides other current assets such as debtors, bills receivable, stock in trade, etc. Thus, cash is only one of the constituents of the working capital.

2. For short-term financial analysis, cash flow statement is considered to be more useful to management as compared to funds flow statement. For example, if it is to be found whether a company will be able to meet its obligations maturing within one month, cash flow analysis will prove more realistic than funds flow analysis.
3. The techniques of preparing cash flow statement and funds flow statement are different. In funds flow statement, an increase in a current liability or decrease in a current asset results in decrease in net working capital and vice-versa. But in a cash flow statement, an increase in a current liability or decrease in a current asset (other than cash) might result in increase in cash and vice-versa.
4. A funds flow statement is generally followed by a schedule of changes in working capital. But a cash flow statement is not followed by any other such statement.
5. In cash flow statement, opening and closing balances of cash and cash equivalents are given. But a funds flow statement does not contain any opening and closing balances.
6. There is no legal requirement for preparing funds flow statement. But cash flow statement is to be prepared by every listed company in the prescribed format as required by SEBI.

## CASH AND CASH EQUIVALENTS

As stated earlier, cash flow statement shows inflows and outflows of cash and cash equivalents from various activities of an enterprise during a particular period. 'Cash' comprises cash in hand and demand deposits with banks, and 'Cash equivalents' means short-term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value. Thus, cash equivalents refer to such investments that are held for the purpose of meeting short-term cash commitments rather than for investments or other purposes. An investment normally qualifies as cash equivalent only when it has a short maturity, of say, three months or less from the date of acquisition. Investments in shares are excluded from cash equivalents unless they are in substantial cash equivalents. For example, preference shares of a company acquired shortly before their specific redemption date provided there is only insignificant risk of failure of the company to repay the amount at maturity. Similarly, short-term marketable securities which can be readily converted into cash are treated as cash equivalents.

## CASH FLOWS

'Cash flows' implies movement of cash in and out of non-cash items. Receipt of cash from a non-cash item is termed *cash inflow* while cash payment in respect of such items *cash outflow*. For example, purchase of machinery by paying cash is cash outflow while sale proceeds received from the sale of machinery is cash inflow. Other examples of cash flows include collection of cash from debtors, payment to creditors, payment to employees, receipt of dividend, interest payments, etc. Cash flows exclude movements between items that constitute cash or cash equivalents because these components are part of the cash management of an enterprise rather than part of its operating,

investing or financing activities. Cash management includes the investment of excess cash in cash equivalents. Hence, purchase of marketable securities or short-term investment which constitutes cash equivalents is not considered while preparing cash flow statement.

## **PREPARATION OF CASH FLOW STATEMENT**

Various activities of an enterprise result into cash flows (inflows or receipts and outflows or payments), which is the subject matter of a cash flow statement. These activities are to be classified into three categories: (1) operating, (2) investing, and (3) financing activities so as to show separately the cash flows generated (or used) by (in) these activities. This helps the users of cash flow statement to assess the impact of these activities on the financial position of an enterprise and so also on its cash and cash equivalents.

### **Cash from Operating Activities**

Operating activities are the activities that constitute the primary or main activities of an enterprise, for example, for a company manufacturing garments, procurement of raw material, incurrence of manufacturing expenses, sale of garments, etc. These are the principal revenue producing activities (or the main activities) of the enterprise and other activities that are not investing or financing activities. The amount of cash from operations indicates the internal solvency level of the company, and is regarded as the key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, paying dividends, making of new investments and repaying of loans without recourse to external source of financing. Information about the specific components of historical operating cash flows is useful in conjunction with other information, in forecasting future operating cash flows. Cash flows from operating activities are primarily derived from the main activities of the enterprise. Therefore, they generally result from the transactions and other events that enter into the determination of net profit or loss. Examples of cash flows from operating activities are:

Cash inflows from operating activities:

Cash receipts from sale of goods and the rendering of services.

Cash receipts from royalties, fees, commissions and other revenues.

Cash outflows from operating activities:

Cash payments to suppliers for goods and services.

Cash payments to and on behalf of the employees.

Cash payments to an insurance enterprise for premiums and claims, annuities, and other policy benefits.

Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities.

The net position is shown in the case of operating cash flows.

Some transactions such as sale of an item of plant may give rise to a gain or loss which is included in the determination of net profit or loss. However, the cash flows relating to such transactions are cash flows from investing activities which are discussed in detail later.

An enterprise may hold securities and loans for dealing or trading purposes in which case they are similar to inventory acquired specifically for resale. Therefore, cash flows arising from the purchase and sale of dealing or trading securities are classified as operating activities. Similarly, cash advances and loans made by financial enterprises are usually classified as operating activities since they relate to the main activity of that enterprise.

### **Cash from Investing Activities**

Investing activities relate to purchase and sale of long-term assets or fixed assets such as machinery, furniture, land and building, etc. Transactions related to long-term investments are also investing activities. Investing activities are the acquisition and disposal of long-term assets and other investments not included in cash equivalents. Separate disclosure of cash flows from investing activities is important because they represent the extent to which expenditures have been made for resources intended to generate future income and cash flows. Examples of cash flows arising from investing activities are:

#### *Cash outflows from investing activities:*

- Cash payments to acquire fixed assets, including intangibles and capitalized research and development.
- Cash payments to acquire shares, warrants or debt instruments of other enterprises other than the instruments considered to be cash equivalents or held for trading purposes.
- Cash advances and loans made to a third party (other than advances and loans made by a financial enterprise wherein it is operating activities).

#### *Cash inflows from investing activities:*

- Cash receipt from disposal of fixed assets including intangibles.
- Cash receipt from the repayment of advances or loans made to third parties (except in the case of financial enterprise).
- Cash receipt from disposal of shares, warrants or debt instruments of other enterprises other than receipts from those instruments considered to be cash or cash equivalents or held for trading purposes.
- Interest received in cash from loans and advances.
- Dividend received from investments in other enterprises.

### **Cash from Financing Activities**

As the name suggests, financing activities relate to long-term funds or capital of an enterprise, e.g. cash proceeds from issue of equity shares, debentures, raising long-term bank loans, redemption of bank loan, etc. Financing activities are activities that result in changes in the size and composition of the owners' capital (including preference share capital in the case of a company) and borrowings of the enterprise. Separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprise. Examples of financing activities are:

***Cash inflows from financing activities:***

- Cash proceeds from issuing shares or other similar instruments.
- Cash proceeds from issuing debentures, loans, bonds and other short- or long-term borrowings.

***Cash outflows from financing activities:***

- Cash repayments of amounts borrowed.
- Interest paid on loans, debentures and advances.
- Dividends paid on equity and preference capital.

It is important to mention here that a transaction may include cash flows that are classified differently. For example, when the instalment paid in respect of a fixed asset acquired on deferred payment basis includes both interest and loan, the interest element is classified under financing activities and the loan element is classified under investing activities. Moreover, some activity may be classified differently for different enterprises. For example, purchase of shares is an operating activity for a share brokerage firm while it is an investing activity in the case of other enterprises.

**TREATMENT OF SOME PECULIAR ITEMS**

We will first discuss treatment of extraordinary items.

**Extraordinary Items**

Extraordinary items are not the regular phenomenon, e.g. loss due to theft or earthquake or flood. Extraordinary items are non-recurring in nature and hence cash flows associated with extraordinary items should be classified and disclosed separately as arising from operating, investing or financing activities. This is done to enable users to understand their nature and effect on the present and future cash flows of an enterprise.

**Interest and Dividend**

In the case of a financial enterprise (whose main business is lending and borrowing), interest paid, interest received and dividend received are classified as operating activities while dividend paid is the financing activity. In the case of a non-financial enterprise, it is considered more appropriate to treat payment of interest and dividend as financing activities whereas receipt of interest and dividends are classified as investing activities.

**Taxes on Income and Gains**

Taxes may be income tax (tax in normal profit), capital gains tax (tax on capital profits), and dividend tax (tax on the amount distributed as dividend to shareholders). Cash flows arising from taxes on income should be separately disclosed and should be classified as cash flows from operating activities unless they can be specifically identified with financing and investing activities. This clearly implies that tax on operating profit should be classified as operating cash flows. Dividend tax, i.e. tax paid on dividend should be classified as financing activity along with dividend paid. Capital gains tax paid on the sale of fixed assets should be classified under investing activities.

## Non-cash Transactions

Investing and financing transactions that do not require the use of cash or cash equivalents should be excluded from a cash flow statement. Examples of such transactions are—acquisition of machinery by issue of equity shares, or redemption of debentures by issue of equity shares. Such transactions should be disclosed elsewhere in the financial statements in a way that provides all the relevant information about these investing and financing activities. Hence, stocks acquired by issue of shares are not disclosed in cash flow statement.

## CALCULATION OF CASH FLOWS FROM OPERATIONS OR OPERATING ACTIVITIES

There are two methods of calculating cash flows from operating activities: **direct method** and **indirect method**.

### Direct Method

Under direct method, cash receipts from operating revenues and cash payments for operating expenses are calculated and shown in the cash flow statement. The difference between the total cash receipts and the total cash payments is shown as the net cash flow from the operating activities. Examples of usual cash receipts and payments resulting from operating activities are:

1. Cash sales of goods and services
2. Cash received from debtors
3. Cash payment for purchase of inventories
4. Cash payment to creditors
5. Cash payment for wages, salaries and other operating expenses
6. Cash payment of income tax, etc.

There are many items which appear in the profit and loss account on accrual basis. Necessary adjustments are made to these items to convert them into cash-based items.

#### Note:

Direct method of determining cash flows from operating activities has not been used in this book to solve practical problems. Indirect method is more popular in actual practice and, therefore, it has been used in practical problems.

### Indirect Method

Under the indirect method, the net cash from operating activities is determined by making necessary adjustments in the net profit or loss as disclosed by profit and loss account. Adjustments in net profit or loss are for the effects of:

- (a) Non-cash items like depreciation
- (b) Changes during the period in inventories and operating receivables and payable
- (c) All other items for which cash effects are investing and financing cash flows



The indirect method is also known as *reconciliation method* as it involves a reconciliation of the net profit with net cash flows from the operating activities.

Figure 17.1 shows a pro forma of cash flow statement.

Net Profit for the year	
<i>Add:</i> Non-cash and non-operating expenses	
— Depreciation — Goodwill written off — Preliminary expenses written off — Share discount written off — Loss on sale of fixed assets, investments, etc. — Provision for taxation	
<i>Less:</i> Non-cash and non-operating incomes	
— Profit on sale of fixed assets, investments, etc.	
Net Profit after adjustments for non-cash items	
Adjustments for changes in current operating assets (except cash and cash equivalents) and current operating liabilities (except bank overdraft)	
<i>Add:</i> 1. Increase in current liabilities 2. Decrease in current assets	
<i>Less:</i> 1. Increase in current assets 2. Decrease in current liabilities	
<i>Less:</i> Income tax paid	
Cash from operations	

**Figure 17.1** Pro Forma of Cash Flow Statement

## ILLUSTRATIONS

1. Calculate cash flow operations from the following:

	31.03.2005	31.03.2006
Profit and Loss Account	60,000	65,000
Debtors	85,000	48,000
Bills Receivable	40,000	81,000
General Reserve	1,72,000	2,07,000
Wages outstanding	26,000	8000
Salaries prepaid	8000	10,000
Goodwill	70,000	60,000

**Solution:****Calculation of Cash from Operating Activities**

Profit during the year (65,000 – 60,000)		5000
Add: Transfer to general reserve (2,07,000 – 1,72,000)	35,000	
Goodwill written off (70,000 – 60,000)	10,000	45,000
		50,000
Add: Decrease in debtors (85,000 – 48,000)		37,000
		87,000
Less: Increase in bills receivable (81,000 – 40,000)	41,000	
Increase in salaries prepaid (10,000 – 8000)	2000	
Decrease in wages outstanding (26,000 – 8000)	18,000	61,000
Cash from operations		<b>26,000</b>

2. From the following, calculate cash from operations:

**Profit and Loss Account for the year ended 31.03.2006**

<i>Particulars</i>	<i>Amount</i>	<i>Particulars</i>	<i>Amount</i>
To Salaries	5000	By Gross profit	25,000
To Rent	1000	By Profit on sale of land	5000
To Depreciation	2000	By Income tax refund	3000
To Loss on sale of plant	1000		
To Goodwill written off	4000		
To Proposed dividend	5000		
To Provision for tax	5000		
To Net profit	10,000		
	<b>33,000</b>		<b>33,000</b>

**Solution:**

Net Profit		<b>10,000</b>
Add: Non cash Items		
Depreciation	2000	
Goodwill written off	4000	
Proposed dividend	5000	

*Contd.*

Provision for tax	5000	
Loss on sale of plant	1000	17,000
		27,000
<i>Less: Non-operating incomes</i>		
Profit on sale of land	5000	
Income tax refund	3000	8000
Cash from operations		<b>19,000</b>

3. Prepare cash flow statement on the basis of the following balance sheets of Sri. Harsha Hotels Ltd.:

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Share capital	2,00,000	2,50,000	Goodwill	10,000	2000
12% Debentures	1,00,000	80,000	Land and building	2,00,000	2,80,000
General reserve	50,000	70,000	Machinery	1,00,000	1,30,000
Creditors	40,000	60,000	Debtors	40,000	60,000
Bills payable	20,000	1,00,000	Stock	70,000	90,000
Outstanding expenses	25,000	20,000	Cash	15,000	18,000
	4,35,000	5,80,000		4,35,000	5,80,000

***Solution:***

(i) Cash from Operating Activities	Amount (₹)	Amount (₹)
Profit during the year transferred to general reserve (70,000 – 50,000)	20,000	
<i>Add:</i> Goodwill written off (10,000 – 2000)	8000	
Increase in creditors	20,000	
Increase in bills payable	80,000	
	<b>1,28,000</b>	
<i>Less:</i> Increase in debtors	–20,000	
Increase in stock	–20,000	
Decrease in outstanding expenses	–5000	
Cash inflow from operating activities		<b>83,000</b>
(ii) Cash from Investing Activities		
Purchase of land and building	–80,000	
Purchase of machinery	–30,000	
Cash outflow from investing activities		<b>–1,10,000</b>

*Contd.*

(iii) Cash from financing activities		
Issue of shares	50,000	
Redemption of debentures	–20,000	
Cash inflow from financing activities		<b>30,000</b>
Net increase in cash		<b>3000</b>
<i>Add:</i> Cash balance in the beginning of the year		<b>15,000</b>
Cash balance at the end of the year		<b>18,000</b>

4. The balance sheets of “36 China Town” Hotel as on December 31 of two years are given below.

	2006	2005
<b>Assets</b>		
Cash balances	60,000	50,000
Trade debtors	1,00,000	75,000
Inventory	1,20,000	1,40,000
Land	80,000	1,00,000
Plant and machinery	2,50,000	2,00,000
<b>Total</b>	<b>6,10,000</b>	<b>5,65,000</b>
<b>Liabilities and capital</b>		
Trade creditors	40,000	30,000
Debentures	90,000	1,50,000
Provision for depreciation on plant	80,000	60,000
Equity share capita	2,40,000	2,00,000
Retained earnings	1,60,000	1,25,000
<b>Total</b>	<b>6,10,000</b>	<b>5,65,000</b>

Cash Dividend of ₹ 25,000 has been paid during the year.

You are required to prepare a cash flow statement.

***Solution:***

(i) Cash from operating activities		
Net profit during the year (25,000 – 35,000)		60,000
<i>Add:</i> Depreciation (80,000 – 60,000)		20,000
Net increase in inventory (1,40,000 – 1,20,000)		20,000
Net increase in creditors (40,000 – 30,000)		10,000
<i>Less:</i> Net increase in debtors (1,00,000 – 75,000)		25,000
Net Inflow from operating activities		<b>85,000</b>

*Contd.*

(ii) Cash flow from investing activities		
Purchase of plant and machinery	– 50,000	
Sale of land	20,000	
Net cash flow from investing activities		<b>–30,000</b>
(iii) Cash flow from financing activities		
Issue of share capital (2,40,000 – 2,00,000)	40,000	
Redemption of debentures (1,50,000 – 80,000)	–60,000	
Dividend paid	–25,000	
Net cash inflow from financing activities		<b>–45,000</b>
Net increase in cash (85,000 – 30,000 – 45,000)		10,000
Add: Cash balance at the beginning		50,000
Cash balance at the end		<b>60,000</b>

5. The Balance Sheet of Hotel Jewel as on 31st March 2007 and 31st March 2008 are as follows:

<i>Particulars</i>	<i>2007</i>	<i>2008</i>
<b>Assets</b>		
Land and building	80,000	1,20,000
Plant and machinery	5,00,000	8,00,000
Stock	1,00,000	75,000
Sundry debtors	1,40,000	1,50,000
Prepaid expenses	14,000	12,000
Cash at bank	16,000	18,000
<b>Total</b>	<b>8,50,000</b>	<b>11,75,000</b>
<b>Liabilities</b>		
Share capital	5,00,000	7,00,000
Profit & loss	1,00,000	1,60,000
General reserve	50,000	70,000
Sundry creditors	1,63,000	2,00,000
Bills payable	30,000	40,000
Outstanding expenses	7000	5000
	<b>8,50,000</b>	<b>11,75,000</b>

Additional information:

- ₹ 50,000 depreciation has been charged to plant and machinery during the year 2008.
- A piece of machinery was sold for ₹ 8000 during 2006. It had cost ₹ 12,000. Depreciation of ₹ 7000 has been provided for it. Prepare cash flow statement.

**Solution:****Plant and Machinery A/c**

To Balance b/d	5,00,000	By Cash sale	8000
To Profit on sale	3000	By Depreciation	50,000
To Cash purchase	3,55,000	By Balance c/d	8,00,000
	8,58,000		8,58,000

**Cash Flow Statement**

(i) Cash from operating activities		
Profit during the year (1,60,000 – 1,00,000)	60,000	
<i>Add:</i>		
Depreciation on machinery	50,000	
General reserve (70,000 – 50,000)	20,000	
Decrease in stock	25,000	
Decrease in prepaid expenses	2000	
Increase in creditors	37,000	
Increase in bills payable	10,000	
		<b>2,04,000</b>
<i>Less:</i>		
Gain on sale of machinery	– 3000	
Increase in debtors	–10,000	
Decrease in outstandings	–2000	15,000
Cash flow from operating activities		<b>1,89,000</b>
(ii) Cash from investing activities		
<i>Add:</i> Sale of machinery	8000	
<i>Less:</i> Purchase of machinery	–3,55,000	
<i>Less:</i> Purchase of land and building	–40,000	
Cash outflow from investing activities		<b>–3,87,000</b>
(iii) Cash from financing activities		
Issue of shares	2,00,000	
Cash inflow from financing activities		<b>2,00,000</b>
Net increase in cash		2000
<i>Add:</i> Cash balance in the beginning of the year		16,000
Cash balance at the end of the year		<b>18,000</b>

### Objective Type Questions

State whether the following statements are true or false:

- Cash flow statement reveals the effects of transactions involving movement of cash.
- In cash flow analysis, funds mean current assets.
- Increase in the amount of debtors results in decrease in cash.
- Cash from operation is equal to net profit plus increase in outstanding expense.
- Increase in the amount of creditors results in decrease in cash.

### Review Questions

- What is a cash flow statement?
- What are the benefits of cash flow statement?
- What are the objectives of cash flow statement?
- Distinguish between cash flow statement and fund flow statement.

### Exercises

- Calculate cash flow from operations from the following information of Hotel Ashoka:

<i>Particulars</i>	<i>2006</i>	<i>2005</i>
Profit made during the year	2,50,000	—
Income received in advance	500	600
Prepaid expenses	1600	1400
Debtors	80,000	95,000
Bills receivable	25,000	20,000
Creditors	45,000	40,000
Bills payable	13,000	15,000
Outstanding expenses	2500	2000
Accrued income	1500	1200

- From the following balances, calculate cash from operations:

<i>Particulars</i>	<i>31.12.2005</i>	<i>31.12.2006</i>
Bills receivable	50,000	47,000
Debtors	10,000	12,500
Bills payable	20,000	25,000

*Contd.*

Creditors	8000	6000
Outstanding expenses	1000	1200
Prepaid expenses	800	700
Accrued income	600	750
Income received in advance	800	250
Profit made during the year	—	70,000

3. Given below are the Balance Sheets of Hotel Orange County:

<i>Liabilities</i>	<i>2006</i>	<i>2007</i>	<i>Assets</i>	<i>2006</i>	<i>2007</i>
Creditors	40,000	44,000	Cash	10,000	7000
Mrs. P's loan	25,000	—	Debtors	30,000	50,000
Loans from bank	40,000	50,000	Stock	35,000	25,000
Capital	1,25,000	1,53,000	Machinery	80,000	55,000
			Land	40,000	50,000
			Building	35,000	60,000
	2,30,000	2,47,000		2,30,000	2,47,000

During the year, a machine costing ₹ 10,000 (accumulated depreciation ₹ 3000) was sold for ₹ 5000. The provision for depreciation against machinery on 1st January 2007 was ₹ 25,000 and on 31st December 2007 was ₹ 40,000. Net profit for the year amounted to ₹ 45,000.

4. Following are the comparative balance sheets of Hotel Windsor Manor:

<i>Liabilities</i>	<i>2007</i>	<i>2008</i>	<i>Assets</i>	<i>2007</i>	<i>2008</i>
Share capital	70,000	74,000	Cash	9000	7800
Debentures	12,000	6000	Trade debtors	14,900	17,700
Trade creditors	10,360	11,840	Stock	49,200	42,700
Provision for doubtful debts	700	800	Land	20,000	30,000
Profit and loss	10,040	10,560	Goodwill	10,000	5000
	1,03,100	1,03,200		1,03,100	1,03,200

Additional information:

(a) Dividends were paid totaling to ₹ 3500.



- (b) Land was purchased for ₹ 10,000 and amount provided for amortization of goodwill totalled ₹ 5000.
- (c) Debenture loan was repaid ₹ 6000.

You are required to prepare cash flow statement.

5. The following are the balance sheets of Le Chancery Hotel:

<i>Liabilities</i>	<i>2005</i>	<i>2006</i>	<i>Assets</i>	<i>2005</i>	<i>2006</i>
Equity share capital	3,00,000	4,00,000	Goodwill	1,15,000	90,000
Preference capital	1,50,000	1,00,000	Land & building	2,00,000	1,70,000
General reserve	40,000	70,000	Plant	80,000	2,00,000
Profit & Loss A/c	30,000	48,000	Debtors	1,60,000	2,00,000
Proposed dividend	42,000	50,000	Stock	77,000	1,09,000
Creditors	55,000	83,000	Bills receivable	20,000	30,000
Bills payable	20,000	16,000	Cash in hand	15,000	10,000
Provision for tax	40,000	50,000	Cash at bank	10,000	8000
	6,77,000	8,17,000		6,77,000	8,17,000

It is also given that:

- (a) Depreciation of ₹ 20,000 on land and building and ₹ 10,000 on plant have been charged in 2006.
- (b) Interim dividend of ₹ 20,000 has been paid in 2006.
- (c) Income tax ₹ 35,000 has been paid during 2006.

Prepare a cash flow statement.

# 18

## Chapter

# Fund Flow Statement

### Learning Objectives

*This chapter would help the reader to understand:*

- Meaning of funds and fund flow
- Meaning of fund flow statement
- Objectives of fund flow statement
- Advantages of fund flow statement
- Limitations of fund flow statement
- Preparation of fund flow statement

### MEANING OF FUNDS AND FUND FLOW

In accounting terms, 'funds' mean net working capital, which is the difference between current assets and current liabilities. All transactions that result in a change in working capital are taken into consideration. Even if there is any change in the fixed assets or liabilities, it will get reflected in the working capital through the net working capital. For example, if furniture is sold or purchased, it will reflect the cash balance. Flow of funds means that there is a change in the amount of working capital. It takes place when non-working capital items cause a change in the net working capital. Flow of funds takes place only if one part of the item is a non-working capital item and the other a working capital item. For example, issue of shares will involve shares and cash. On the other hand, if both the items are working capital items like payment received from debtors, there will be no fund flow.

## AN OVERVIEW OF FUND FLOW STATEMENT

Fund Flow Statement reveals resources from which funds were obtained by the firm and the specific uses to which such funds were applied. The effectiveness of financial management in procuring funds from various sources and using them effectively for generating income without sacrificing the financial position of the firm is reflected in the fund flow statement.

According to R.A. Foulke, a fund flow statement is “a statement of source and application of fund—is a technical devise designed to analyze the changes in the financial condition of business enterprises between two dates.”

According to Almond Coleman, “the fund flow statement the significant financial changes which between the beginning and the end of a company’s accounting periods.”

A fund flow statement is prepared from two consecutive balance sheets. It provides an analysis of sources of internal funds available to the business through its business activities and also from external sources. It also brings to light how these funds have been utilized.

### Sources of Funds

- (a) Trading profits
- (b) Issue of shares and debentures
- (c) Borrowings
- (d) Sale of fixed assets
- (e) Income from investments
- (f) Decrease in working capital

### Application of Funds

- (a) Trading losses
- (b) Purchase of fixed assets
- (c) Repayments of borrowings
- (d) Payment of taxes and dividends
- (e) Increase in working capital

### Objectives of Fund Flow Statement

The main objectives of fund flow statement are:

- (a) To summarize the financing and investing activities of the business enterprise and also the extent to which funds have been generated from the business operations.
- (b) To disclose the changes in the financial position of the business as a part of the final accounts.

### Advantages of Fund Flow Statement

The advantages of fund flow statement are as follows:

- (a) To analyse the business performance during a particular period.
- (b) To help in the long-term financing and investment decision making.
- (c) It records the changes taking place in all the assets and liabilities.

- (d) It reflects the major decisions regarding how the funds have been used for investment or repayments and how the funds have been acquired through operations or borrowings.
- (e) The statement is prepared from the profit and loss account and the balance sheet, so it is a part of the final accounts.

### Limitations of Fund Flow Statement

The limitations of fund flow statement are as follows:

- (a) It is not the basic financial statement, but a secondary statement which is dependent on other data.
- (b) It is not self-explanatory.
- (c) It does not take into account non-fund transactions.
- (d) The statement is meaningful only if presented along with the final accounts.
- (e) The data provided is historic in nature.
- (f) The statement has the same limitations of the profit and loss account and the balance sheet.

### STATEMENT OF CHANGES IN WORKING CAPITAL

The statement of sources and applications of funds shows the difference between the aggregate of sources and total applications as either increase or decrease in the working capital. This variation in working capital can be verified by preparing a statement of change in working capital. This statement, unlike statement of sources and applications, is prepared with the help of only current assets and liabilities. A pro forma of such a statement of changes in working capital is given in Fig. 18.1. It should be remembered that such a statement is prepared only from the information given in the balance sheets and there is no effect on that statement of any additional information supplied outside the balance sheet.

While preparing the statement, it should be noted that:

1. Increases in current assets result in increase (+) in working capital.
2. Decreases in current assets result in decrease (–) in working capital.
3. Increases in current liabilities result in decrease (–) in working capital.
4. Decreases in current liabilities result in increase (+) in working capital.

In order to prepare a fund flow statement, it is necessary to find out the various sources and applications of funds. The various sources and applications of funds are given below in Fig. 18.2 a pro forma of fund flow statement.

Various sources and applications of funds are calculated from the comparative balance sheets and additional information given. For example, if share capital has increased from one year to next year, it shows source of fund from issue of shares. If the question is silent about the nature of shares, it may be assumed that shares were issued from cash and the amount of increase is recorded on the sources side. It applies to both equity and preference shares. In the case of preference shares, there may be decrease during the period. It means preference shares were redeemed during the year unless otherwise stated. It is thus recorded as an application of funds; similar procedure is followed in respect of other items in the balance sheets. Figuer 18.3 shows the various sources and applications of funds.

### Statement of Changes in Working Capital

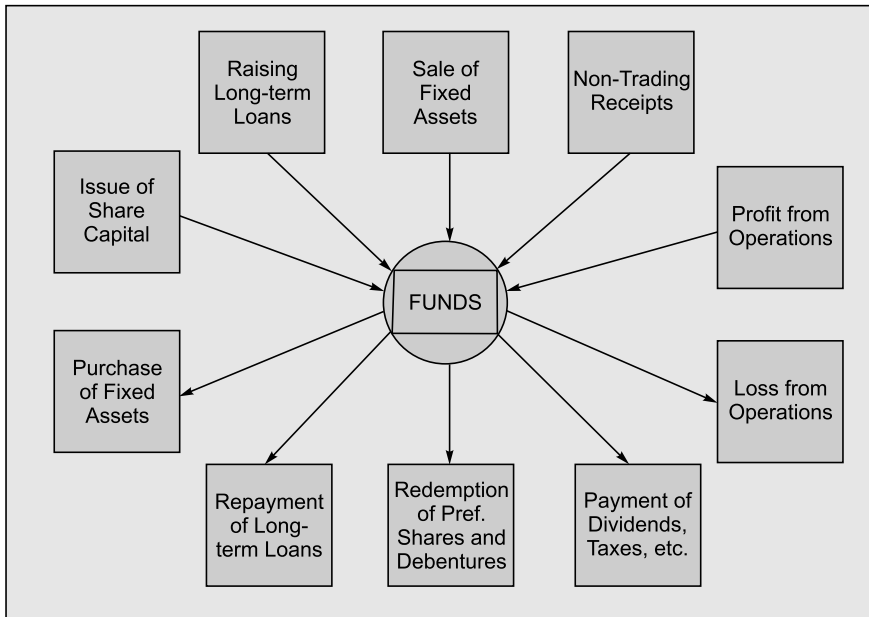
Particulars	Amt. of previous Year	Amt. of current Year	Change in	
			Increase	Decrease
<b>A. CURRENT ASSETS</b>				
Cash				
Bank				
Debtors				
Bills Receivable				
Stock				
Marketable Security				
Advance (debit)				
Investor				
Short-term investment				
Prepaid expenses				
<b>Total</b>				
<b>B. CURRENT LIABILITIES</b>				
Creditors				
Bills Payable				
Outstanding expenses				
Outstanding liability				
Bank overdraft				
Advances (credit)				
Short-term loan				
Provision for doubtful debts				
Provision for taxation				
Proposed dividend				
<b>Total</b>				
<b>Working Capital</b>				
(A – B)				
<b>Increase/Decrease in Working Capital</b>				

**Figure 18.1** *A Specimen of Statement of Changes in Working Capital*

## Fund Flow Statement

STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS	
<b>Sources of Funds:</b>	
(a) Issue of Share Capital	
(b) Issue of Debentures	
(c) Loans from Institutions	
(d) Sale of non-current assets and investments	
(e) Fund From Operations (Profit)	
A. Total Sources	
<b>Applications of Funds</b>	
(a) Redemption of Preference Shares	
(b) Redemption of Debentures	
(c) Repayment of Loans	
(d) Purchase of non-current assets	
(e) Loss from Operation (Loss)	
(f) Payment of Dividend, Tax, etc.	
B. Total Applications	
<b>Net Increase/Decrease in Working Capital (A – B)</b>	

**Figure 18.2** A Pro Forma of Fund Flow Statement



**Figure 18.3** Sources and Applications of Funds

It may be generalized that sources of funds are indicated by increases in equities and decreases in assets. The generalizations can be put in the form of an equation as follows:

1. Sources = Applications or Uses.
2. (Increases in Equities + Decreases in Assets) = (Increases in Assets + Decreases in Equities)

This relationship can also be explained in terms of debits and credits. Increases in equities and decreases in assets are both credits; increases in assets and decreases in equities are both debits. Thus the above equation follows from the fact that the changes in debits must equal to the changes in credits.

### ITEM REQUIRING SPECIAL ATTENTION

Given below are certain items, that require special attention while preparing a statement of sources and application of funds.

#### Fund From Operations

Profit is a very important source of fund in a business. In fact, profit from operations is the only item of source, which is generated by the internal sources, i.e., by the operations of business activities. However, it is important to note that net profit as shown by the P&L account does not always correctly represent the amount of fund from business operations. The reason is simple. There are certain items which appear in the P&L account but do not involve any payment in cash, e.g., depreciation, writing off goodwill and preliminary expenses, etc. These types of items do not have any effect on the working capital and are termed *non-fund items*. The net profit, as shown by the P&L account, has to be adjusted for these non-fund items so as to arrive at the real fund from operations. The following are the main adjustments:

**Add:** Generally the following items are added back to net profit:

- (i) Depreciation on fixed assets.
- (ii) Written off fictitious and intangible items like goodwill, preliminary expenses, discount on issue of shares, etc.
- (iii) Loss on the sale of fixed assets: This item is added back to net profit because the net proceeds from the sale of fixed assets is shown as a source of funds in the funds flow statement as a separate item.
- (iv) Appropriations of profit: Items like transfer to general reserve and sinking fund, etc. are appropriations of profit and are thus added back to profit to determine the fund from operations. But if these items appear in the profit and loss appropriation account and profit before appropriation is being considered, these items are not added back to profit.
- (v) Dividend on shares is also an appropriation of profit and is thus added back to profit if dividend is shown before ascertaining profit.

**Deduct:** The following items are deducted from the net profit as they do not result in increase of funds:

- (i) Profit on the sale of fixed assets: This item is deducted from net profit because the total amount realized from the sale of fixed assets is shown as a source of fund in the fund flow statement as a separate item.

- (ii) Profit on revaluation of fixed assets. This item is deducted from net profit because this is a non-cash item.
- (iii) Non-operating incomes such as dividend and interest received, rental income, refund of taxes, etc. are deducted from net profit because such items are separately shown as sources of fund in the fund flow statement.

There are two methods of computing fund from operations. In the first method, we start with net profit and then add and deduct items as described above so as to arrive at funds from operations. In the second method, we start with sales figure, which is the main source of fund. From this sales figure, all such expenses are deducted which are uses or applications of fund. Both of these methods give the same amount of fund from operations.

### ***Determination of Fund from Operations in Case of Net Loss***

If P&L account shows a net loss, it does not necessarily mean that there is loss from operations. If the non-fund items on the debit side of P&L account exceed the aggregate of net loss and non-fund items appearing in the credit side of P&L account, the difference would represent funds from operations and vice versa.

### ***Calculation of Funds from Operations***

Funds from operations may be computed by preparing a statement by starting with the net profit already calculated and then add and deduct items to arrive at funds from operations. Alternatively, funds from operations may be calculating by preparing adjusted P&L account in T-form as shown in Fig. 18.4.

### **Adjusted Profit and Loss Account**

To Non fund items:		By Net Profit b/d	
– Depreciation		By Non-operating Incomes	
– Loss on sale of fixed assets		– Interest Received	
– Premium on redemption of debentures/ Preference shares		– Dividend Received	
– Discount on issue of Shares and Debentures		– Refund of taxes	
– Goodwill written off		– Profit on sale of non-current assets	
– Patent written off		By Fund From Operations (Balancing Figure)	
– Preliminary Expenses written off			
Appropriations of Profits:			
– General Reserve			
– Debenture Sinking Fund			
– Proposed Dividend			
– Interim Dividend			
– Provision for Taxation			
Net Profit c/d			

**Figure 18.4** A Pro Forma of Adjusted P&L Account



### **Treatment of Provision from Taxation**

Provision for taxation may be treated in either of the following two ways while preparing a funds flow statement:

#### ***As a Current Liability***

When provision for taxation is treated as a current liability, it appears in the statement of changes in working capital. In such a case, it will not be taken into account for calculating funds from operations and nothing appears on application side of the funds flow statement on account of taxation.

#### ***As a Non-current Liability***

When provision for taxation is treated as a non-current liability, provision created during the year is added back in profit to calculate funds from operations and the tax paid during the year is shown as an application of fund in the fund flow statement. In this case, it does not appear in the statement of changes in working capital.

### **Treatment of Proposed Dividend**

This item may be treated in either of the two ways stated below:

#### ***As a Current Liability***

In such a situation, it appears in the statement of changes in working capital and no adjustment is made in the calculation of funds from operations. It is also not recorded in the fund flow statement as an application.

#### ***As a Non-current Liability***

When proposed dividend is treated as a non-current item, it is added back in profit to calculate the funds from operations and dividend actually paid is shown as an application of funds in the funds flow statement. It does not appear in the statement of changes in working capital.

#### **Important Note:**

Treatment of proposed dividend as a non-current item is mostly used in actual practice.

### **Treatment of Interim Dividend**

Interim dividend paid is shown as an application of fund in the fund flow statement. It is also added back in the net profit for calculating the funds from operations if it has already been debited to the profit and loss account.

## ILLUSTRATIONS

1. Prepare a statement showing changes in Working Capital from the following Balance Sheet:

<i>Liabilities</i>	<i>2000</i>	<i>2001</i>	<i>Assets</i>	<i>2000</i>	<i>2001</i>
Share Capital	4,60,000	4,60,000	Land & Building	3,00,000	3,00,000
Profit & Loss A/c	32,000	46,000	Machinery	1,04,000	1,40,000
Reserves	12,000	12,000	Investments	2,20,000	1,48,000
8% Debentures	1,80,000	1,40,000	Stock	1,64,000	2,12,000
Depreciation fund	80,000	88,000	Debtors	1,34,000	86,000
Creditors	2,06,000	1,92,000	Cash	1,80,000	1,80,000
Outstanding liabilities for expenses	26,000	24,000	Prepaid expenses	2000	4000
	<b>11,04,000</b>	<b>10,70,000</b>		<b>11,04,000</b>	<b>10,70,000</b>

**Solution:**

## Statement of Changes in Working Capital

<i>Particulars</i>	<i>2000</i>	<i>2001</i>	<i>Change in</i>	
			<i>Increase</i>	<i>Decrease</i>
A. Current Assets				
Stock	1,34,000	86,000		48,000
Debtors	1,64,000	2,12,000	48,000	
Prepaid expenses	2000	4000	2000	
<b>Total</b>	<b>3,00,000</b>	<b>3,00,000</b>		
B. Current Liabilities				
Creditors	2,06,000	1,92,000	14,000	
Outstanding liability	26,000	24,000	2000	
<b>Total</b>	<b>2,32,000</b>	<b>2,16,000</b>		
Working Capital (A – B)	68,000	86,000		
Increase in Working Capital	18,000			<b>18,000</b>
	<b>86,000</b>	<b>86,000</b>	<b>66,000</b>	<b>66,000</b>

2. Prepare a statement showing changes in Working Capital from the following Balance Sheet:

<i>Liabilities</i>	<i>2000</i>	<i>2001</i>	<i>Assets</i>	<i>2000</i>	<i>2001</i>
Share Capital	40,000	42,000	Land & Building	25,000	25,000
Profit & Loss A/c	7250	12,250	Plant	12,000	17,000
Sundry Creditors	4000	2500	Stock	4000	3000
Mortgage	—	5000	Debtors	8000	10,000
Outstanding liabilities for expenses	1000	1250	Cash	3000	7500
			Prepaid expenses	250	500
	<b>52,250</b>	<b>63,000</b>		<b>52,250</b>	<b>63,000</b>

**Solution:**

### Statement of Changes in Working Capital

<i>Particulars</i>	<i>2000</i>	<i>2001</i>	<i>Change in</i>	
			<i>Increase</i>	<i>Decrease</i>
A. Current Assets				
Debtors	8000	10,000	2000	
Stock	4000	3000	—	1000
Prepaid expenses	250	500	250	
Cash	3000	7500	4500	
<b>Total</b>	<b>15,250</b>	<b>21,000</b>		
B. Current Liabilities				
Creditors	4000	2500	1500	
Outstanding liability	1000	1250	—	250
<b>Total</b>	<b>5000</b>	<b>3750</b>		
Working Capital (A – B)	10,250	17,250		
Increase in Working Capital	7000			<b>7000</b>
	<b>17,250</b>	<b>17,250</b>	<b>8250</b>	<b>8250</b>

3. Prepare a statement showing changes in Working Capital from the following Balance Sheet:

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Equity Share Capital	1,00,000	1,00,000	Long-term investments	1,00,000	98,000
General Reserve	15,000	20,000	Fixed Assets	5000	12,000

*Contd.*

P&L A/c	10,000	25,000	Debtors	10,000	20,000
Bills Payable	3000	2000	Bills Receivable	4000	3000
Creditors	10,000	5000	Stock	15,000	6000
Outstanding Expenses	3000	—	Prepaid Expenses	2000	—
Bank overdraft	—	2000	Advances	5000	17,000
Proposed dividend	5000	8000	Cash	8000	10,000
Provision for tax	3000	4000			
	<b>1,49,000</b>	<b>1,66,000</b>		<b>1,49,000</b>	<b>1,66,000</b>

**Solution:**

### Statement of Changes in Working Capital

Particulars	2003	2004	Change in	
			Increase	Decrease
<b>A. Current Assets</b>				
Debtors	10,000	20,000	10,000	
Bills Receivable	4000	3000	—	1000
Stock	15,000	6000	—	9000
Prepaid Expenses	2000	—	—	2000
Advances	5000	17,000	12,000	—
Cash	8000	10,000	2000	—
<b>Total</b>	<b>44,000</b>	<b>56,000</b>		
<b>B. Current Liabilities</b>				
Bills Payable	3000	2000	1000	
Creditors	10,000	5000	5000	
Outstanding Expenses	3000	—	3000	
Bank Overdraft	—	2000	—	2000
Proposed dividend	5000	8000	—	3000
Provision for tax	3000	4000	—	1000
<b>Total</b>	<b>24,000</b>	<b>21,000</b>		
Working Capital (A – B)	20,000	35,000		
Increase in Working Capital	15,000			<b>15,000</b>
	<b>35,000</b>	<b>35,000</b>	<b>33,000</b>	<b>33,000</b>

**Speciman of Adjusted Profit and Loss A/c**

Dr.

Cr.

<i>Particulars</i>	<i>Amount (₹)</i>	<i>Particulars</i>	<i>Amount (₹)</i>
To Premium on debentures		By Opening balance b/d	
To Depreciation on fixed assets		By Transfer from excess provision	
To Transfer to general reserve		By Appreciation in fixed assets	
To Loss on sale of fixed assets		By Profit on sale of fixed assets	
To Discount on issue of Shares		By Tax refund	
To Dividend paid		By Rent/ dividend received	
To Proposed dividend		By Profit in non-trading activities	
To Provision on taxation		By Fund from operation	
To Operational profit c/d			
To Preliminary expenses written off			
To Goodwill written off			
To Closing balance c/d			

4. During the year 2005, Sun Star Hotel earned a profit of ₹ 1,85,700 after adjusting the following:

Provision for bad debts	1500
Salaries	8500
Depreciation written off	15,300
Profit on sale of fixed assets	14,000
Discount on debentures written off	20,000
Loss on sale of investments	2000
Preliminary expenses written off	8000
Proposed dividend	50,000
Transfer to debenture redemption fund	20,000
Dividend received	4500
Calculate fund from operations.	

***Soluton:*****Adjusted Profit and Loss A/c**

Dr.

Cr.

To Depreciation	15,300	By Profit on sale of Fixed Assets	14,000
To Discount on debtors	20,000	By Dividend received	4500

*Contd.*

To Loss on sale of investments	2000	By Fund From Operations	2,82,520
To preliminary expenses written off	8000		
To Proposed dividend	50,000		
To Debenture Redemption Fund	20,000		
To Net Profit	1,85,700		
	<b>3,01,000</b>		<b>3,01,000</b>

5. Net Profit (opening balance)	30,000
Depreciation on Building	30,000
Goodwill written off	25,000
Transfer to general reserve	30,000
Proposed dividend	50,000
Interim dividend	20,000
Net profit at the end of the year	48,000
Calculate fund from operations.	

**Solution:****Adjusted Profit and Loss A/c**

Dr.

Cr.

To Depreciation on Building	30,000	By Opening Balance b/d	30,000
To Goodwill written off	25,000	By Fund From Operations	1,73,000
To Transfer to general Reserve	30,000		
To Interim dividend	20,000		
To Proposed dividend	50,000		
To Closing Balance C/d	48,000		
	<b>2,03,000</b>		<b>2,03,000</b>

6. Calculate fund from operations from the following information:

General Reserve	50,000
Proposed dividend	1,80,000
Depreciation of building	40,000
Tax provisions	1,70,000
Dividend received	50,000
Profit for the year	1,50,000
Depreciation on machinery	60,000
Premium on redemption of shares	20,000
Profit for the last year	1,00,000
Profit on sale of machinery	1,00,000

**Solution:**

**Adjusted Profit and Loss A/c**

Dr.		Cr.	
To General Reserve	50,000	By Profit on sale of Fixed Assets	1,00,000
To Proposed dividend	1,80,000	By Dividend received	50,000
To Depreciation on building	40,000	By Fund from Operations	5,20,000
To Tax Provision	1,70,000		
To Depreciation on machinery	60,000		
To Premium on redemption	20,000		
To Balance c/d	1,50,000		
	<b>6,70,000</b>		<b>6,70,000</b>

7. Calculate fund from operations from the following information:

Debtors	25,000
Goodwill written off	10,000
Profit on sale of machinery	15,000
Premium on redemption of debentures	2500
Debenture discount written off	3000
Profit on sale of investment	10,000
Loss on machine discarded	3000
Provision for Income Tax	35,000
Proposed Dividend	40,000
General Reserve	20,000
Depreciation on plant and machinery	75,750
Debtors	35,000
Profit for 31.03.2005	30,000
Profit for 31.03.2006	50,000

**Solution:**

**Adjusted Profit and Loss A/c**

Dr.		Cr.	
To Goodwill written off	10,000	By Balance b/d	30,000
To Debenture discount written Off	3000	By Profit on sale of machinery	15,000
To Premium on Debentures	2500	By Profit on sale of investment	10,000

*Contd.*

To Loss on machinery	3000	By Fund From Operations	1,84,250
To Provision for tax	35,000		
To Proposed Dividend	40,000		
To Reserves	20,000		
To Depreciation on Plant & Machinery	75,750		
To Balance c/d	50,000		
	<b>2,39,250</b>		<b>2,39,250</b>

### Speciman of Fund Flow Statement

<i>Sources (Inflows)</i>	<i>Amt. (₹)</i>	<i>Applications (Outflows)</i>	<i>Amt. (₹)</i>
Issue of Shares		Redemption of Shares	
Issue of Debentures		Redemption of Debentures	
Sale of fixed assets		Payment of long-term loans	
Long-term borrowings		Purchase of fixed assets	
Sale of investment		Purchases of investments	
Fund From Operation/Trading Profit		Payment of taxes/dividends	
Decrease in Working Capital		Funds from Operations/Operating loss	
		Increase in Working Capital	
<b>Total</b>		<b>Total</b>	

8. You are required to prepare a Fund Flow Statement from the following Balance Sheets:

<i>Liabilities</i>	<i>2000</i>	<i>2001</i>	<i>Assets</i>	<i>2000</i>	<i>2001</i>
Equity Share Capital	3,00,000	3,00,000	Land	–	1,10,000
Reserve fund	–	20,000	Buildings	2,00,000	1,95,000
Profit & Loss A/c	50,000	60,000	Machinery	80,000	72,000
11% Debentures	–	1,00,000	Furniture	20,000	16,000
Loan	80,000	60,000	Debtors	73,000	1,00,000
Creditors	25,000	36,000	Investments	27,000	25,000
Bills Payable	14,000	24,000	Bills Receivable	10,000	25,000
Outstanding Expenses	11,000	5000	Bank	50,000	44,000
			Cash	20,000	18,000
	<b>4,80,000</b>	<b>6,05,000</b>		<b>4,80,000</b>	<b>6,05,000</b>

Except land there is no purchase or sale.



**Solution:**

**Statement of Changes in Working Capital**

Particulars	2000	2001	Change in	
			Increase	Decrease
A. Current Assets				
Debtors	73,000	1,00,000	27,000	
Investments	27,000	25,000	—	2000
Bills Receivable	10,000	25,000	15,000	—
Bank	50,000	44,000	—	6000
Cash	20,000	18,000	—	2000
<b>Total</b>	<b>1,80,000</b>	<b>2,12,000</b>		
B. Current Liabilities				
Creditors	25,000	36,000	—	11,000
Bills Payable	14,000	24,000	—	10,000
Outstanding Expenses	11,000	5000	6000	—
<b>Total</b>	<b>50,000</b>	<b>65,000</b>		
Working capital (A – B)	1,30,000	1,47,000		
Increase in Working Capital	17,000			<b>17,000</b>
	<b>1,47,000</b>	<b>1,47,000</b>	<b>48,000</b>	<b>48,000</b>

**Building A/c**

Dr.

Cr.

To Balance b/d	2,00,000	By Depreciation	5000
		By Balance c/d	1,95,000
	<b>2,00,000</b>		<b>2,00,000</b>

**Machinery A/c**

Dr.

Cr.

To Balance b/d	80,000	By Depreciation	8000
		By Balance c/d	72,000
	<b>80,000</b>		<b>80,000</b>

**Furniture A/c**

Dr.

Cr.

To Balance b/d	20,000	By Depreciation	4000
		By Balance c/d	16,000
	<b>20,000</b>		<b>20,000</b>

**Loan A/c**

Dr.

Cr.

To Cash (repayment)	20,000	By Balance b/d	80,000
To Balance c/d	60,000		
	<b>80,000</b>		<b>80,000</b>

**Adjusted Profit and Loss A/c**

Dr.

Cr.

To Reserve fund	20,000	By Balance b/d	50,000
To Depreciation on building	5000	By Fund From Operation	47,000
To Depreciation on machinery	8000		
To Depreciation on furniture	4000		
To Balance c/d	60,000		
	<b>97,000</b>		<b>97,000</b>

**Fund Flow Statement**

<i>Sources</i>	<i>Amt. (₹)</i>	<i>Applications</i>	<i>Amt. (₹)</i>
Issue of Debentures	1,00,000	Repayment of loan	20,000
Fund from Operations	47,000	Purchase of land	1,10,000
		Increase in Working Capital	17,000
	<b>1,47,000</b>		<b>1,47,000</b>

9. The Balance Sheet of Black & White as on 1.1.2004 and 31.12.2004 is as follows. Prepare:

- (i) Statement of changes in working capital
- (ii) Fund flow statement.

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Creditors	40,000	44,000	Cash	10,000	7000
Mrs. White's Loan	25,000	—	Debtors	30,000	50,000
Loan from PNB	40,000	50,000	Stock	35,000	25,000
Capital	1,25,000	1,53,000	Machinery	80,000	55,000
			Land	40,000	50,000
			Building	35,000	60,000
	<b>2,30,000</b>	<b>2,47,000</b>		<b>2,30,000</b>	<b>2,47,000</b>

Additional information:

- (i) During the year, machinery costing ₹ 10,000 (accumulated depreciation ₹ 3000) was sold for ₹ 5000.
- (ii) Provision for depreciation against machinery on 1.1.04 was ₹ 25,000 and on 31.12.04 was ₹ 40,000.
- (iii) Net profit for the year was ₹ 45,000.

**Solution:**

### Statement of Changes in Working Capital

<i>Particulars</i>	<i>2003</i>	<i>2004</i>	<i>Change in</i>	
			<i>Increase</i>	<i>Decrease</i>
A. Current Assets				
Cash	10,000	7000	—	3000
Debtors	30,000	50,000	20,000	
Stock	35,000	25,000		10,000
<b>Total</b>	<b>75,000</b>	<b>82,000</b>		
B. Current Liabilities				
Creditors	40,000	44,000		4000
<b>Total</b>	<b>40,000</b>	<b>44,000</b>		
Working capital (A – B)	35,000	38,000		
Increase in Working Capital	3000			<b>3000</b>
	<b>38,000</b>	<b>38,000</b>	<b>20,000</b>	<b>20,000</b>

**Provision for Depreciation on Machinery**

Dr.

Cr.

		By Balance b/d	25,000
To Machinery A/c	3000	By P&L Adjustment A/c	18,000
To Balance c/d	40,000		
	<b>43,000</b>		<b>43,000</b>

**Machinery A/c**

Dr.

Cr.

To Balance b/d	1,05,000	By Provision for Depreciation	3000
(80,000 + 25,000)		By Sale of Machinery	5000
		By Loss on sale of machinery	2000
		By Balance c/d (55,000 + 40,000)	95,000
	<b>1,05,000</b>		<b>1,05,000</b>

**Working Notes:**

Calculation of profit or loss on sale of machinery

Original cost	=	10,000
Less: Depreciation	=	<u>3000</u>
		7000
Less: Sale value		<u>5000</u>
Loss on sale		<u>2000</u>

**Equity Share Capital A/c**

Dr.

Cr.

To Drawings	17,000	By Balance b/d	1,25,000
To Balance c/d	1,53,000	By Issue of Shares-Cash	45,000
	<b>1,70,000</b>		<b>1,70,000</b>

**Loan from PNB A/c**

Dr.

Cr.

		By Balance b/d	40,000
To Balance c/d	50,000	By loan taken	10,000
	<b>50,000</b>		<b>50,000</b>

### Goodwill A/c

Dr.			Cr.
To Balance b/d	1,15,000	By Goodwill written off	25,000
		By Balance c/d	90,000
	<b>1,15,000</b>		<b>1,15,000</b>

### Land A/c

Dr.			Cr.
To Balance b/d	40,000		
To Purchase	10,000	By Balance c/d	50,000
	<b>50,000</b>		<b>50,000</b>

### Building A/c

Dr.			Cr.
To Balance b/d	35,000		
To Purchase	25,000	By Balance c/d	60,000
	<b>60,000</b>		<b>65,000</b>

### Adjusted Profit and Loss A/c

Dr.			Cr.
To Depreciation on machinery	18,000	By Fund From Operation	65,000
To loss on sale of machinery	2000		
To Balance c/d (Net Profit)	45,000		
	<b>65,000</b>		<b>65,000</b>

### Fund Flow Statement

Sources	Amt. (₹)	Applications	Amt. (₹)
Loan from PNB	10,000	Drawings	17,000
Sale of Machinery	5000	Loan repaid	25,000
Fund From Operation	65,000	Purchase of machinery	10,000
		Purchase of building	25,000
		Increase in working capital	3000
	<b>80,000</b>		<b>80,000</b>

10. From the Balance Sheet of Sunshine Hotels Ltd., as on 31.12.2003 and 31.12.2004 is as follows. Prepare:

- (i) Statement of changes of working capital
- (ii) Fund flow statement

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Share Capital	12,00,000	16,00,000	Plant & Machinery	8,00,000	12,90,000
Debentures	4,00,000	6,00,000	Land & Building	6,00,000	8,00,000
P&L A/c	2,50,000	5,00,000	Stock	6,00,000	7,00,000
Creditors	2,30,000	1,80,000	Bank	40,000	80,000
Provision for bad debts	12,000	6000	Preliminary Expenses	14,000	12,000
Provision for depreciation on land and building	40,000	48,000	Debtors	1,38,000	1,22,000
Provision for depreciation on Plant & Machinery	60,000	70,000			
	<b>21,92,000</b>	<b>30,04,000</b>		<b>21,92,000</b>	<b>30,04,000</b>

Additional information:

- (i) During the year, a part of the machinery costing ₹ 1,40,000 (accumulated depreciation ₹ 4000) was sold for ₹ 12,000.
- (ii) A dividend of ₹ 1,00,000 was paid during the year.

**Solution:**

### Statement of Changes in Working Capital

<i>Particulars</i>	<i>2003</i>	<i>2004</i>	<i>Change in</i>	
			<i>Increase</i>	<i>Decrease</i>
A. Current Assets				
Stock	6,00,000	7,00,000	1,00,000	
Bank	40,000	80,000	40,000	
Debtors	1,38,000	1,22,000		16,000
<b>Total</b>	<b>7,78,000</b>	<b>9,02,000</b>		
B. Current Liabilities				
Creditors	2,30,000	1,80,000	50,000	
Provision for doubtful debts	12,000	60,000	6000	
<b>Total</b>	<b>2,42,000</b>	<b>1,86,000</b>		
Working Capital (A – B)	5,36,000	7,16,000		
Increase in Working Capital	1,80,000			<b>1,80,000</b>
	<b>7,16,000</b>	<b>7,16,000</b>	<b>1,96,000</b>	<b>1,96,000</b>

**Provision for Depreciation on Machinery**

Dr.

Cr.

		By Balance b/d	60,000
To Machinery A/c	4000	By P&L Adjustment A/c	14,000
To Balance c/d	70,000		
	<b>74,000</b>		<b>74,000</b>

**Machinery A/c**

Dr.

Cr.

To Balance b/d	8,00,000	By Provision for Depreciation	4000
To Purchase	6,30,000	By Sale of Machinery	12,000
		By Loss on sale of machinery	1,24,000
		By Balance c/d	12,90,000
	<b>14,30,000</b>		<b>14,30,000</b>

**Working Notes:**

Calculation of profit or loss on sale of machinery

Original cost = 1,40,000

Less: Depreciation = 4000

1,36,000

Less: Sale value 12,000Loss on sale 1,24,000**Equity Share Capital A/c**

Dr.

Cr.

		By Balance b/d	12,00,000
To Balance c/d	16,00,000	By Issue of Shares-Cash	4,00,000
	<b>16,00,000</b>		<b>16,00,000</b>

**Debentures A/c**

Dr.

Cr.

		By Balance b/d	4,00,000
To Balance c/d	6,00,000	By Issue of debentures	2,00,000
	<b>6,00,000</b>		<b>6,00,000</b>

**Provision for Depreciation on Land and Building A/c**

Dr.

Cr.

		By Balance b/d	40,000
To Balance c/d	48,000	By Profit & Loss A/c	8000
	<b>48,000</b>		<b>48,000</b>

**Land and Building A/c**

Dr.

Cr.

To Balance b/d	6,00,000		
To Purchase	2,00,000	By Balance c/d	8,00,000
	<b>8,00,000</b>		<b>8,00,000</b>

**Preliminary Expenses A/c**

Dr.

Cr.

To Balance b/d	14,000	By P&L Adjustment A/c	2000
		By Balance c/d	12,000
	<b>14,000</b>		<b>14,000</b>

**Adjusted Profit and Loss A/c**

Dr.

Cr.

To Depreciation on Building	8000	By Balance b/d	4,98,000
To Depreciation on Machinery	14,000	By Funds From Operation	2,50,000
To Loss on sale of machinery	1,24,000		
To Preliminary Expenses written off	2000		
To Dividend	1,00,000		
To Balance c/d	5,00,000		
	<b>7,48,000</b>		<b>7,48,000</b>

**Fund Flow Statement**

<i>Sources</i>	<i>Amt. (₹)</i>	<i>Applications</i>	<i>Amt. (₹)</i>
Issue of Shares	4,00,000	Purchase of Building	2,00,000
Issue of Debentures	2,00,000	Dividend paid	1,80,000
Sale of Machinery	12,000	Purchase of machinery	1,00,000
Funds From Operation	4,98,000	Increase in working capital	6,30,000
	<b>11,10,000</b>		<b>11,10,000</b>



### Objective Type Questions

*Fill in the blanks:*

- (a) Fund flow refers to change in \_\_\_\_\_ capital.
- (b) Stock at end results in the \_\_\_\_\_ of funds.
- (c) Depreciation is treated as \_\_\_\_\_ of funds.
- (d) Building sold on credit is \_\_\_\_\_ of funds.
- (e) Commission outstanding is \_\_\_\_\_ of funds.

### Review Questions

1. What is meant by fund?
2. What is meant by fund flow?
3. What is a fund flow statement?
4. What are the objectives of fund flow statement?
5. What are advantages of fund flow statement?
6. What are the limitations of fund flow statement?
7. What is meant by Schedule of changes in working capital?

### Exercises

1. Calculate fund from operations from the following information.

P&L A/c (Credit Balance)	30,500
Transfer to General Reserve	10,000
Depreciation	14,000
Provision for taxation	25,000
Dividend paid	20,000
Profit for the year	30,600

2. Prepare the statement showing changes in Working Capital from the following Balance Sheet:

<i>Liabilities</i>	<i>1999</i>	<i>2000</i>	<i>Assets</i>	<i>1999</i>	<i>2000</i>
Equity Share Capital	8,00,000	8,00,000	Long term investments	6,88,000	5,80,000
Preference Share Capital	4,00,000	4,00,000	Stock		
Debenture	3,70,000	4,40,000	Finished Goods	1,50,000	1,20,000
Sundry Creditors	96,000	1,00,000	Raw materials	80,000	60,000
Outstanding Expenses	35,000	45,000	Work in progress	70,000	80,000

*Contd.*

Bills Payable	10,000	15,000	Debtors	75,000	84,000
Dividend Payable	40,000	20,000	Cash in hand	50,000	40,000
			Cash at bank	38,000	56,000
	<b>17,51,000</b>	<b>18,20,000</b>		<b>17,51,000</b>	<b>10,82,000</b>

3. From the following two Balance Sheets as on 31.12.2005 and 31.12.2006, you are required to prepare a fund flow statement with a supporting schedule of working capital:

<i>Particulars</i>	<i>2005 (₹)</i>	<i>2006 (₹)</i>
<b>Assets</b>		
Bank Balance	2,00,000	1,50,000
Sundry Debtors	50,000	75,000
Closing Stock	50,000	75,000
Land and Building	9,00,000	10,00,000
	<b>12,00,000</b>	<b>13,00,000</b>
<b>Capital and Liabilities</b>		
Share Capital	10,00,000	10,50,000
Sundry Creditors	50,000	40,000
Profit & Loss Account	1,50,000	2,10,000
	<b>12,00,000</b>	<b>13,00,000</b>

4. The Balance Sheet of X Ltd. as on 31st March 2003 and 2004 stood as below:

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Equity Share Capital	3,00,000	4,00,000	Land & Building	3,00,000	3,10,000
Preference Share Capital	2,00,000	1,00,000	Machinery	2,50,000	2,00,000
Profit & Loss A/c	1,40,000	1,70,000	Stock	90,000	1,30,000
Creditors	53,000	90,000	Debtors	60,000	1,10,000
Bills Payable	24,000	46,000	Cash	18,000	11,000
Outstanding Expenses	1000	5000	Short-term investments		50,000
	<b>7,18,000</b>	<b>8,11,000</b>		<b>7,18,000</b>	<b>8,11,000</b>

Additional information:

- (i) Depreciation on building ₹ 15,000
- (ii) Machinery depreciation ₹ 25,000

Prepare schedule of changes in working Capital and fund flow statement.

5. From the Balance Sheet of Apollo Ltd., prepare:

- (i) Statement of changes in working capital
- (ii) Fund flow statement

<i>Liabilities</i>	<i>2003</i>	<i>2004</i>	<i>Assets</i>	<i>2003</i>	<i>2004</i>
Equity Share Capital	3,00,000	4,00,000	Goodwill	1,15,000	90,000
Preference Share Capital	1,50,000	1,00,000	Land & Building	2,00,000	1,70,000
General Reserve	40,000	70,000	Plant & Machinery	80,000	2,00,000
Profit & Loss A/c	30,000	48,000	Debtors	1,60,000	2,00,000
Proposed Dividend	42,000	50,000	Stock	77,000	1,09,000
Creditors	55,000	83,000	Bills Receivable	20,000	30,000
Bills Payable	20,000	16,000	Cash in hand	15,000	10,000
Provision for tax	40,000	50,000	Cash at bank	10,000	8000
	<b>6,77,000</b>	<b>8,17,000</b>		<b>6,77,000</b>	<b>8,17,000</b>

Additional information:

- (i) Depreciation of ₹ 10,000 and ₹ 20,000 on Plant and land and building respectively.
- (ii) An interim dividend of ₹ 20,000 has been paid in 2004.
- (iii) Income tax of ₹ 35,000 has been paid.

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