UNIT 1 ACCOUNTING AND ITS FUNCTIONS

Structure **Page Nos.**

1.0 INTRODUCTION

Accounting is often called the language of business. The basic function of any language is to serve as a means of communication. In this context, the purpose of accounting is to communicate, or report the results of business operations and its various aspects. Though accounting has been defined in various ways. According to one commonly accepted definition, "Accounting is the art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events which are, in part at least, of financial character and interpreting the results thereof ". Another definition which is less restrictive interprets accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgements and decisions by the users of information".

1.1 OBJECTIVES

After studying the unit, you should be able to:

- the nature and role of accounting;
- the activities of an accountant; and
- the roles of accounting personnel and the accounting function in an organisation.

1.2 THE SCOPE OF ACCOUNTING

The scope of accounting can be presented in a diagrammatic form as shown in *Figure 1.1*.

Data creation and collection is the area which provides the necessary inputs for accounting system. The data collected is related to economic and financial transactions and 'historic' in the sense that it refers to transactions which have already taken place. Earlier, accounting was largely concerned with what had happened, rather than making any attempt to predict, and prepare for future.

After the historic data has been collected and related to various transactions, it is recorded in accordance with generally accepted accounting theory. All transactions or

events have to be entered in the books of original entry (journals) and ledgers in accordance with the classification scheme already decided upon. The recording and processing of information usually accounts for a substantial part of total accounting work. This type of activity in accounting may be called **recordative.** The methods employed for recording may be manual, mechanical or electronic. Computers are also used widely in modern business for doing job.

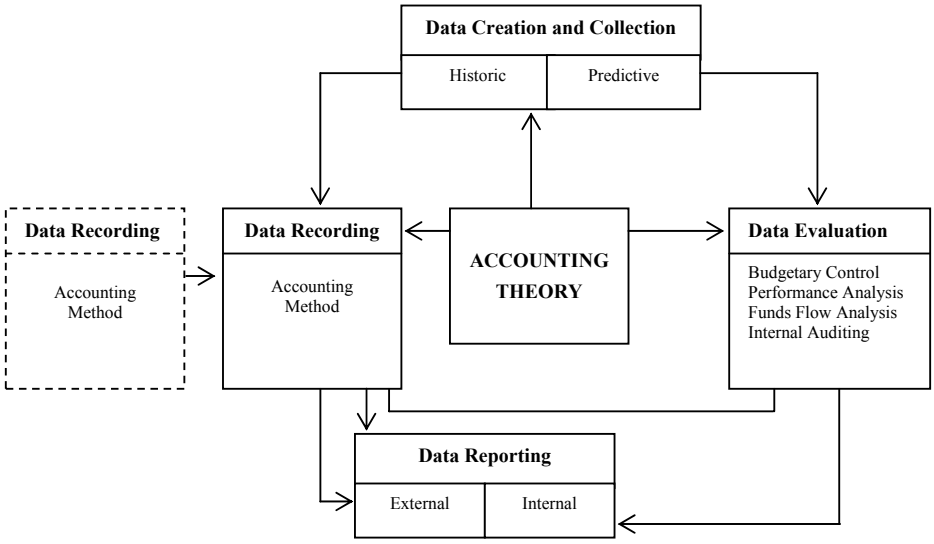

Figure 1: Scope of Accounting

Data evaluation is regarded as the most important activity in accounting these days. Evaluation of data includes controlling the activities of business with the help of budgets and standard costs (budgetary control), evaluating the performance of business, analysing the flow of funds, and analysing the accounting information for decision-making purposes by choosing among alternative courses of action.

The **analytical and interpretative** work of accounting may be for internal or external uses and may range from snap answers to elaborate reports produced by extensive research. Capital project analysis, financial forecasts, budgetary projections and analysis for reorganization, takeover or merger often lead to research-based reports.

Data evaluation has another dimension and this can be known as the **auditive** work which focuses on verification of transactions as entered in the books of account and authentication of financial statements. This work is done by public professional accountants. However, it has become common these days for even medium-sized organisations to engage internal auditors to keep a continuous watch over financial flows and review the operation of the financial system.

Data reporting consists of two parts-external and internal. External reporting refers to the communication of financial information (viz., earnings, financial and funds position) about the business to outside parties, e.g., shareholders, government agencies and regulatory bodies of the government. Internal reporting is concerned with the communication of results of financial analysis and evaluation to management for decision-making purposes.

You will note that **accounting theory** has been shown in the center of the diagram. We will turn to the role of accounting theory in the next unit.
The central purpose of accounting is to make possible the periodic matching of costs (efforts) and revenues (accomplishments). This concept is the nucleus of accounting theory. However, accounting is moving away from its traditional procedure-based record-keeping function to the adoption of a role which emphasises its importance for various managerial decisions.

☞ Check Your Progress 1

List the various accounting activities that your organisation is undertaking. Can you ascribe any particular reason as to why your organisation is undertaking these accounting activities?

Accounting Activity	**Reason**
1 ……	1 …….
2 ……...	2 …….
3 ……...	3 …….
4 ……	4 …….
5 ……	5 …….
6 ……	6 …….
7 ……	7 …….
8 ……...	8 …….

1.3 THE EMERGING ROLE OF ACCOUNTING

The history of accounting indicates the evolutionary pattern which reflects changing socio-economic conditions, and the enlarged purposes to which accounting is applied. In the present context, four phases in the evolution of accounting can be distinguished.

Stewardship Accounting

In earlier times in history, wealthy people employed 'stewards' to manage their property. These stewards rendered an account of their stewardship to their owners periodically. This notion lies at the root of financial reporting even today which essentially involves the orderly recording of business transactions, commonly known as 'book-keeping'. Indeed, the accounting concepts and procedures in use today for systematic recording of business transactions have their origin in the practices employed by merchants in Italy during the 15th century. The Italian method which specifically began to be known as 'double entry book-keeping' was adopted by other European countries during the 19th century. Stewardship accounting, in a sense, is associated with the need of business owners to keep records of their transactions, the property and tools they owned, as well as the debts they owed, and the debts others owed them.

Financial Accounting

Financial accounting dates from the development of large-scale business and the advent of the Joint Stock Company. This form of business which enables the public to participate in providing capital in return for shares in the assets and the profits of the company. This form of business organisation permits a limit to the liability of their members to the nominal values of their shares. This means that the liability of a shareholder for the financial debts of the company is limited to the amount he had agreed to pay on the shares he bought. He is not liable to make any further contribution in the event of company's failure or liquidation. As a matter of fact, the law governing the operations (or functioning) of a company in any country (for instance, the Companies Act in India) gives a legal form to the doctrine of stewardship which requires that information be disclosed to the shareholders in the form of annual income statement and balance sheet such statements are generally known as annual financial statements.

Briefly speaking, the income statement is a statement of profit and loss made during the year of the report; and the balance sheet indicates balances of the assets held by the firm and the monetary claims against the firm as on a particular date. The general unwillingness of the company directors to disclose more than the minimum information required by the law, and the growing public awareness have forced the governments in various countries of the world to extend the disclosure (of information) requirements.

The importance attached to financial accounting statements can be traced to the need of the society to mobilise savings, and channel them with profitable investments. Investors, whether they are large or small, must be provided with reliable and sufficient information in order to be able to make sound investment decisions. This is the most significant social purpose of financial accounting.

Cost Accounting

The industrial revolution in England presented a challenge to the development of accounting as a tool of industrial management. Costing techniques were developed as guides to management actions. The increasing awareness on the part of entrepreneurs and industrial managers of the benefits of using scientific principles of management in the wake of scientific management movement led to the development of cost accounting. Cost accounting is concerned with the application of costing principles, methods and techniques to ascertain the costs with a view to controlling them, and assessing the profitability and efficiency of the enterprise.

Management Accounting

The advent of management accounting was the next logical step in the developmental process. The practice of using accounting information as a direct aid to management is a phenomenon of the 20th century, particularly the last 30-40 years. The genesis of modern management, with its emphasis on detailed information on decision-making, provided a tremendous impetus to the development of management accounting.

Management accounting is concerned with the preparation and presentation of accounting and controlling information in a form which assists management in the formulation of policies, and in decision-making on various matters connected with routine and/or non-routine operations of business enterprise. It is through the techniques of management accounting that managers are supplied with information that they need for achieving objectives for which they are accountable. Management accounting has, thus, shifted the focus of accounting from recording and analysing financial transactions, to using information for decisions affecting the future. In this sense, management accounting has a vital role to play in extending the horizons of modern business. While the reports emanating from financial accounting, specially for outsiders, are subject to the conceptual and legal framework of accounting, internal reports–routine or non-routine–are free from such constraints.

Social Responsibility Accounting

Social responsibility accounting is a new phase in the development of accounting and owes its birth to increasing social awareness which has been particularly noticeable over the last two decades or so. Social responsibility accounting widens the scope of accounting by considering the social effects of business decisions, in addition to the economic effects. Several social scientists, statesmen, and social workers all over the world have been drawing the attention of their governments and the people in their countries to the danger posed to environment and ecology by unbridled industrial growth. The role of business in society is increasingly coming under greater scrutiny. The management is being held responsible not only for efficient conduct of business as expressed in profitability, but also for what it contributes to social well being and progress. There is a growing feeling that the concepts of growth and profit as measured in traditional balance sheets and income statements are too narrow to reflect the social responsibility aspects of a business.

Human Resource Accounting

Way back in 1964, the first attempt to include figures on human capital in the balance sheet was made by Hermansson which later came to be known as Human Resource Accounting (HRA). However there has been a great socio-economic shift in the 1990s with the emergence of the knowledge economy, a distinctive shift towards recognition of human and intellectual capital in contrast to physical capital. Human Resource Accounting is a branch of accounting which seeks to report and emphasis the importance of human resources (knowledgeable, trained, loyal and committed employees) in a company's earning process and total assets. It is concerned with "the process of identifying and measuring data about human resources and communicating this information to interested parties". In simple words, it involves accounting for investment in people and their replacement costs, as well as accounting for the economic values of people to an organisation. Generally, the methods used for the valuing and accounting of human resources are either based on costs, or on economic value of human resources. However, providing adequate and valid information on human assets (capital), which are outside the concept of ownership, in figures is very difficult. Nevertheless HRA is a managerial tool providing valuable information to the top management to take decisions regarding adequacy of human resources, and thus, encouraging managers to consider investment in manpower in a more positive way.

Inflation Accounting

Inflation Accounting is concerned with the adjustment in the value of assets (current and fixed) and of profit in the light of changes in the price level. In a way, it is concerned with the overcoming of limitations that arise in financial statements on account of the cost assumption (that is, recording of the assets at their historical, or original cost) and the assumption of stable monetary unit (these are discussed in detail in the next unit). It thus aims at correcting the distortions in the reported results caused by price level changes. Generally, rising prices during inflation have the distorting influence of overstating the profit. Various approaches have been suggested to deal with this problem in inflation accounting.

If this little introduction of HRA and Inflation accounting provokes you to know more about them, we suggest that you listen to the audio programme "**Emerging Horizons in Accounting and Finance-Part II and III"** which deal with these two topics. You may also read "Money Measurement Concept" and "Cost Concept" explained in the next unit which has a bearing on inflation accounting.

☞ Check Your Progress 2

In the context of your organisation, describe some of the cost and management accounting related activities. Please also identify any particular accounting practice in the area of social responsibility.

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1.4 ACCOUNTING AS AN INFORMATION SYSTEM

While discussing the scope of accounting, you must have observed that accounting involves a series of activities linked with each other, beginning with collecting, recording, analysing and evaluating the data, and finally communicating information to its users. Information has no meaning unless it is linked to a certain purpose. It seems that accounting looks like a system that undertakes processing of collected data to generate necessary information for certain purpose.

Accounting as a social science can be viewed as an information system since it has all the features of a system. It has its inputs (raw data), processes (men and equipment), and outputs (reports and information). If we consider accounting as an information system, then we are in a position to make some important observations. First, the goal of the system is to provide information which meets the needs of its users. If we can correctly identify the needs of the users, we are then able to specify the nature and character of the outputs of the system. Second, it is the output requirements that determine the type of data that would be selected as inputs for processing into information output.

There are several groups of people who have a stake in a business organisation–managers, shareholders, creditors, employees, customers, etc. Additionally, the community at large has economic and social interests in the activities of such organisations. Such interests are expressed at the national level by the concerns of Government in various aspects of the firms' activities, such as their economic well-being, their contribution to welfare, their part in the growth of the national product, to mention only a few examples.

We shall now briefly discuss what the information needs of various users of accounting are.

Shareholders and Investors: Since shareholders and other investors have invested their wealth in a business enterprise, they are interested in knowing periodically about the profitability of the enterprise, the soundness of their investment and the growth prospects of the enterprise. Historically, business accounting was developed to supply information to those who had invested their funds in business enterprises.

Creditors: Creditors may be short-term or long-term lenders. Short-term creditors include suppliers of materials, goods or services. They are normally known as trade creditors. Long-term creditors are those who have lent money for a long period, usually in the form of secured loans. The main concern of the creditors is focused on the credit worthiness of the firms and its ability to meet its financial obligations. They are, therefore, concerned with the liquidity of the firms, its profitability and financial soundness. In other words, it can also be stated that creditors are interested mainly in information which deals with solvency, liquidity, and profitability so that they can assess the financial standing of the firm.

Employees: The view that business organisations exist to maximise the return to shareholders has been undergoing change as a result of social changes. A broader view is taken today of the economic and social role of management. The importance of harmonious industrial relations between management and employees cannot be overemphasised. The fact that the employees have a stake in the outcomes of several managerial decisions is recognised. Greater emphasis is on industrial democracy through employee participation in management decisions has important implications for the supply of information to employees. Matters like the settlement of wages, bonus, and profit sharing rest on adequate disclosure of relevant facts.

Government: In a mixed economy it is considered to be the responsibility of the Government to direct the operations of the economic system in such a manner that it subserves the common good. Controls and regulations on the operations of private sector enterprises are the hallmark of a mixed economy. Several Government agencies collect information about various aspects of the activities of business organisations. Much of this information is a direct output of the accounting system, for example, levels of outputs, profits, investments, costs, and taxes. All this information is very important in evolving policies for managing the economy. The task of the Government in managing the industrial economy of the country is facilitated if accounting information is presented, as far as possible, in a uniform manner. It is clear that if accounting information is distorted due to manipulations and window-dressing in the presentation of annual accounts, it will have ill-effects on the measures the Government intends to take, and the policies it wishes to adopt.

Management: Organisations may or may not exist for the sole purpose of profit. However, the information needs of the managers of both kinds of organisations are almost the same, because the managerial processes, i.e., planning, organising, and controlling are the same. All these functions have one thing in common, and it is that they are all concerned with making decisions which have their own specific information requirements. The emphasis on efficient and effective management of organisations has considerably extended the demand for accounting information. The role of accounting, as far as management is concerned, was highlighted earlier when we discussed about management accounting.

Consumers and others: Consumers' organisations, media, welfare organisations, and the public at large are also interested in accounting information in order to appraise the efficiency and social role of the enterprises in different sectors of the economy, that is, what levels of profits and outputs are being achieved, in what way the social responsibility is being discharged, and in what manner growth is being planned by the enterprises, in accordance with the national priorities.

The above discussion, perhaps, has indicated to you that the information needs of various users may not necessarily be the same. Sometimes, they may even conflict and compete with each other. In any case, the objective of accounting information is to enable information users to make optimum decisions.

1.5 THE ROLE AND ACTIVITIES OF AN ACCOUNTANT

Having discussed the scope of accounting and its emerging role, we are now in a position to describe who is an accountant. In an attempt to answer this question, we reproduce below some statements in this regard:

a) An accountant is one who is engaged in accounts keeping.
b) An accountant is a functionary who aids control.
c) An accountant keeps the conscience of an organisation.
d) An accountant is a professional whose primary duties are concerned with information management for internal and external use.
e) An accountant is a fiscal adviser.
f) An accountant produces an income statement and a balance sheet for an accounting period, and maintains all supporting evidence and classified facts that lead to the final accounting statements.
g) An accountant verifies, authenticates, and certifies the accounts of an entity.
h) An accountant provides necessary information for various managerial decisions.

Tell us your reactions about the above statements. Perhaps you do have your own ideas, but our thinking is that each of the foregoing statements contains some truth in

it as it highlights some aspects of the functions of an accountant. Except for one statement which presents a somewhat competitive view, can you identify this statement? We will help you in doing this.

Statement (a) defines a person who maintains accounts. Statement (f) echoes almost a similar motion, but extends his role to the production of financial statements. The work implied in these statements is that of score-keeping and the person performing such activity is known as a financial accountant (or maintenance accountant).

Statements (b) and (h) are about the role which an accountant can play in the decision-making and the management control process. It is concerned with attention-directing and problem-solving. The functionary may be designated as management accountant (or controller, as in the United States).

Statement (e) underlines a narrow, specific role of an accountant, though of critical significance. In view of the high incidence of taxes on business in India, tax planning assumes a vital role in fiscal management. By planning the operations of the enterprise in a particular manner, the tax adviser attempts to minimise the liability of the firm by availing the concessions and incentives provided for in the applicable tax laws.

Statement (g) stresses the 'audit', 'watchdog', or 'certification role' of the accountant who is not an employee of a business but who performs an external verification of accounts. Such a functionary is a trained and qualified professional who, like any other professional, has an educational status and prescribed code of conduct. Chartered Accountants in India, England-Wales, and Certified Public Accountants in USA belong to this category of accountants.

Statement (c) presents the accountant as a conscience- keeper. He is seen as a person whose mission is to protect and promote the interest of the employer in a positive manner. He is there to see to it that none of the staff of the organisation carries on this work in an unethical way, or in a manner prejudicial to the long-term legitimate interests of the firm.

We are now left with statement (d) which defines an accountant as a professional and underlines his pre-occupation with management of information for internal use (management accounting function) and for external use (financial accounting function). We are sure our discussion of accounting as an information system has made it easier for you to comprehend this role of the accountant. We may clarify that information management is not necessarily associated with the sophisticated (or hi-tech) area of computers. Small firms may 'manage' information without a substantial degree of mechanisation, or automation. Often, the role of accounting in small business is not properly recognised. It is widely known that a large number of small businesses fail and do not survive beyond a few years. One of the main reasons for the failure is that they do not have adequate information system, to help their managers to control costs, to forecast cash needs, and to plan growth. Organisations which have poor accounting systems often find it considerably difficult to obtain finance from banks and other outside investors.

1.6 ACCOUNTING PERSONNEL

There is hardly any organisation which does not have an accountant. His role is all pervasive, and he is involved in a wide range of activities, particularly in a large and complex organisation. The exact duties of an accountant might differ in different organisations. However, a broad spectrum of responsibilities can be identified.

The accountants can be broadly divided into two categories, those who are in public practice, and those who are in private employment. The accountants in public practice

offer their services for conducting financial and/or cost audit. As such, they are known as auditors. The auditor examines the books of account and reports on the balance sheet and profit and loss account of the company as to whether they give a true and fair view of the state of affairs of the company and its profit respectively. The auditor in a company is appointed by the shareholders to whom s/he reports. Public accountants are generally members of professional bodies like the Institute of Chartered Accountants of India. In addition to conducting a financial or cost audit (in accordance with the requirements of, say, the Companies Act), as the case may be, they may also provide advisory services for designing, or improving accounting and management control systems.

Accountants in employment may be in various business, or non-business organisations to perform a variety of accounting and management control functions. Accountants at higher levels generally belong to professional accounting bodies, but those who are at lower levels need not be so. Accounting chiefs in different organisations, depending upon their nature of work, are variously designated as finance officers, or internal auditors, or chiefs accounts officers, etc. The term 'controller' as the head of the accounting and finance function is not very popular in India, but of late, it is catching on. Several large organisations, both in the public and private sectors, have controllers. Let us get an idea of who these people are, and what they do.

Internal Auditor: An Internal Auditor is an employee of an organisation in contrast to an external auditor who is paid a fee for his services. An external auditor is not an employee of a company, and he is appointed to conduct what is known as statutory audit. The internal auditor is responsible for performing monitoring activities, and other services, including designing and operating the system of internal control, auditing the data reported to the directors of the company, and assisting external auditors. The head of the internal audit function reports directly either to the chief executive or to the audit committee of the Board of Directors.

Internal audit includes continuous verification of entries appearing in the books of account with the original vouchers and proper accounting assets. Further, it attempts to ensure that the policies and procedures regarding financial matters are being complied with. Internal auditing is also concerned with administering the system of **internal checks** so that mistakes, innocent or intentional, are prevented from taking place.

We should distinguish an internal auditor from an external auditor. While an internal auditor devotes his entire time and energy to the needs of one company (i.e., his employer), an external auditor serves many clients. The primary function of the external auditor, as pointed out earlier, is to safeguard the interests of the shareholders (by whom he is appointed) by an independent and impartial appraisal of the financial transactions of the company so that he could report on the net profit earned by the company and its financial position. His role is that of an objective outsider, expressing expert opinions to the financial condition and operating results of the client's business. Apart from shareholders, other parties such as banks, lending institutions, Government agencies, etc. rely on the fairness of such financial reports in making certain decisions about a given company. An auditor is bound by a set of professional regulations which include an examination on technical competence and adherence to a code of ethical conduct.

Controller: This is the other name for Chief Accountant and s/he is usually the head of the whole area of accounting, including internal audit. S/he is overall in-charge of all activities comprising financial accounting, cost accounting, management accounting, tax accounting, etc. S/he exercises authority both for accounting within the organisation and for external reporting. The external reports include reports to Government revenue collecting and regulatory bodies, such as the Company Law

Board and the Income Tax Department. S/he may also supervise the company's internal audit and control systems. In addition to processing historical data, s/he is expected to supply a good deal of accounting information to top management concerning future operations, in line with the management's planning and control needs. Besides, s/he is also expected to supply detailed information to managers in different functional areas (like production, marketing, etc.) and at different levels of the organisation, so as to assist them in decision-making.

We may enumerate the functions of the controller as follows:

a) Designing and operating the accounting system
b) Preparing financial statements and reports
c) Establishing and maintaining systems and procedures
d) Supervising internal auditing and arranging for external audit
e) Supervising computer applications
f) Overseeing cost control
g) Preparing budgets
h) Making forecasts and analytical reports
i) Reporting financial information to top management
j) Handling tax matters and ensure other legal compliances.

Treasurer: S/he is the custodian and manager of all the cash and near-cash resources of the firm. The treasurer handles credit reviews and sets policy for collecting receivables (debtors of the firm, to whom the firm has sold goods or services on credit). S/he also handles relationships with banks, and other lending or financial institutions.

The Financial Executive Institute (USA) makes the following distinction between controllership and treasureship functions:

Controllership	**Treasurership**
Planning and Control	Provision of Capital
Reporting and Interpreting	Investor relations
Evaluating and Consulting	Short-term Financing
Tax Administration	Banking and Custody
Government Reporting	Credit and Collections
Protection of Assets	Investment
Economic Appraisal	Insurance

Finance Officer: Finance is the lifeblood of business. Procuring financial resources and ensuring their judicious utilisation are the two important activities of financial management. Financial management includes four major decisions: investment decision, financing decision, dividend decision, and working capital decision. Investment decision is perhaps the most important decision, because it involves allocation of resources. It is concerned with the future which, being uncertain, involves risk. How the firm is allocating its scarce resources and is planning growth will largely determine its value in the market place. Financing decision is concerned with determining the optimum financing mix, or capital structure. It examines the various methods by which a firm obtains short-term and long-term finances through various alternative sources. The dividend decision is concerned with questions such as, how much of the profit is to be retained, and how much is to be distributed as dividends. For the smooth running of a firm, we need some amount of working capital, and working capital decisions are concerned with ensuring the optimum amount and mix of working capital. The finance manager has to strike a balance between the current needs of the enterprise for cash, and the needs of the shareholders for adequate return. The financial management of a large company is usually the responsibility of the finance director who may be in place of, or in addition to the

controller. Often the finance manager and controller are inter-changeable terms, and only one of these tow positions may be found in a company. The finance manager, when there is a controller also in the organisation, is concerned with implementing the financial policy of the board of directors, managing liquidity, preparation of budgets and administration of budgetary control system, managing profitability, etc.

Though financial management is regarded as a separate area, this function is performed in several countries, including in India, by the accountant (or the financial controller). Several large organisations, however, have a financial executive besides the chief accountant. Often, finance and accounting functions are clubbed together in one person, in small organisations.

☞ Check Your Progress 3

Please meet one, or more, of the following personnel in any organisation, and talk to them about their respective roles within the organisation.

Accountant

1 ……

2 ……

3 ……

4 ……

5 ……

Chief Accountant

1 ……

2 ……

3 ……

4 ……

5 ……

Controller

1 ……

2 ……

3 ……

4 ……

5 ……

Finance Manager

1 ……

2 ……

3 ……

4 ……

5 ……

Internal Auditor

1 ……

2 ……

3 ……

4 ……

5 ……

1.7 THE NATURE OF THE ACCOUNTING FUNCTION

Accounting is a **service function.** The chief accounting executive (by whatever name he is called) holds a staff position except within his own department where he exerts authority. This is in contradiction to the roles played by production or marketing executives who hold line authority. The role of the accountant is advisory in character. S/he works through the authority of the chief executive. The accounts and or finance department(s) do not exercise direct authority over line departments. In decentralised structure with a number of units and divisions, the accounting executive, however, exercises what is known as the functional authority over all the accounting staff deployed in different segments.

There are two facets to the role of the accountant. For top managers, s/he works as a watchdog, and for middle and lower level managers s/he acts as 'helper'. The watchdog role is usually performed through the 'score-keeping' task of accounting and reporting to all levels of management. The 'helper' role is usually performed through the task of directing managers' attention to problems, and assisting them in solving problems. Mutual understanding and rapport between the accountant and the manager, in the tasks of attention-directing and problem-solving, can be enhanced if the accountant and his staff frequently interact with the line managers and guide them in matters concerned with preparation of budgets and control documents with which they might not be conversant. This will instill confidence among line managers regarding the reliability of reports.

1.8 THE ORGANISATION FOR ACCOUNTING AND FINANCE

A typical organisation chart for accounting and finance is presented in *Figure 2.* You will note that the person at the helm of affairs is the Director (Finance) who is a member of the Board of Directors. Reporting to him may be one or more General Managers. If there is only one General Manager, s/he may be designated as General Manager (Finance), or General Manager (Finance and Accounts), or Controller or Financial Controller. In a large company, four or five (as shown in *Figure 2*) the Deputy General Managers incharge of different areas like systems and data processing, accounts, finance, internal auditing may report to him/her. Following the American pattern, a tendency has recently been observed among large companies, especially in the private sector, to designate General Manager (Finance) as President (Finance, or Finance and Accounts), and a Deputy General Manager as Vice-President. Each of these Deputy General Managers is assisted by a number of senior managers who look after different components of similar activities, e.g., financial accounting, tax planning and administration, management auditing, etc. Management audit is a comprehensive review of the various sub-systems of the organisation such as objectives and goals, structure, technical system, personnel policies, (including succession planning), control and coordination policies and procedures, adequacy and effectiveness of communication system, etc. This type of audit is usually done by a

team of people comprising the internal resource persons drawn from various functional areas and an external management consultant.

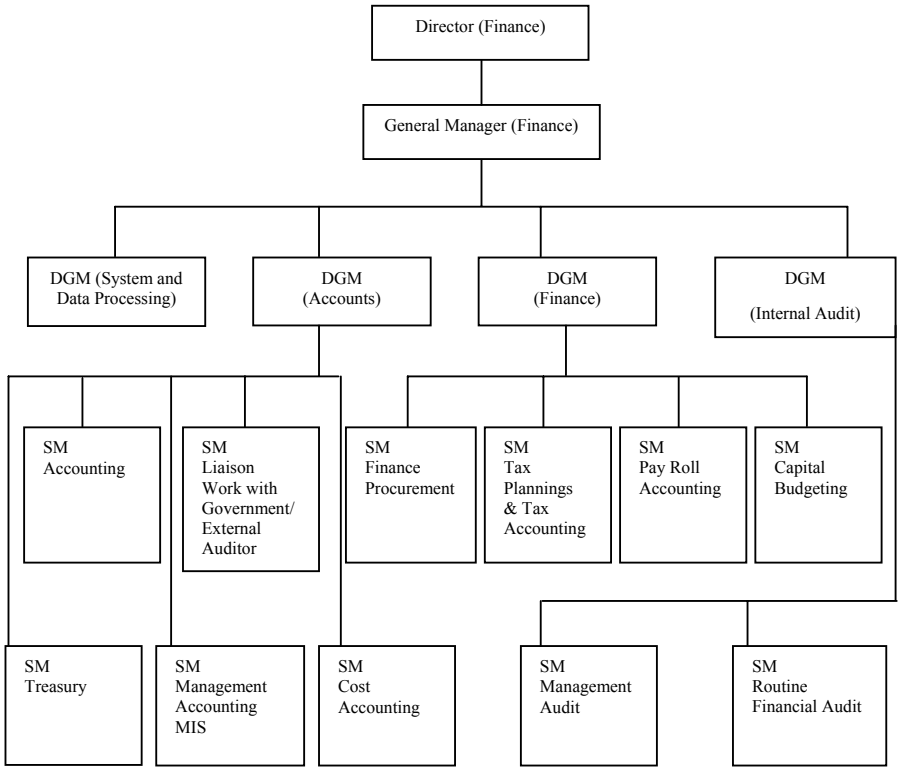

Figure 2: Organisation Chart for Accounting and Finance

We hope you now have a reasonably good idea of what accounting is, what its scope is, and what the different types of activities which are generally included in accounting. While basic functions of accounting and finance are performed in all types of organisations, their relative emphases or relevance might differ in different types of organisations. Keeping this in view, we have prepared an audio programme **"Accounting and Finance in Different Types of Organisations",** and we suggest that you listen to this tape. This will not only augment your familiarity with the basic aspects and functions of accounting, but will develop your appreciation for relative divergencies.

1.9 SUMMARY

Accounting is an important service activity in business and is concerned with collecting, recording, evaluating and communicating the results of past events. The history of accounting development reflects its changing role in response to the changing business and social needs. With the emergence of management accounting, the focus of accounting has been shifting from the mere recording of transactions to that of aiding management in decisions.

Accounting can be perceived as an information system which has its input, processing methods, and outputs. The usefulness of accounting lies in its capacity to provide information to various stakeholders in business so that they can arrive at sound decisions.

The top accounting personnel are designated by various nomenclature. The practice in this regard differs in different companies. The organisational setting for the

accounting and finance function may also vary in different organisations, depending upon their peculiarities, nature and size of business, technology, and structural form. At the helm of affairs is usually the Director of Accounts and Finance who is a member of the Board of Directors. He is assisted by a General Manager who, in turn, is helped by Deputy General Managers in charge of various sub-functions, like accounts, finance, internal audit, and data processing, etc. Each of the sub-functions is further sub-divided into activities which are the responsibility of a subordinate manager.

1.10 KEY WORDS

Accountant is a professional who is responsible for the processing of financial data for score-keeping, attention-directing, and problem solving purposes. Accounting is perceived as an Information System whose inputs are collected from various financial transactions entered into by a firm; it processes these inputs by proper classification and recording, and finally, generates output in the form of financial statements like Profit and Loss Account and Balance Sheet.

Attention-directing role of accounting consists of directing managerial attention to situations where corrective action is needed in the case of unfavourable (or even favourable) differences in operations, outputs or inputs.

Audit work of an accountant comprises authentication of accounting statements.

Control is the action that implements the planning decision, and evaluates performance.

Controller of the management accountant is a staff-functionary who uses accounting information for management planning and control.

External reporting is the production of financial statements for use by external interest groups like shareholders and Government.

Feedback comprises the performance reports which managers can use for improving their decision-making.

Information system is a system, sometimes formal and sometimes informal, for collecting, processing, and communicating data at the most relevant time to all levels of management. The data flowing through the system is helpful to managers for decision-making in the areas of planning and control, or is otherwise needed for financial reporting required under the laws. An essential requirement of the information system is feedback for needed modifications.

Planning is the identification and decision-making.

Recordative work extends to routine recording and classified posting of financial transactions and events.

Staff function is performed in an advisory capacity, and without line or decision making authority.

Store-keeping is the process of data accumulation or record-keeping which enables interested parties (internal and external) to ascertain how the organisation is performing.

1.11 SELF ASSESSMENT QUESTIONS/EXERCISES

1. "Financial Accounting is an extension of Stewardship Accounting". Comment.

2. What new developments in Accounting have taken place over the past 20-25 years? Examine the main factors which have affected such developments.

3. Pick a group of persons having interest in a business organisation, and examine the nature of their information needs.

4. Discuss the role of accountants in modern business organisation.

5. Differentiate between recordative, interpretative, and auditive functions of accounting.

6. How can accounting reports, prepared on a historical basis after the close of a period, be useful to managers in directing the activities of a business?

7. Distinguish management accounting from financial accounting.

8. How does the accountant help in the planning and control process of a large commercial organisation?

9. State whether the following statements are true or false:

   a) To have an accountant is the privilege of a joint stock company only. True ☐ False ☐

   b) A controller is entrusted with the responsibilities of raising funds. True ☐ False ☐

   c) Management control differs from engineering control since the latter is fully automatic and the former is highly complex. True ☐ False ☐

   d) An accountant is the custodian of the properties and financial interests of a business enterprise. True ☐ False ☐

Answers to Self-assessment Questions/Exercises

9. (a) False, (b) False, (c) True, (d) True,

1.12 FURTHER READINGS

Accounting Principles, Anthony, Robert N, and James S. Reece, 1987. All India Traveller Book Seller: New Delhi (Chapter I).

Accounting for Management:Text and Cases ,Bhattacharya S.K. and John Dearden, 1987. Vikas Publishing House: New Delhi. (Chapter I).

Accounting for Managers: Interpreting Accounting Information for Decision Making, Paul Collier, May 09.2003, Wiley Publishers: Canada. (Chapter I).

UNIT 2 ACCOUNTING CONCEPTS AND STANDARDS

Structure **Page Nos.**

2.0 INTRODUCTION

Any activity that you perform is facilitated if you have a set of rules to guide your efforts. Further, you find that these rules are of more value to you if they are standardised. When you are driving your vehicle, you keep to the left. You are in fact following a standard traffic rule. Without the drivers of vehicles adhering to this rule, there would be much chaos on the road. A similar principle applies to accounting which has evolved over a period of several hundred years, and during this time certain rules and conventions have come to be accepted as useful. If you are to understand and use accounting reports which is the end product of an accounting system then you must be familiar with the rules and conventions behind these reports.

2.1 OBJECTIVES

After going through this unit, you should be able to:

- appreciate the need for a conceptual framework of accounting;
- understand and appreciate the Generally Accepted Accounting Principles (GAAP), and
- develop an understanding of the importance and necessity for uniformity in accounting practices.

2.2 THE ACCOUNTING FRAMEWORK

The rules and conventions of accounting are commonly referred to as the conceptual framework of accounting. As with any discipline or body of knowledge, some underlying theoretical structure is required if a logical and useful set of practices and procedures are to be developed for reaching the goals of the profession, and for expanding knowledge in that field. Such a body of principles is needed to help answer new questions that arise. No profession can thrive in the absence of a theoretical framework. According to Hendriksen (1977), accounting theory may be defined as logical reasoning in the form of a set of broad principles that (i) provide a general frame of reference by which accounting practice can be evaluated, and (ii) guide the development of new practices and procedures. Accounting theory may also be used to explain existing practices to obtain a better understanding of them. But the

most important goal of accounting theory should be to provide a coherent set of logical principles that form the general frame of reference for the evaluation and development of sound accounting practices.

The American Institute of Certified Public Accountants (AICPA) discusses financial accounting theory and generally accepted accounting principles as follows:

Financial statements are the product of process in which a large volume of data about aspects of the economic activities of an enterprise are accumulated, analysed, and reported. This process should be carried out in accordance with generally accepted accounting principles. Generally accepted accounting principles incorporate the consensus at a particular time as to which economic resources and obligations should be recorded as assets and liabilities by financial accounting, which changes in assets and liabilities should be recorded, when these changes should be recorded, how the assets and liabilities and changes in them should be measured, what information should be disclosed and how it should be disclosed, and which financial statements should be prepared.

Generally Accepted Accounting Principles (GAAP) encompass the conventions, rules and procedures necessary to define accepted accounting practice at a particular time.....generally accepted accounting principles include not only broad guidelines of general application, but also detailed practices and procedures.

(*Source:* AICPA. Statements of the Accounting Principles Board No.4 "Basic Concept and Accounting Principles Underlying Financial Statement of Business Enterprises", October, 1970, pp.54-55).

The word 'principles' is used to mean a "general law or rule adopted or professed as a guide to action, a settled ground or basis of conduct or practice". You will note that this definition describes a principle as a **general** law or rule that is to be used as a **guide to action**. This implies that accounting principles do not prescribe exactly how each detailed event occurring in business should be recorded. Consequently, there are several matters in accounting practice that may differ from one company to another.

Accounting principles are man-made. They are accepted because they are believed to be useful. The general acceptance of an accounting principle (or for that matter, any principle) usually depends on how well it meets the three criteria of **relevance**, **objectivity**, and **feasibility**. A principle is relevant to the extent that it results in meaningful or useful information to those who need to know about a certain business. A principle is objective to the extent that the information is not influenced by the personal bias or judgement of those who furnished it. Objectivity connotes reliability or trustworthiness which also means that the correctness of the information reported can be verified. A principle is feasible to the extent that it can be implemented without undue complexity or cost.

2.3 ACCOUNTING CONCEPTS

Earlier, in unit 1, we had described accounting as the language of business. As with language, accounting has many dialects. There are differences in terminology. In dealing with the framework of accounting theory, one is confronted with a serious problem arising from differences in terminology. A number of words and terms have been used by different writes to express and explain the same idea or notion. Thus, confusion abounds in the literature insofar as the theoretical framework is concerned.

The various terms used for describing the basic ideas are: concepts, postulates, propositions, basic assumptions, underlying principles, fundamentals, conventions, doctrines, rules, etc. Although each of these terms is capable of precise definition, general usage by the profession of accounting has served to give them loose and overlapping meanings. The same idea has been described by one author as a concept and by another as a convention. To take another instance, the idea implied in

conservatism has been labelled by one author as a (modifying) convention, by another as a principle, and by yet another as a doctrine. The wide diversity in terminology to express the basic framework can only serve to confuse the learner.

Without falling into the trap of this terminological maze, we will explain below, some widely recognised ideas and we call all of these concepts. We do feel, however, that some of these ideas have a better claim to be called concepts, while the rest should be called conventions. Fundamental accounting concepts are broad, general assumptions that underlie the periodic financial accounts of business enterprises. The reason why some of these ideas should be called concepts is that they are basic assumptions and have a direct bearing on the quality of financial accounting information. The alteration of any of the basic concepts (or postulates) would change the entire nature of financial accounting.

Business Entity Concept

In accounting we make a distinction between business and the owner. All the records are kept from the viewpoint of the business, rather than from that of the owner. An enterprise is an economic unit, separate and apart from the owner, or owners. As such, transactions of the business and those of the owners should be accounted for, and reported separately. In recording a transaction, the important question is how does it affect the business? For example, if the owner of a shop were to take cash from the cash box for meeting certain personal expenditure, the accounts would show that cash had been reduced even though it does not make any difference to the owner himself. Similarly, if the owner puts cash into the business, he has a claim against the business for capital brought in.

This distinction can be easily maintained in the case of a limited company because a company has a legal entity (or personality) of its own. Like a human being, it can engage itself in economic activities of producing, owning, managing, storing, transferring, lending, borrowing and consuming commodities and services. Distinction, however, is difficult in the case of partnership, and even more so in the case of a one-man business. Nevertheless, accounting still maintains separation of business and owner. This implies that, owner's personal and household expenses or obligations (e.g., expenditure on food, clothing, housing, entertainment, debts, mortgages, etc.) will not appear in the books of account. It may be clarified that it is only for accounting purposes that partnerships and sole proprietorships are treated as separate and apart from the owners though the law does not make such a distinction. A creditor would be justified in looking to both the business assets and the private estate of the owner for satisfaction of his claim. One reason for this distinction is to make it possible for the owners to have an account of the performance from those who manage the enterprise. The managers are entrusted with funds supplied by owners, banks, and others; they are responsible for the proper use of the funds. The financial accounting reports are designed to show how well this responsibility has been discharged.

☞ Check Your Progress 1

Apart from the reason mentioned above, can you think of any other reason for the justification of the Business Entity Concept?

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☞ Check Your Progress 2

The proprietor of a firm withdrew Rs. 50,000 for his personal use. This was shown as an expense of the firm and hence, profits were reduced thereby. Is this right from an accounting point of view?

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☞ Check Your Progress 3

The proprietor of a firm contributed Rs. 10 lakhs towards the capital of the firm. Does it means, from an accounting point of view, that the firm had a corresponding liability towards the proprietor?

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Money Measurement Concept

In accounting, only those facts which can be expressed in terms of money are recorded. As money is accepted not only as a medium of exchange but also as a measuring rod of value, it has a very important advantage since a number of widely different assets and equities can be expressed in terms of a common denominator. Without this adding heterogeneous factors like five buildings, ten machines, six trucks will not have much meaning.

While money is probably the only practical common denominator and a yardstick, we must realise that this concept imposes two sever limitations. In the first place, there are several facts which, though vital to the business, cannot be recorded in the books of account because they cannot be expressed in money terms. For example, the state of health of the Managing Director of a company, who has been the key contributor to the success of business, is not recorded in the books. Similarly, the fact that the Production Manager and the Chief Internal Auditor are not on speaking terms, or that a strike is about to begin because labour is dissatisfied with the poor working conditions in the factory, or that a competitor has recently taken over the best customer, or that it has developed a better product, and so on will not be recorded even though all these events are of great concern to the business.

From this standpoint, one could say that accounting does not give a complete account of the happenings in the business. You will appreciate that all these have a bearing on the future profitability of the company.

Second, the use of money implies that a rupee today is of equal value to a rupee ten years back or ten years later. In other words, we assume that there is a stable or constant value of the rupee. In the accounts, money is expressed in terms of its value at the time an event is recorded. Subsequent changes in the purchasing power of

money do not affect this amount. You are, perhaps, aware that most economies today are in inflationary conditions with rising prices. The value of a rupee in the 80s has depreciated to an unbelievably low level in the 90s. Most accountants know fully well that the purchasing power of a rupee does change, but very few recognise this fact in accounting books and make an allowance for changing price level. This is so, despite the fact that the accounting profession has devoted considerable attention to this problem, and numerous suggestions have been made to account for the effects of changes in the purchasing power of money. In fact, one of the major problem of accounting today is to find means of solving the measurement problem, that is, how to extend the quality and the coverage of meaningful information. It will be desirable to present, in a supplementary analysis, the effect of price level changes on the reported income of the business and the financial position.

☞ Check Your Progress 4

Suppose the Managing Director of a company is killed in a plane crash. To the extent that "an organisation is the lengthened shadow of a man", the real value of the company will change immediately, and this will be reflected in the market price of the company shares. Will this have any effect as far as the accounts of the company are concerned?

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Continuity Concept

Accounting assumes that the business (an accounting entity) will continue to operate for a long time in the future, unless there is good evidence to the contrary. The enterprise is viewed as a **going concern,** that is, as continuing in operation, at least in the foreseeable future. The owners have no intention, nor have they the necessity to wind up or liquidate its operations.

This assumption is of considerable importance, for it means that the business is viewed as a mechanism for adding value to the resources it uses. The success of the business can be measured by the difference between output values (sales or revenues) and input values (expenses). Therefore, all unused resources can be reported at cost rather than at market values as, according to the continuity concept, the future instead of selling them out rightly in the market.

The assumption that the business is not expected to be liquidated in the foreseeable future, in fact, establishes the basis for many of the valuations and allocations in accounting. For example, depreciation (or amortisation) procedures rest upon this concept. It is this assumption which underlies the decision of investors to commit capital to enterprise. The concept holds that continuity of business activity is the reasonable expectation for the business unit for which the accounting function is being performed. Only on the basis of this assumption can the accounting process remain stable and achieve the objective of correctly recording and reporting on the

capital invested, the efficiency of management, and the position of the enterprise as a going concern. Under this assumption neither higher current market values nor liquidation values are of particular importance in accounting. This assumption provides a basis for the application of **cost** in accounting for assets.

However, if the accountant has good reasons to believe that the business, or some part
of it, is going to be liquidated, or that it will cease to operate (say within a year or two), then the resources could be reported at their current values (or liquidation values).

☞ Check Your Progress 5

A company bought a building in 2004 at a cost of Rs.50 lakhs. At the end of the Accounting Year 2004-05, its market value is Rs.70 lakhs. The company revalues the building at Rs.70 lakhs for the year 2004-05. Is this practice right?

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Cost Concept

The resources (land, buildings, machinery, property rights, etc.) that a business owns are called assets. The money values assigned to assets are derived from the cost concept. This concept states that an asset is worth the price paid for, or cost incurred to acquire it. Thus, assets are recorded at their original purchase price and this cost is the basis for all subsequent accounting for the assets. The assets shown on the financial statements do not necessarily indicate their present market worth (or market values). This is contrary to what is often believed by an uninformed person reading the statement or report. The term ‘book value’ is used for the amount shown in the accounting records.

In the case of certain assets, the accounting values and market values may be similar; cash is an obvious example. In general, the longer an asset has been owned by the company the less, are the chances that the accounting value will correspond to the market value.

The cost concept does not mean that all assets remain on the accounting records at their original cost for all time to come. The cost of an asset that has a long but limited life, is systematically reduced during its life by a process called ‘depreciation’ which will be discussed at some length in a subsequent unit. Suffice it to say that depreciation is a process by which the cost of the asset is gradually reduced (or written off) by allocating a part of it to expense in each accounting period. This will have the effect of reducing the profit of each period. In charging depreciation the intention is not to change depreciation equal to the fall in the market value of the asset. As such, there is no relationship between depreciation and changes in market value of the assets. The purpose of depreciation is to allocate the cost of an asset over its useful life and not to adjust its cost so as to bring it closer to the market value.

You must be wondering why assets are shown at cost, even when there are wide differences between their costs and market values. The main argument is that the cost concept meets all the three basic criteria of **relevance**, **objectivity** and **feasibility**.

☞ Check Your Progress 6

A company buys machinery availing heavy discount at Rs. 40,000, but its actual market price is Rs. 60,000. Should the company show the value of machinery in their records at Rs. 40,000 or Rs. 60,000?

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Accrual Concept

The accrual concept makes a distinction between the receipt of cash, and the right to receive it, and the payment of cash and the legal obligation to pay it. In actual business operations, the obligation to pay and the actual movement of cash may not coincide. The accrual concept recognises this distinction. In connection with the sale of goods, revenue may be received (i)before the right to receive arises, or (ii) after the right to receive has been created. The accrual concept provides a guideline to the accountant as to how s/he should treat the cash receipt and the rights related thereto. In the former case the receipt will not be recognised as the revenue of the period for the reason that the right to receive the same has not yet arisen. In the latter case the revenue will be recognised even though the amount is received in the subsequent period.

Similar treatment would be given to expenses incurred by the firm. Cash payments for expenses may be made before or after they are due for payment. Only those sums which are due and payable would be treated as expenses. If a payment is made in advance (i.e., it does not belong to the accounting period in question) it will not be treated as an expense, and the person who received the cash will be treated as a debtor until his right to receive the cash has matured. Where an expense has been incurred during the accounting period, but no payment has been made, the expense must be recorded and the person to whom the payment should have been made is shown as a creditor.

☞ Check Your Progress 7

The accounting year of a firm closes on 31st December each year. The rent for business premises of Rs. 50,000 for the last quarter could not be paid to the owner on account of his being away in a foreign country. Should the rent payable be taken into account for computing the firm's income for the accounting year?

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☞ Check Your Progress 8

A government contractor supplies stationery to various government offices. Some bills amounting to Rs.10,000 were still pending with various offices at the close of the accounting year on 31st March. Should the businessman take the revenue of Rs.10,000 into account for computing the net profit of the period?

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The Concept of Conservatism

The concept of conservatism, also known as the concept of prudence, is often stated as "anticipate no profit, provide for all possible losses". This means an accountant should follow a cautious approach. Facing a choice, he should record the lowest possible value for assets and revenues, and the highest possible value for liabilities and expenses. According to this concept, revenues or gains should be recognised only when they are realised in the form of cash or assets (usually legally enforceable debts) the ultimate cash realisation of which can be assessed with reasonable certainty. Further, provision must be made for all known liabilities, expenses, and losses whether the amount of these is known with certainty, or is at best an estimate in the light of the information available. Probable losses in respect of all contingencies should also be provided for. A contingency is a condition, or a situation, the ultimate outcome of which–gain or loss–cannot be determined accurately at present. It will be known only after the event has occurred (or has not occurred). For example, a customer has filed a suit for damage against the company in a court of law. Whether the judgement will be favourable or unfavourable to the company cannot be determined for sure. Hence, it will be prudent to provide for likely loss in the financial statements. As a consequence of the application of this concept, net assets and incomes are more likely to be understated than overstated.

Based on this concept is the widely advocated practice of valuing inventory (stock of goods left unsold) at cost or market price, whichever is lower. You will note that this convention, in a way, modifies the earlier cost concept. It should be stated that the logic of this convention has been under stress recently; it has been challenged by many writers on the ground that it stands in the way of fair determination of profit, and the disclosure of true and fair financial position of the business enterprise. The concept is not applied as strongly today as it used to be in the past. In any case, conservatism must be applied rationally as over-conservatism may result in misrepresentation.

☞ Check Your Progress 9

A company is negotiating to get an order for Rs.5 lakhs from XYZ company. It is confident to get an order and as a result, it shows this order as a part of its sales revenue. Will you approve such an accounting treatment of probable order to be obtained in future?

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Materiality Concept

There are many events in business which are trivial or insignificant in nature. The cost of recording and reporting such events will not be justified by the usefulness of the information derived. The materiality concept holds that items of small significance need not be given strict theoretically correct treatment. For example, a paper stapler costing Rs. 30 may last for three years. However, the effort involved in allocating its cost over the three-year period is not worth the benefit than can be derived from this operation. Since the item obviously is immaterial when related to overall operations, the cost incurred on it may be treated as the expense of the period in which it is acquired. Some of the stationery purchased for office use in any accounting period may remain unused at the end of that period. In accounting, the amount spent on the entire stationery would be treated as an expense of the period in which the stationery was purchased, notwithstanding the fact that a small part of it still lies in stock. The value (or cost) of the stationery lying in stock would not be treated as an asset and carried forward as a resource to the next period. The accountant would regard the stock lying unused as immaterial. Hence, the entire amount spent on stationery would be taken as the expense of the period in which such expense was incurred.

Where to draw the line between material and immaterial events is a matter of judgement and common sense. There are no hard and fast rules in this respect. Whether a particular item or occurrence is material or not, should be determined by considering its relationship to other items and the surrounding circumstances. It is desirable to establish and follow uniform policies governing such matters.

☞ Check Your Progress 10

A firm buys an office table for Rs. 800. Though it is, theoretically speaking, an asset having a life, of more than one year, the firm shows it as an expense of the year, and reduces the profit for the year. Is this accounting practice justifiable? Give reasons.

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Consistency Concept

In practice, there are several ways to record an event or a transaction in the books of account. For example, the trade discount on raw material purchased may be deducted from the cost of goods and net amount entered in the books, or alternatively trade discount may be shown as the income with full cost of raw material purchased entered in the books. Similarly, there are several methods to charge depreciation (which is a decrease in the value of assets caused by wear and tear, and passage of time) on an asset, or of valuing inventory. The consistency concept requires that once a company has decided on one method and has used it for some time, it should continue to follow the same method or procedure for all subsequent events of the same character unless it has a sound reason to do otherwise. If for valid reasons the company makes any departure from the method it has been following so far, then the effect of the change must be clearly stated in the financial statements in the year of change.

You will appreciate that much of the utility of accounting information lies in the fact that one could draw valid conclusions from the comparison of data drawn from financial statements of one year with data from another year. Comparability is essential so that trends or differences may be identified and evaluated. Inconsistency in the application of accounting methods might significantly affect the reported profit and the financial position. Further, inconsistency also opens the door for manipulation of reported income and assets. The comparability of financial information depends largely upon the consistency with which a given class of events are handled in accounting records year after year.

☞ Check Your Progress 11

A company had been charging depreciation on a machine at Rs. 10,000 per year for the first 3 years. Then it began charging Rs. 9,000 for 4th year and Rs. 7,800 for 5th year and so on. Is this practice justified? Give reasons for your answer.

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Periodicity Concept

Although the results of the operations of a specific enterprise can be known precisely only after the business has ceased to operate, its assets have been sold off and liabilities paid off, the knowledge of the results periodically is also necessary. Those who are interested in the operating results of a business obviously cannot wait till the end. The requirements of these parties, therefore, force the accountant to report the

changes in the wealth of a firm for some time periods. These time periods in actual practice vary, though a year is the most common interval as a result of established business practice, tradition, and government requirements. Some firms adopt the calendar year, and some others the financial year of the government. But more and more firms are changing to the 'natural' business year, the end of which is marked by relatively lower or lowest volume of business activity in the twelve-month period. The custom of using twelve-month period is applied only for external reporting. The firms usually adopt a shorter span of interval, say one month or three months, for internal reporting purposes.

The allocation of long-term costs and the difficulties associated with this process directly stem from this concept. While matching the earnings and the cost of those earnings for any accounting period, all the revenues and all the costs relating to the year in question have to be taken into account irrespective of whether or not they have been received in cash, or paid in cash. Despite the difficulties that arise in allocations and adjustments, short-term reports (i.e., yearly reports) are of such importance to owners, management, creditors, and other interested parties that the accountant has no option but to resolve such difficulties. Obviously, the utility of the periodic financial statements outweighs the difficulties.

Some other concepts, e.g., the Matching concept, the Realisation concept and the Dual Aspect concept are discussed in units 4 and 5, and as such, they have not been taken up here.

While going through all these concepts, probably you may have developed a feeling that they sometimes conflict with each other. You are right. We illustrate this by considering some of these concepts in the context of valuation of business properties. Suppose a firm acquired a piece of land in 1985 for a price of Rs. 6,00,000. Factory premises were constructed in 1986, and operations commenced in 1987. The firm has been successful in achieving the desired profit for the past year. The Balance Sheet (a statement of assets and liabilities) for the year 2005 is being prepared and 'Land' is required to be valued. The estimated current market price of this land is Rs. 60,00,000.

Should you recommend that the land be valued at Rs. 60 lakhs? The answer is 'no', obviously. Land would be carried on the Balance Sheet at its original cost of Rs. 6,00,000 only. This decision is supported by several of the concepts discussed in this section. In the first place, the stability of purchasing power of money implied in the **money measurement concept** prevents us from recognising accretion in values as a result of changing price levels. Then, the **realisation concept** will not allow unrealised profits to be included as long as land is held by the company and not sold away. You may note that the **continuity**, or **going concern concept**, makes any possible market value of land irrelevant for the balance sheet because the firm has to continue in business, and land will be needed by it for its own use. In this connection, it could be argued that if land were shown on the balance sheet at its estimated current market value, the owner might decide to discontinue the business, sell the land and retire. The principle of **objectivity** is now introduced into the argument. It can be easily seen that in a situation like this the cost of acquisition of land at Rs. 6,00,000 in 1985 is the objective fact because it is based on a transaction that actually took place and this objective evidence is capable of being verified. In contrast, the estimate of current market value figure may be suspect. It raises many questions. Do you have a market quotation for an identical plot of land? Has a similar plot of land been sold recently, and can we pick it up as verifiable evidence of the current market price? It may be said that even if market price for an identical plot of land is not available, estimates by an accredited valuer may be accepted as verifiable evidence of the market price. Further complications may be noticed if buildings and facilities have been erected on the plot of land. Is it possible to estimate the value of land without factory buildings and other facilities constructed on it? The answer is a flat 'no', and the conservatism concept will then deter you from accepting an estimate of market value since it cannot be ascertained with reasonable accuracy.

2.4 ACCOUNTING STANDARDS

The basic concepts, discussed in the foregoing paragraphs, are the core elements in the theory of accounting. These concepts (postulates or conventions), however, permit a variety of alternative practices to co-exist. As a result, the financial results of different companies cannot be compared and evaluated unless full information is available about the accounting methods which have been used. The variety of accounting practices have made it difficult to compare the financial results of different companies. Further, the alternative accounting methods have also enabled, the reporting of different results, even by the same company.

Need for Standards: The information contained in published financial statements is of particular importance to external users, such as shareholders and investors. Without such information they would not be able to take the right decisions about their investments. As in several other countries, Parliament in India specified in the Companies Act, the type and minimum level of information which companies should disclose in financial statements. It is the responsibility of the accounting profession to ensure that the required information is properly presented. It is evident that there should not be too much discretion to companies and their accountants to present financial information the way they like. In other words, the information contained in financial statements should conform to carefully considered standards. Public confidence in accounting information contained in financial statements will grow if they are satisfied as to the logic, consistency and fairness of the figures shown therein. For instance, a company could incur a loss and still pay dividends by manipulating the loss into a profit. In the long run, this course may have a disastrous effect on the company and its investors.

You would be better able to appreciate the function of accounting standards by relating them to the basic purpose of financial statements, which is the communication of information affecting the allocation of resources. Ideally, such information should make it possible for investors to evaluate the investment opportunities offered by different firms and to allocate scarce resource to the most efficient ones. In theory, this process should result in the capital distribution of resources within the economy, and should maximise the potential benefit to society.

In this context, unless there are reasonably appropriate standards, neither the purpose of the individual investor, nor that of the nation as a whole, can be served. The purpose is likely to be served if the accounting methods used by different firms for presenting information to investors allow correct comparisons to be made. For example, they should not permit a company to report profits which result simply from a change in accounting methods rather than from increase in efficiency. If companies were free to choose their accounting methods in this way, the consequences might be that deliberate distortions are introduced, leading eventually to misapplication of resources in the economy. The relatively less efficient companies will be able to report fictitious profits, and as a result scarce capital of society will be diverted away from the more efficient companies which have adopted more strict and consistent accounting methods.

2.5 THE CHANGING NATURE OF GENERALLY ACCEPTED ACCOUNTING PRINCIPLES

Generally accepted accounting principles are usually developed by professional accounting bodies like American Institute of Certified Public Accountants (AICPA) and Institute of Chartered Accountants of India (ICAI). In developing such principles, however, the accounting profession has to reflect the realities of social, economic, legal and political environment in which it operates. Besides academic research,

regulatory and tax laws of the government, e.g., Companies Act, 1956, income Tax Act, 1961, etc., in a large measure, influence the formulation of acceptable accounting principles. Stock exchanges and other regulatory agencies like the Securities and Exchange Board of India (SEBI) have laid down rules for disclosure and the extent of accounting information.

Since the environment, in which business operates, undergoes constant changes as a result of changes in economic and financial policies of the Government and changes in the structure of business, continued evaluation of the relevance of generally accepted accounting principles is required. In this sense, the principles of accounting are not ever-lasting truths. You will appreciate that it is the development of relevant accounting principles in tune with the present day needs of the society that would make it possible for the business enterprises to develop financial statements which would be acceptable and of value to the end users.

Now, we give you a brief account of the development of standards in the United Kingdom, the United States of America, India, and other countries.

2.6 ATTEMPTS TOWARDS STANDARDISATION

Standardisation in UK and USA: Though the Institute of Chartered Accountants in England and Wales began making recommendations since 1942, real progress started with the establishment of the Accounting Statements Committee (ASC) by the Institute in 1969 in the wake of public criticism of financial reporting methods which permitted diverse practices. As a result of diversity in practices some big investors had suffered heavy losses on their investments in well-known companies. The main objective of the ASC has been to narrow areas of difference and in the variety in accounting practices. The procedure used for standardisation is initiated by the issue of an "Exposure Draft" on a specific topic for discussion by accountants, and the public at large. Comments made on exposure draft are taken into consideration when drawing up a formal statement of the accounting methods for dealing with that specific topic. The statement is known as a Statement of Standard Accounting Practice (SSAP). Once the statement of standard accounting practice is adopted by the accounting profession (the fact that a statement has been issued by the Institute in itself signifies the acceptance by the profession), any material departure by any company from the standard practice in presenting its financial reports is to be disclosed in that report. So far, nineteen statements of standard accounting practice, in addition to some exposure drafts under consideration, have been issued by the ASC.

The need for evolving standards in the USA was felt with the establishment of Securities Exchange Commission (SEC) in 1933. The SEC is the Government agency that regulates and controls the issuance of, and dealings in, securities of the companies. A research-oriented organisation called the Accounting Principles Boards (APB) was formed in 1957 to spell out the fundamental accounting postulates. The Financial Accounting Standards Board (FASB) was formed in 1973. The FASB issues statements from time to time, articulating the generally accepted accounting principles. The constant support given by SEC to FASB pronouncements has given considerable credibility to its accounting policy statement. The FASB, till 1985, has issued five statements of concepts and eighty-eight statements of financial accounting standards.

Standards at International Level: In view of the growth of international trade and multinational enterprises, the need for standardisation at the international level was felt. An International Congress of Accountants was organised in Sydney. Australia in 1972 to ensure the desired level of uniformity in accounting practices. Keeping this in view, the International Accounting Standards Committee (IASC) was formed and was entrusted with the responsibility of formulating international standards. All the member countries of IASC resolved to conform to the standards developed by IASC,

or at least to disclose variations from recommended standards. After its formation in 1973, the IASC has issued 40 international accounting statement to date. Another professional body, the International Federation of Accountants (IFAC) was established in 1978.

Attempts have also been made in countries in the European Economic Community (EEC), and in Canada for standardisation of accounting practices regarding disclosure and consistency of procedures.

2.7 ACCOUNTING STANDARDS IN INDIA

With a view to harmonise varying accounting policies and practices currently in use in India, the Institute of Chartered Accountants of India (ICAI) formed the Accounting Standards Board (ASB) in April 1977 which includes representatives from industry and government. In line with the procedure followed in other countries, the preliminary drafts prepared by the study groups and approved by ASB are circulated amongst various external agencies, including the representative bodies of trade, commerce, and industry. So far, twenty eight standards have been issued by ASB, a brief description of which is provided in Appendix I to this unit.

The standards are recommendatory in nature in the initial years. They are recommended for use by companies listed on a recognised stock exchange and other large commercial, industrial, and business enterprises in the public and private sectors.
We advise that you read all or at least some of these standards in order to get a feel of what these standards are all about. What are the policies and procedures of accounting that these standards aim to standardise and why? Do not worry if you are unable to understand some of the ideas or expressions contained in the standards. You may like to come back to these standards after you have been through all the blocks of this course, in order to have a better grasp of them.

Regarding the position in India, it has been stated that the standards have been developed without first establishing the essential theoretical framework. Without such a framework, it has been contended, any accounting standards and principles developed are likely to lack direction and coherence. This type of shortcoming also existed in the UK and USA, but then it was recognised and remedied a long time ago. In the United States, the first task which the FASB undertook was to develop a conceptual framework project which aimed at defining the objectives of financial reporting (a sample of which is presented in Appendix II). This was to be followed by the spelling out of concepts and standards establishing what have been frequently referred to as generally accepted accounting principles (GAAP). Any attempt to develop a conceptual framework regarding the objectives of reporting will have to take into consideration the answers to the following questions:

i) Who are the users of financial reports?
ii) What decisions do these user groups have to take?
iii) What information can be provided that would assist them to take such decisions?

The objectives, as you have already noted, depend upon the economic, social, legal and political environment of the country.

At this point it will be useful for you to watch the video programme: **Understanding Financial Statement-Part I.**

2.8 SUMMARY

Accounting as a field of study in its developmental process has evolved a theoretical framework consisting of principles or concepts over period of time. These concepts enjoy a wide measure of support from the accounting profession. That is why they are known as Generally Accepted Accounting Principles (GAAP) . Several concepts, and their implications for business and information users, were discussed in this unit.

Since the accounting principles are broad guidelines for general application, they permit a wide variety of methods and practices. The lack of uniformity in accounting practice makes it difficult to compare the financial reports of different companies. Moreover, the multiplicity of accounting practices makes it possible for management to conceal economic realities by selecting those alternative presentations of financial result which allow earnings to be manipulated. The financial statements prepared under such conditions, therefore, may have limited usefulness for several users of information. This problem has been recognised all over the world and various professional bodies are engaged in the task of standardising accounting practices. There is a movement towards consensus building even at the international level. Such professional bodies, in fact, first look at the practices used by practising accountants They then try to obtain a refinement of those practices by a process of consensus. It is in this manner that the theory of accounting is built. In India also, some headway has been made by establishing twenty eight standards for accounting practice.

2.9 KEY WORDS

Accounting framework includes generally accepted accounting principles (GAAP) on the basis of which accounting data is processed, analysed, and reported.

Accounting theory is a set of inter-related principles and propositions, which provide a general framework for accounting practice, and deal with new developments in the area.

Accrual concept says that an accountant should recognise incomes and expenses when they have actually accrued, irrespective of whether cash is received or paid.
Consistency concept envisages that accounting information should be prepared on a consistent basis from period to period, and within periods there should be consistent treatment of similar items.

Conservatism concept forbids the inclusion of unrealised gains but advocates provision for possible losses.

Cost Concept states that an asset is to be recorded in books of accounts at a price for, or at a cost incurred to acquire it.

Entity concept separates the business from owner(s), from the standpoint of accounting.

Going concern concept refers to the expectation that the organisation will have an indefinite life. This assumption has an important bearing on how the assets are to be valued.
Materiality concept admonishes that events of relatively small importance need not be given a detailed or theoretically correct treatment. They may be ignored for recording purpose.

Money measurement concept states that all transactions are to be recorded only in monetary terms and record only those transactions, which can be measured in money terms. It ignores intangibles like employee loyalty and customer satisfaction, as they cannot be expressed in money terms. It also assumes records on the basis of a stable monetary unit.

Objectivity principle requires that only the information based on definite and verifiable facts are to be recorded.

Periodicity concept divides the life of a business into smaller time periods which are generally one year, and the accountant is supposed to prepare necessary financial statements for each time period.

2.10 SELF ASSESSMENT QUESTIONS/EXERCISES

1. Examine the role of the Entity accounting concepts in the preparation of financial statements.

2. Is it possible to give a true or a fair view of a company's position using accounting information?

3. Do you find any of the accounting concepts conflicting with each other? Give examples.

4. In what way can accounting information help in the proper allocation of resources?

5. Why should accounting practices be standardised? Explain.

6. What progress has been made in India regarding the standardisation of accounting practices?

7. Answer whether the following statement are True or False:

   a) The materiality concept refers to the state of ignoring small items from and values accounts. ☐
   b) The generally accepted accounting principles ensure a uniform accounting practice. ☐
   c) The conservatism concept leads to the exclusion of all unrealised profits. ☐
   d) Statements of Standard Accounting Practice were formulated by the Financial Accounting standards Board of USA. ☐
   e) The Securities Exchange Commission of USA has played an important role in evolving the conceptual framework for accounting ☐

8. Conceptual framework of accounting implies:

   i) Making entries in the books of accounts
   ii) A code of conduct for the accounting profession
   iii) General principles for the preparation of accounting information
   iv) Planning and control of enterprise operations
   v) None of the above.

9. Accounting Standards are statements prescribed by:

   i) Law
   ii) Government regulatory bodies
   iii) Bodies of shareholders
   iv) Professional accounting bodies
   v) None of the above.

10. Accounting concepts are:

    i) Broad assumptions
    ii) Methods of presenting financial accounts

iii) Bases selected to prepare a specific set of accounts
iv) None of the above.

11. Name the accounting concept violated, in any of the following situations:

    a) The Rs, 1,00,000 figure for inventory on a Balance Sheet is the amount for which it could be sold on the balance sheet date.
    b) The Balance Sheet of a retail store which has experienced a gross profit of 40% on sales contains an item of merchandise inventory of Rs. 1,15,00,000: Merchandise inventory (at cost) Rs. 69,00,000.
    c) Company M does not charge annual depreciation, preferring instead to show the entire difference between original cost and proceeds of sale as a gain or loss in the period when the asset is sold. It has followed this practice for many years.

Answers to Activities

1. If the 'separate entity concept' is not observed, it becomes difficult to calculate the profitability of business and ascertain its financial position. It would be particularly difficult if the owner has several distinct businesses.

2. Proprietary withdrawals reduce the capital of the enterprise unless they are in lieu of anticipated profits. It is not proper to show them as operating expense. They are also not admissible as deductions from profits for tax purposes.

3. Yes, because as per the entity concept the business and the proprietor are two separate entities. If the proprietor contributes some amount towards capital, it means that the business has a liability to return it to the proprietor.

4. No, the money measurement concept does not permit the recording of such events. What effect this event will have on the business cannot be objectively determined.

5. Revaluation violates several concepts like, cost concept, conservatism concept, and continuity concept. To take credit for an extraordinary gain like this is normally not considered justified. However, were a substantial gap exists between the historical cost of a fixed asset and its market value, it has been observed that the accounting profession has been supporting such revaluations so that the balance sheet could show a realistic position of the enterprise.

6. As per the cost concept, the company should show the value of machinery in books of accounts at Rs. 40,000 the price, which is being actually paid.

7. It should be taken into account, otherwise profit will be overstated.

8. It should be taken into account, otherwise profit will be understated.

9. No. Since the order is not actually obtained, the probable sales revenue could not be recognised as per the conservatism concept.

10. Though the table has a long-term life and as such can be shown as an asset, yet the materiality concept requires it to be treated as an expense.

11. It violates the consistency concept, unless there is a solid reason for departing from the earlier practice.

Answer to Self-assessment Questions Exercises

7. a) True b) True c) True d) False e) True.

8. (iii)

9. (iv)

10. (i)

11. (a) Conservatism concept, (b) Cost concept, (c) Periodicity concept.

2.11 FURTHER READINGS

Financial Accounting, Maheshwari, S.N. and S.K. Maheshwari, 2000, Vikas Publishing House: New Delhi (Chapter 2).

Accounting Principles, Anthony, Robert, N. and James Reece, 1987*,* All India Traveller Book Seller: New Delhi (Chapters 1-3).

Accounting, The Basis for Business Decisions, Meigs, Walter, B.and Robert F. Meigs, 1987, McGraw Hill: New York (Chapter 1).

Accounting Theory, Hendriksen, E. S., 1984, Khosla Publishing House, Delhi (Chapters 2,3 and 6).

Appendix I

Accounting Standards Board

The Institute of Chartered Accountants of India (ICAI) has, so far, issued twenty eight standards:

Framework for the Preparation and Presentation of Financial Statements

(AS 1) Disclosure of Accounting Policies

(AS 2) Valuation of Inventories

(AS 3) Cash Flow Statements

(AS 4) Contingencies and Events Occurring after the Balance Sheet Date

(AS 5) Net Profit or Loss for the period, Prior Period, and Extraordinary Items and Changes in Accounting Policies

Announcement — Limited Revision to Accounting Standards (AS) 5

(AS 6) Depreciation Accounting

(AS 7) Accounting for Construction Contracts
Revised Accounting Standard (AS) 7, Construction Contracts, 28-05-2002

(AS 8) Accounting for Research and Development

(AS 9) Revenue Recognition

(AS 10) Accounting for Fixed Assets

Announcement — Status of certain provisions of AS 10, Accounting for Fixed Assets, pursuant to the issuance of AS 19, Leases and As 16, Borrowing Costs

(AS 11) Accounting for the Effects and Changes in Foreign Exchange Rates

(AS 11) (Revised 2003). The Effects of Changes in Foreign Exchange Rate 21-02-2003

(AS 12) Accounting for Government Grants

(AS 13) Accounting for Investments

(AS 14) Accounting for Amalgamations

(AS 15) Accounting for Retirement Benefits in the Financial Statement of Employers

(AS 16) On Borrowing Costs

(AS 17) Segment Reporting

Disclosure of corresponding previous year figures in the first year of application of

Accounting Standards (AS) 17, Segment Reporting

Accounting Standard 18, Related Party Disclosures
Applicability of Accounting Standards (AS) 18, Related Party Disclosures
(AS 19) Leases

(AS 20) Earnings Per Share

(AS 21) Consolidated Financial Statements

(AS 22) Accounting for Taxes on Income
Clarification on Accounting Standards (AS) 22, Accounting for Taxes on Income

(AS 23) Accounting for Investments in Associates in Consolidated Financial Statements

(AS 24) Discontinuing Operations
Announcement — Accounting Standards (AS) 24, Discontinuing Operations

(AS 25) Interim Financial Reporting

(AS 26) Intangible Assets

(AS 27) Financial Reporting of Interests in Joint Ventures

(AS 28) Impairment of Assets 30-05-2002

For further details, please visit: http://www.icai.org/resource/o_ac_standard.html

Appendix II

Financial Accounting Standards Board (FASB)

Concepts No. 1: ‘ Objectives of financial reporting by business enterprises’.

The three objectives which are included in concept No. 1 are reproduced below:

1) Financial reporting should provide information that is useful to the present and potential investors and creditors and other users in making rational investment, credit and similar decisions. The information should be comprehensible to those who have a reasonable understanding of business and economic activities and are willing to study the information with reasonable diligence.

2) Financial reporting should provide information to help present and potential investors and creditors and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from the sale, redemption, or maturity of securities or loans. Since investors’ and creditors’ cash flows are related to enterprise cash flows, financial reporting should provide information to help investors, creditors and others, assess the amounts, timing, and uncertainty of prospective net cash inflows to the related enterprise.

3) Financial reporting should provide information about the economic resources of an enterprise, the claim to those resources (obligations of the enterprise to transfer resources to other entities and owners’ equity), and the effects of transaction, events, and circumstances that change its resources and claims to those resources.

UNIT 1 PREPARATION AND ANALYSIS OF FINAL ACCOUNTS

Structure **Page Nos.**

1.0 INTRODUCTION

The primary function of accounting is to accumulate accounting data in order to calculate the profit and loss made by the business firm during and also to understand the financial position of the business on a given date. A business can ascertain this by preparing the Final Accounts. Preparation of final accounts from a trial balance is the final phase of the accounting process. Final accounts include the preparation of Trading and Profit and Loss Account and the Balance Sheet, although the Balance Sheet is not an account but only a statement. Trading and Profit and Loss Account is simply one account which is usually divided into two sections. The first section is called the Trading Account and the second section the Profit and Loss Account. In case of manufacturing concerns, Final Accounts also include the Manufacturing Account.

1.1 OBJECTIVES

After going through this unit, you should be able to:

- define Final Account;
- understand their objectives and preparation of Trading and Profit and Loss Account;
- conclude the difference between Trading Account and Profit and Loss Account, Gross Profit and Net Profit;
- understand and explain the terms used in a balance sheet;

- apply simple principles of valuation of assets;
- role of depreciation in valuation and determining the proper profit of a firm;
- understand Adjustment entries; and
- the importance of adjustment entries to ascertain the financial position of a business firm.

1.2 TRADING ACCOUNT

Trading account is prepared to ascertain the Gross Profit and Loss of a firm, where Gross Profit is the excess of net revenue over cost of goods sold (the credit side of the trading account exceeds the debit side). Similarly, Gross Loss is the excess of cost of goods sold over net revenue (the debit side of the trading account exceeds the credit side).

Gross Profit = Net Sales Revenue – Cost of Goods Sold
Gross Loss = - (Net Sales Revenue – Cost of Goods Sold)

Where:

Net Sales Revenue = Cash Sales + Credit Sales – Sales Returns

Cost of Goods Sold = Opening Stock + Net Purchases + Direct Expenses – Closing Stock

Net Purchase = Cash Purchases + Credit Purchases – Purchases Returns.

Trading Account is generally prepared in 'T' form. In this case, opening stock, purchases and direct expenses are shown on the debit side and sales and closing stock on the credit side of the trading account. The format of the Trading Account is explained along with the format of Profit and Loss Account.

1.2.1 Opening/Closing Stock

The Opening Stock of goods is the stock of goods in hand at the beginning of an accounting year. This may include stock of raw material, work-in-progress and fininshed goods. This appears in the debit column of the trial balance. In the Trading Account this is the first entry on the debit side. The valuation is usually done at cost or market price which ever is lower. The Stock of goods in hand at the end of accounting year is called Closing Stock. Similarly, closing stock may include stock of raw material, work-in-progress and finished goods. The closing stock is shown on the credit side of the Trading Account. Closing stock is usually not given in the trial balance but is given by way of additional information.

1.2.2 Net Purchases

These include goods purchased only for production and selling purposes. Goods used as assets and not- for- sale are not included in this head. Net purchase is the difference between purchases and the purchase return, where purchase is the sum of cash and credit purchase. Note that sometimes, purchased return is known as Return Outward.

1.2.3 Direct Expenses

Direct expenses include all those expenses incurred in bringing the goods to the place of business or trade or in-production process until the goods are placed in a saleable position. The following expenses may be considered as direct expenses:

1. **Wages paid** to workers engaged in production are debited to the trading account provided the manufacturing account is not prepared separately.

2. **Carriage/freight inwards** are transportation expenses incurred to bring the goods or raw material to the place of the business or to the firm's godown/factory. Such expenses, whether paid or outstanding, are debited to trading account.

3. **Octroi** is paid when goods enter municipal limits. Octroi paid on goods purchased is a direct expense and is debited to trading account.

4. **Custom duty** paid on importing goods for selling purposes is debited to trading account. If the duty is paid on sales export, it amounts to selling expenses and is shown in the profit and loss account.

5. **Factory rent, insurance, lighting & power and heating** are the expenses incurred to convert raw material into finished goods. Such expenses are debited to trading account.

1.2.4 Net Sales

It includes both cash and credit sales of goods. From this figure of total sales, sales return (also called Returns Inward), if any, is deducted in the inner column and the net sales amount is shown in the outer column on the credit side of the Trading Account. Sales of assets are not credited to the Trading Account. It should be noted, if goods have been sold but not yet dispatched, these should not be shown under sales but are included in closing stock if the property/ownership in the goods has not passed to the customer. But if the property/ownership in the goods has passed to the customer goods sold but not yet dispatched it will not be included in closing stock but will be treated as sales.

Following is the proforma of the Trading Account:

Trading Account
For the Year Ended

Debit **Credit**

Particular	**Rs.**	**Particulars**	**Rs.**
Opening Stock:		**Net sales**:	
Raw Material		Sales	
Work-in-Progress		Less: Sales Return	
Finished Goods			
		Closing Stock:	
Net Purchase:		Raw Material	
Purchase		Work-in-Progress	
Less: Purchase Returns		Finished Goods	
Direct Expenses			
Direct Material		**Transfer to Profit & Loss**	
Direct Labour		**Account**	
Profit & Loss Account		(If Gross Loss)	
(If Gross Profit)			

Illustration 1

Prepare the Trading Account from the following details:

Opening stock Rs.25,000; Purchases Rs. 80,100; Carriage Inward Rs. 12,000; Stock at the end Rs. 15,000; Carriage Outward Rs. 2,000; Office Rent Rs. 5,000;
Sales Rs. 1,40,000; Sales Return Rs. 2,000; Purchases Return Rs. 100.

Solution

Trading Account
For the year ending

Particulars		Rs.	Particulars		Rs.
Opening Stock:		25,000	**Net sales**:		
Raw Material			Sales	1,40,000	
Work-in-Progress			Less: Sales Return	2,000	1,38,000
Finished Goods					
			Closing Stock:		15,000
Net Purchase:			Raw Material		
Purchase	80,100	80,000	Work-in-Progress		
Less: Purchase Returns	100		Finished Goods		
		48,000			
Profit & loss Account					
(Transferred to)		1,53,000			1,53,000

☞ Check Your Progress 1

1) Prepare the Trading Account from the following figures:

Opening Stock	40,000	Power	6,000
Purchases	1,80,000	Octroi	11,000
Carriage Inward	4,000	Freight	8,000
Wages	42,000	Sales	3,20,000
Return Outwards	7,000	Sales Return	10,000

Closing Stock Rs. 60,000.

2) How is Purchases different from Net Purchases?

3) How are Net Sales different from Sales?

1.3 PROFIT AND LOSS ACCOUNT

Profit and Loss Account is prepared in order to discern whether the firm has made net profit or suffered net loss for a given accounting period. This account deals with indirect expenses such as administrative, selling and distribution expenses and the like. Profit and Loss Account starts where trading account ends; in other words it starts with gross profit on the credit side brought forward from the trading account. In case of gross loss brought forward from the trading account, profit and loss account begins with gross loss as the first item on the debit side.

All the indirect/running expenses, incurred on selling and distribution of the goods and the general administration of the business, are listed on the debit side while all the items of income and gain are listed on the credit side. When the credit side (revenue) exceeds the debit (expenses) side, the difference is net profit. But, if the debit side exceeds the credit side, the difference is net loss. Profit and loss account is balanced by transferring net profit to the capital account(s) in the balance sheet and net profit thus increases the capital; the net loss is deducted from the capital account(s) in the balance sheet and thus decreases the capital.

The following items are debited in the profit and loss account:

1. Administrative Expenses including Office Salaries, Office Rent, Office Lighting, Printing, Director's Fees, Telephone Rent, Postage, Insurance, etc.

2. Sales and Distribution Expenses including Salesmens salary, Commission, Travelling expenses, Advertising, Packing expenses, Royalty, etc.
3. Financial Expenses including Interest on loan/Capital, Cash Discount Allowed, Bad Debts, Bank Charges, etc.
4. Depreciation of Assets and various provisions.
5. Other Expenses and Losses including Loss on Sales of Fixed Assets, Loss by Fire, by Theft, by Accident, etc.
6. Taxes including Sales Taxes, Income Taxes etc.

The following items are credited in the Profit and Loss Account:

1. Cash Discount Received
2. Interest Received
3. Rent Received
4. Gain on Sale of Fixed Assets
5. Apprentice Premium
6. Dividend Received.

Note: The household and personal expenses of the proprietor paid by the firm do not appear in the profit and loss account. Rather these are treated as personal drawings of the proprietor and are deducted from the capital in the balance sheet.

The Following is the proforma of Trading and Profit & Loss Account:

PROFIT AND LOSS ACCOUNT
For the year ended…

Debit **Credit**

Particulars	**Rs.**	**Particulars**	**Rs.**
Trading Account (For Gross Loss)		**Trading Account** (For Gross Profit)	
Indirect / office Running Expenses		**Income and Gain**	
Rent		Cash Discount Received	
Lighting		Interest Received	
Salaries		Rent Received	
Insurance		Gain on Sale	
Sundry /General Expenses		Bonus Received	
Printing and Stationery		Income on Investment etc.	
Repair		**Capital Account** (Transfer of Net Loss)	
Advertising			
Commission Paid			
Cash Discount Allowed			
Motor Expenses			
Warehouse Rent/ Insurance			
Packing Expenses			
Depreciation			
Provision for Doubtful Debts			
Interest on Loan			
Loss on Sale etc.			
Capital Account (Transfer of Net Profit)			
Total		**Total**	

Note: 1. Either gross profit or gross loss as opening balance will be reflected.
2. Similarly, the ending balance will also reflect either net profit or net loss.

Illustration 2:

The Following figures from trial balance has been extracted from the books of M/s. Naina Prepare the Trading and Profit & Loss Account for the year ended 31 March 2004.

	Debit (Rs.)	Credit (Rs.)
Drawings	35,000	
Building	60,000	
Debtors and Creditors	50,000	80,000
Returns	3,500	2,900
Purchases and Sales	3,00,000	4,65,000
Discount	7,100	5,100
Life Insurance	3,000	
Cash	30,000	
Stock (Opening)	12,000	
Bad Debts	5,000	
Reserves for Bad Debts	-	17,000
Carriage Inwards	6,200	
Wages	27,700	
Machinery	8,00,000	
Furniture	60,000	
Salaries	35,000	
Bank Commission	2,000	
Bills Receivable/Payable	60,000	40,000
Trade Expenses/Capital	13,500	9,00,000

Adjustment: Stock on 31st March 2004 was valued at Rs. 50,000**.**

Solution

M/s. Naina
Trading and Profit & Loss Account
For the Year Ending on 31st March, 2004

Debit **Credit**

Particulars		**Rs.**	**Particulars**		**Rs.**
To Opening Stock		12,000	By Sales	4,65,000	
To Purchases	3,00,000		Less: Return	3,500	
Less: Return	2,900				4,61,500
		2,97,100			
To Wages		27,700			
To Carriage Inward		6,200	By Closing Stock		50,000
To Gross Profit		1,68,500			
		5,11,500			5,11,500
		7,100			
To Discount Paid		3,000			
To Life Insurance		35,000	By Gross Profit		1,68,500
To Salaries		2,000	By Discount Received		5,100
To Bank Commission		13,500	By Reserve for Bad Debts		17,000
To Trade Expenses		5,000			
To Bad Debts		1,25,000			
To Net Profit		1,90,600			1,90,600

Note: Balance Sheet of this Illustration is given on under topic *"Balance Sheet"*

1.4 DIFFERENCE BETWEEN TRADING AND PROFIT AND LOSS ACCOUNT

1. Trading account is prepared in order to calculate gross profit/loss, while the function of the profit and loss account is to disclose net profit/loss.

2. Trading account deals with the sales and cost of goods sold which includes direct expenses. But the profit and loss account deals with indirect expenses such as administrative and financial expenses and the same is charged against gross profit and other revenues.

3. The result of the trading account in the form of gross profit/loss is transferred to profit and loss account while the result of profit and loss account in the net profit/loss is transferred to capital account**.**

☞ Check Your Progress 2

1) List all the items debited or credited in the Profit and Loss account.

2) Explain the difference between Trading Account and Profit & Loss Account.

3) Explain the difference between Gross Profit and Net Profit.

4) Prepare Trading and Profit and Loss Account for the year ended 2005.

Particulars	**Dr. (Rs.)**	**Cr. (Rs.)**
Capital		1,00,000
Building	15,000	
Drawing	18,000	
Furniture	7,500	
Motor Car	25,000	
Interest Paid for Loan	900	
Loan from Ashok @ 12%		15,000
Purchases and Sales	75,000	1,00,000
Opening Stock	25,000	
Establishment Ex.	15,000	
Wages	2,000	
Insurance	1,000	
Commission		7,500
Debtors and Creditors	28,100	10,000
Bank Balance	20,000	

Closing Stock Rs. 32,000.

1.5 BALANCE SHEET

Balance sheet is concerned with reporting the financial position of an entity at a particular point in time. This position is conveyed in terms of listing all the things of value owned by the entity as also the claims against these things of value i.e. Liabilities. The position as represented by i.e., Assets. The balance sheet is valid only until another transaction is carried out by the entity.

The above statement can be elaborated by an example:

I want to purchase a car costing Rs. 8,00,000. To do so, I have to borrow capital/money. A bank agrees to finance me if I can invests. 3,00,000 on my own.

Now let us follow the sequence of events when I approach the bank with the proposal. Granting my ability to repay the loan, the banker will ask two specific questions:

1. What are the things of value you own?
2. How much do you owe, and to whom?

In other words, the banker would like to know what I am worth in material terms. My replies to the questions could be tabulated as follows:

Claims against things of value		Things of value owned by me	
	Rs.		Rs.
Personal loan from friend	1,00,000	Balance with bank	3,50,000
		Fixed deposits	1,50,000
		Other personal belongings	5,00,000
	1,00,000		10,00,000

This implies I own Rs. 10,00,000 worth things of value, Rs. 3,50,000 of this could be withdrawn at any time in cash. We say I have Rs. 3,50,000 in liquid form. Another Rs. 1,50,000 is in monetary investment and the remaining Rs. 5,00,000 is in non-monetary property. Further, I owe Rs. 1,00,000 to friend of mine. In other words, he has got a claim against the things of value owned by me to the extent of Rs. 1,00,000. In brief, we can say I am worth Rs. 10,00,000, claim against my worth is Rs. 1,00,000 and hence my **net worth** is Rs. 9,00,000. This implies Rs. 9,00,000 is my own claims against the things of value owned by me or my net worth.

Now I can present my financial position in the following form:

Financial Position Statement 1

Amount owned by me		Things of value owned by me	
	Rs.		Rs.
Personal loan from friend	1,00,000	Balance with bank	3,50,000
Own claim or net worth	9,00,000	Fixed deposits	1,50,000
		Other personal belongings	5,00,000
	10,00,000		10,00,000

Now that the bank grants me the loan of Rs. 5,00,000 and I buy the car for Rs.8,00,000. After purchase of the car my financial position statement will change as follows:

Financial Position Statement 2

Claims against things of value		Things of value owned	
	Rs.		Rs.
Personal loan from friend	1,00,000	Balance with bank	50,000
Mortgage loan from bank	5,00,000	Fixed deposit	1,50,000
Own claim or net worth	9,00,000	Car	8,00,000
		Other personal belongings	5,00,000
	15,00,000		15,00,000

Now, as a result of this transaction my worth has increased from Rs. 10,00,000 to Rs.15,00,000. However, since there is also an equal increase in claims against my worth in the form of mortgage loan from the bank, my net worth remains the same.

Things of monetary value possessed by an entity are referred to as assets. Accountants use the term assets to describe things of value measurable in monetary terms.

The amount owed by an entity or individual which represent claims against it or his assets by outsiders are liabilities. It is the claims of outsiders which are legally enforceable claims against an individual or entity that are referred to as liabilities.

The assets owned by the entity, less liabilities or outsider's claims, is the net worth. Since the net worth represents the claims of owner(s) in case of an **entity**, it is referred to as owner's equity.

Now we can understand that the financial position statement is a summary of the assets, liabilities and net worth of a firm at a specific point in time.

1.6 CONSTRUCTING A BALANCE SHEET

Having examined the conceptual basis of the balance sheet we will now try to study the balance sheet itself. We have seen that every transaction affects the financial position. Since it is not feasible to draw up a balance sheet after every transaction, it is prepared at the end of a specified period, usually, a year. This period is referred to as **accounting period** or **fiscal year** or **financial year**. This period as a convention has become one calendar year, though, there is no accounting justification for it.

Balance sheet preparation is the arrangement of the assets and liabilities of a firm in a proper or in a systematic way. The balance sheet as prepared at the end of the accounting period shows the year-end status of each of the assets of the firm and the various claims on these assets. We could also say that the balance sheet shows the **year-end balance** in the asset, liability and capital accounts. It may be clarified that there are two conventions of preparing the Balance sheet. The American and the English. According to the American convention, assets are shown on the left hand side and the liabilities and the owner's equity on the right hand side. The **English convention** is just the opposite. i.e., assets are shown on the right hand side of the Balance Sheet and the liabilities and the owner's equity on the left hand side. In India, generally the English conventions are followed. The format given below is the format of the balance sheet in the order of **liquidity**, i.e., ease of conversion of the assets into cash. The more liquid assets is shown first and then the less liquid one appear on the pro-forma. Similarly, on the liabilities side, current liabilities in order of payment are shown first, then fixed or long-term and lastly, the capital of the proprietor.

Balance Sheet as on _____

Liabilities	Rs.	Assets	Rs.
Current Liabilities		**Current Assets**	
Creditors		Cash in Hand	
Bills Payable		Cash at Bank	
Bank Overdraft		Stock-in-Trade	
Outstanding Expenses		Debtors	
Income Received in Advance		Bills Receivable	
		Prepaid Expenses	
Fixed Liabilities		**Fixed Assets**	
Loan		Furniture and Fixtures	
Mortgage		Plant Machinery	
Capital		Land	
		Goodwill	

The assets of a business can also be shown in the balance sheet in order of **permanence**, i.e., in order of the desire to keep them in use.

Balance Sheet as on _____

Liabilities	Rs.	Assets	Rs.
Capital		Goodwill	
Mortgage		Patents and Trade Marks	
Bank Overdraft		Furniture and Fittings	
Outstanding Expenses		Plant and Machinery	
Income Received in Advance		Unexpired Expenses	
Creditors		Stock-in-Trade	
Bills Payable		Sundry Debtors	
Loan		Investments	
		Bills Receivable	
		Cash in Bank	
		Cash in Hand	

Now, let us examine how the ideas what we have learnt so far could be used in a business situation. Please recall that based on the entity principle we shall be dealing with the 'business' as distinct and separate from the owners. We shall demonstrate this by means of an illustration. Following is the Balance sheet of the above mentioned profit and loss account:

M/s. Naina
Balance Sheet as on 31st March, 2004

Liabilities		Rs.	Assets	Rs.
Capital	9,00,000		Building	60,000
+ Net profit	1,25,000		Machinery	8,00,000
- Drawings	35,000	9,90,000	Furniture	60,000
Bills Payable		40,000	Debtors	50,000
Creditors		80,000	Stock	50,000
			Cash	30,000
			Bills Receivable	60,000
		11,10,000		11,10,000

The following Accounting Concepts would enable us to evaluate the balance sheet:

- The **dual aspect principle** has particular relevance to balance sheet. As per this principal, every transaction is related as one which has dual effects and hence, it is recorded on debit side as well as credit side. Due to this, we ensure the **equality of assets to liabilities and owner's equity**.
- All the figures are expressed in **monetary units** irrespective of its nature. In our example we had cash, merchandise inventory and shop premises all expressed in **monetary quantities**.
- All the transactions we reflected were in respect of only the **business entity**, and as such, the balance sheet represents the financial position of the business entity and not that of the owners.
- All the valuations were based on the assumption of a **going concern**, and not based on liquidated value. As a consequence, the total value of the assets is written off over a period through a mechanism known as depreciation.
- All the assets were based on **historical cost** as the basis of valuation.

☞ **Check Your Progress 3**

Complete the following blanks:

1) Balance sheet is prepared at the end of a specified period. This period in accounting is variously referred to as:
   a) _____ _____
   b) _____ _____
   c) _____ _____

2) Balance sheet prepared at the end of an year summarises the balances in:
   a) _____ Accounts b) _____ Accounts
   c) _____ Accounts.

3) Assets on a balance sheet are usually grouped together as:
   a) _____assets b) _____ equipment
   c) _____assets.

4) Claims against the assets on the balance sheet are summarised as:
   a) _____ liabilities b) _____ liabilities
   c) _____equity.

1.7 CLASSIFICATION OF BALANCE SHEET'S ITEMS

The balance sheet lists assets, liabilities and capital separately. It is an accepted convention that the assets and liabilities are shown into sub-groups and listed in the order of their **liquidity/Permanence**.

The balance sheet in our example/format is presented in the T account form. That is the assets are listed on one side and liabilities and owners' equity on the other.

Another commonly used way of presentation is the **report form** where liabilities and capital are listed above the assets. However, the presentation matters very little since the balance sheet represents the equality between assets, liabilities and capital.

Current Assets

Current assets are assets, which will normally be converted into cash within a year or within the **operating cycle**. The operating cycle is the duration in time taken by a unit to convert raw material into finished goods, plus time to sell it and finally, plus time to get cash from debtors to whom goods are sold. For example, in a simple trading operation, we use cash to buy merchandise and sell it to recover cash. The operating cycle in such a situation will consist of the period for which, merchandise inventory, and receivables are held. The cycle starts with cash and ends with the collection of cash. Current Assets are liquid and current liabilities can be met from the realisation of them.

Cash

Cash is usually taken to include currency (legal tender), cheques or any other document that circulates as cash. Cash is usually classified as a current asset when it is available for a firm's day-to-day operations . It includes cash kept in the cash chest as also deposits on call on current accounts with banks. If cash is specifically earmarked for any purpose and not available for transactions it is better classified as **other assets.**

Accounts Receivable

Accounts receivable are amounts owed to the company by **debtors**. This is the reason why we also use the term **sundry debtors** to denote the amounts owed to the firm. This represents amounts usually arising out of normal commercial transactions. In other words, 'accounts receivable' or sundry debtors represent unpaid customer accounts. In the balance sheet illustration these represent amounts owed to the firm by customers on the balance sheet date. These are also known as trade receivables, since they arise out of normal trading transactions. Trade receivables arise directly from credit sales and as such provide important information for management and outsiders. In most situations these accounts are unsecured and have only the personal security of the customer.

It is normal that some of these accounts default and become uncollectable. These collection losses are called **bad debts**. It is not possible for the management to know exactly which accounts and what amount will not be collected. However, based on past experience, it is possible for the management to estimate the loss on the receivable or sundry debtors as a whole. Such estimates reduce the gross value of accounts receivable to their estimated realisable value. For instance:

Accounts Receivable	7,50,000
Less: Estimated collection loss at 10%	75,000
Net realisable value of accounts receivable	6,75,000

The estimated collection loss is variously referred to as provision for doubtful debts, provision for bad debts or provision for collection losses.

It is a usual practice for debts to be evidenced by formal written promises to pay or acceptance of an order to pay. These formal documentary debts represent **Promissory Notes, Receivable** or **Bills Receivable**. These instruments used in trade are negotiable instruments and hence enable the trader to assign any of his/her receivables to another party or a bank for realising immediate liquidity.

It is also usual for accounts receivables to be pledged or assigned mostly to banks against short-term credits in the form of **cash credits** or **overdrafts.**

Inventory

In a trading firm, inventory is merchandise held for sale to customers in the ordinary course of business. In case of manufacturing firms, inventory would mainly consist of materials required to manufacture the products, namely, raw materials, materials remaining with the factory at various stages of completion i.e., work in process and goods ready for sale or finished goods. Apart from these there may be inventory of stores and supplies. Thus we have raw material inventory, work in process inventory, finished goods inventory and stores and supplies inventory.
It is common to refer to inventory as stock-in-trade and thus we could come across stock of raw materials, stock of work in process and stock of finished goods.
Inventory is usually valued on the basis of "lower of cost or market price". Market price is taken to mean the cost of replacement either by purchase or by reproduction of the material in question. As a general principle, inventory cost includes all normal costs incurred to make the goods available at the place where it can be sold or used are, treated as costs of inventory.

In trading firms, inventory costs include freight-in, transit insurance costs, import or entry levies as also the invoice cost. Warehouse costs, handling costs, insurance costs in storage and interest costs are not included as costs. They are treated as expenses of a period of the firm.

In case of manufacturing units, the valuation of inventory costs is more complex and involved. As a general rule all costs of materials, labour and plant facilities used for manufacturing the goods are included in the valuation of inventory.

In valuing inventory at lower of cost or market price, care should be taken to see that the valuation does not exceed the realisable value or selling price in the ordinary course of business.

Prepaid Expenses

In many situations, as a custom, some of the item of expenses are usually paid in advance such as rent, taxes, subscriptions and insurance. The rationale of including these prepayments as current assets is that if these prepayments were not made they would require use of cash during the period.

Fixed Assets

Fixed assets are tangible, relatively long-lived items owned by the business. The benefit of these assets are available not only in the accounting period in which the cost is incurred but over several accounting periods. Current assets provide benefits to the organisation by their exchange into cash. In the case of fixed assets, value addition arises by facilitating the process of production or trade. In other words, benefits from fixed assets are indirect rather than direct.

All man made things have limited life. In accounting we are concerned with the useful life of the assets. Useful life is the period for which a fixed asset could be economically used. This implies that the benefits from the fixed assets will flow to the organisation throughout its useful life. Another aspect of this is that the cost incurred in the period of purchase of the asset will be providing benefits over the useful life of the asset.

Valuation of the fixed assets is usually made on the basis of original cost. However, since assets have limited life the cost will be expiring with the expiration of the life. Thus, valuation of the asset is reduced by an amount proportionate to the expired life of the asset. Such expired cost is referred to as depreciation in accounting.

Fixed assets normally include assets such as land, building, plant, machinery and motor vehicles. All these items, with the exception of land, are depreciated. Land is not subject to depreciation and hence shown separately from other fixed assets.

Intangible and Other Assets

Intangible assets are assets or things of value without physical dimensions. They cannot be touched, they are incorporeal, representing intrinsic value without material being. One of the most common of these assets is **goodwill.** Goodwill reflects the ability of a firm to earn profits in excess of normal return. Almost all firms may have some goodwill. However, they appear in the books and balance sheet only when it has been purchased. Usually, when a going concern is purchased, the purchase price paid in excess of the fair value of the assets is considered goodwill. The amount is classified as another asset ‘goodwill’ on the balance sheet. Like fixed assets, the value of intangible assets should also be expired over a period of time. Such an expiration cost is called amortisation, similar to depreciation.

Current Liabilities

We have studied that **liabilities** are claims of outsiders against the business. In other words, these are amounts owed by the business to people who have lent money or

provided goods or services on credit. If these liabilities are due within an accounting period or the operating cycle of the business, they are classified as current liabilities. Most of such liabilities are incurred in the acquisition of materials or services forming part of the current assets. As was the case with current assets, current liabilities are also listed in the order of their relative liquidity.

Accounts Payable

Accounts Payable or sundry creditors are usually unsecured debts owed by the firm. These are also referred to as payables on open accounts. They may not be evidenced by any formal written acceptance or promise to pay. They represent credit purchase of goods or services for which payment has not been made as on the date of the balance sheet.

Accrued Liabilities

Accrued liabilities represent expenses or obligations incurred in the previous accounting period but the payment for the same will be made in the next period. In many cases where payments are made periodically, such as wages, rent and similar items, the last month's payment may appear as accrued liabilities (especially if the practice is to pay the same on the first working day of a month). This obligation shown on the balance sheet indicates that the firm owed the said amount on the balance sheet date.

Provisions or Estimated Liabilities

Where the liabilities are known but the amounts cannot be precisely determined, we estimate the liability and provide for it as a liability. A common example is **income tax payable**. Unless the tax liability is determined the amount payable cannot be accurately determined. There could be other examples too, such as product warranty expenses to be met and so on. The common practice is to estimate these liabilities based on past experience and make a provision for the same which is shown as a part of liabilities.

Contingent Liabilities

Contingent liabilities should be distinguished from estimated liabilities. Estimated liabilities are known liabilities where the amount is uncertain. Contingent liabilities on the other hand are not liabilities at the current moment. They may become liabilities only on the happening of a certain event. In other words, both the amount and the liability (or obligation) are uncertain till the specified event occurs in future. These may include items like a claim against the company **contested** in a court. Only if the court gives an unfavourable verdict, it becomes a liability. They are not listed as liabilities in the body of the balance sheet. However, if the firm wishes, it may make same provision for the same.

Long-Term Liabilities

Long-term liabilities are usually for more than one year. They cover almost all the outsider's liabilities not included in the **current liabilities** and **provisions**. These liabilities may be unsecured or secured. Security for long-term loans, are usually the fixed assets owned by the firm assigned to the lender by a pledge or mortgage. All details such as interest rate, repayment commitment and nature of security are disclosed in the balance sheet. Usually, such long-term liabilities include debentures and bonds, borrowings from financial institutions and banks.

Capital

We have seen earlier in this unit that the fundamental accounting equality states: **assets = liabilities + owners equity**. From the example of balance sheet we can easily establish this. See Ms. Naina's balance sheet:

Total assets	Rs. 1,00,00,000
Total liabilities	Rs. 60,00,000
Owner's equity	Rs. 40,00,000

We also know that the owner's equity consists of the contributed capital and the retained earnings of the firm. Therefore, capital is that part of owner's equity which is contributed by the owners. If Ms. Naina were an individual proprietorship business, the owner's equity will be reflected directly as:

Capital	Rs 40,00,000

If 'M/s. Naina' were a partnership firm with four partners W, X, Y and Z all sharing equally, the capital would be represented as:

Capital	Partner W	Rs. 10,00,000
	Partner X	Rs. 10,00,000
	Partner Y	Rs. 10,00,000
	Partner Z	Rs. 10,00,000
	Total	Rs. 40,00,000

Reserves and Surplus

Reserves and surplus or **retained earnings** normally arise out of profitable operations. It is a surplus not distributed by the firm as dividends. In other words, these are profits that are to be retained within the business. When a firm starts its operations it has no retained earnings. If in the first year it earns say Rs. 10,000 profit and decides to distribute Rs. 5,000 as dividends, the reserves and surplus at the end of the year will be Rs. 5,000. During its second year of operation if the firm makes a loss of Rs. 3,000 then the retained earnings at the end of the year will be Rs. 2,000. Retained earnings (or reserves and surplus) are in the nature of **earned capital** for the firm. We have seen earlier that the dividends are limited to retained earnings. This implies that at no point in time the original capital of the firm can be distributed as dividend. In other words, the capital originally contributed is to be maintained intact.

It is possible to allocate profits earned and accumulated as reserves or retained earnings to be earmarked for specific purposes. The earmarked reserves are not distributed. Only non-earmarked or **free reserves** are available for distribution as dividends.

☞ Check Your Progress 4

Fill in the blanks:

1) As a convention, items appearing on the balance sheet are listed in the order of their relative _____

2) Balance sheet could be presented either in
   a) _____ from, or
   b) _____

3) Operating cycle is the duration _____

4) Inventories are valued in the balance sheet by applying the principle of _____

5) Accounts receivable are also referred to as _____

6) Expired cost with respect to a fixed asset is referred to as _____ expense.

7) Expiration of cost of intangible assets is referred to as _____

8) Sundry creditors are also referred to as _____, _____

9) We judge an item as a current asset if it is converted into cash during an _____

10) Liquidity refers to nearness of an item to _____

11) Items classified as current assets are usually listed in the order of their relative _____

12) The basis of valuation as applied to temporary investment is _____

13) Asset losses expected out of non-collection of receivables are called _____

14) Formal written/documented debts refer to_____

15) Items commonly referred to as inventory include (i) _____, (ii) _____ and (iii) _____

16) Fixed Assets are valued on the basis of _____

17) Balance sheet is a statement of_____

18) _____ represents the owners' claim against assets of a business.

19) _____ are claims of outsiders against the business.

20) _____ increase owners' equity.

21) Amounts owed by a business on account of purchase of inventory are usually called _____ or _____.

22) Amounts receivable by a firm against credit sales are usually called _____

23) As a general rule all assets are valued at their _____ to the business.

24) Owner's equity could be understood as comprising two parts: _____ and _____

25) The dual aspect principle ensures an important equality reflected by balance sheet _____

26) All valuations specially those of fixed assets in a balance sheet are based on an important assumption about the entity as a _____.

1.8 ADJUSTMENT ENTRIES

Accounts are prepared as per accounting concepts, conventions and principles. Since final accounts are prepared on accrual basis, it becomes necessary to subtract all those expenses, which are basically paid during the current financial year although applicable to other accounting period(s). And to add all those expenses, which benefit the current accounting period either the payment was made or not. Similarly in case of earnings subtract all those revenue items, received in the current accounting period but applicable to other accounting period (s). Add all those revenue items, which have been earned currently but not yet been received. The above stated corrections in the final account are called Adjustments, which are made with the help of adjusting entries. Adjustments ensure a proper matching of costs and revenue for obtaining correct profit or loss for the given accounting period.

Let us see the treatment and impact of some adjustments on final account.

1.8.1 Closing Stock

The value of unsold stock. The stock is valued at cost or market price whichever is lower. Generally, the closing stock is not given in the trial balance but is given in adjustments. Closing stock will appear on the credit side of the trading account and will also appear on the assets side of the balance sheet.

1.8.2 Depreciation

It is the amount charged because of the usage and passage of time. Fixed assets are used for earning revenue. Therefore, a decrease in their value is considered to be the operational expenses of business. In order to ascertain true profits and to show the true value of the assets in the balance sheet, depreciation has to be charged. Depreciation account is debited while individual asset account is credited and then the profit and loss account is debited and the while depreciation accounts is credited.

1.8.3 Bad Debts

Bad debts are losses on account of uncollectable debts. When the amount due from debtors is irrecoverable, it is called bad debts. Bad debts, being loss are closed by transferring them to the debit side of the profit and loss account. The amount of bad debts is also deducted from debtors in the balance sheet. If the same appears in the trial balance, no adjustment entry is needed. In this case, debtors appear at their adjusted figure.

1.8.4 Provision for Bad and Doubtful Debts

A provision should be made in advance for those debts whose recovery is doubtful and to writing off bad debts. All enterprises, based on their past experience, create a provision for doubtful debts to meet such a loss when it happens. This is done for the purpose of reflecting the debtors in the balance sheet at their true value. Provisions for bad and doubtful debts appear on the debit side of the profit and loss account and at the credit side of the provision for bad debts account.

1.8.5 Outstanding Expenses (Liabilities)

Expenses are generally recorded only when they are paid. The failure to record an unpaid expenses in the accounts results in an understatement of that expense and also an understatement of a liability. In order to avoid understatement of these expenses and liabilitie, an adjustment entry is passed by debiting the expense account and, crediting the personal account of the party to whom such amount is to be paid. If outstanding expenses appear on the credit side of the trial balance, then they will be taken to the liability side of the balance sheet.

1.8.6 Prepaid Expenses (Assets)

Expenses paid in advance of their use or consumption are known as prepaid expenses. At the end of the year, a part of the payment remains unconsumed and is treated as an asset, because its benefit is to be availed of in future. For prepaid expense, the adjustment entry is made by debiting prepaid expense account and crediting expense account. If this item appears on the debit side of the trial balance, it will be shown only on the assets side of the balance sheet. It will not appear in Profit &Loss Account at all.

1.8.7 Accrued Income (Assets)

Accrued income is an amount earned but not actually received during the accounting period or till the date of preparation of final accounts for the period concerned. The first effect of accrued income is to credit the profit and loss account and to show the same in the assets side of the balance sheet.

1.8.8 Income Received in Advance (Liability)

It is the income received but not earned during the accounting period. In other words, it is the income for which services are to be rendered in future. This income is deducted from the concerned income in the credit side of profit and loss account and is also shown as a liability in the balance sheet.

To see the impact of adjustment entries' on the final account (financial condition of the business firm) let's take the same illustration of Ms. Naina again only including the some common adjustments in it. And let us check its impact practically by comparing the transactions of both the illustrations (with or without adjustment entries).

Revised Illustration 2:

The following figures from the trial balance has been extracted from the books of M/s. Naina Prepare the Trading and Profit & Loss Account for the year ended 31 March 2004.

	Debit (Rs.)	Credit (Rs.)
Drawings	35,000	
Building	60,000	
Debtors and Creditors	50,000	80,000
Returns	3,500	2,900
Purchases and Sales	3,00,000	4,65,000
Discount	7,100	5,100
Life Insurance	3,000	
Cash	30,000	
Stock (Opening)	12,000	
Bad Debts	5,000	
Reserves for Bad Debts	-	17,000
Carriage Inwards	6,200	
Wages	27,700	
Machinery	8,00,000	
Furniture	60,000	
Salaries	35,000	
Bank Commission	2,000	
Bills Receivable/Payable	60,000	40,000
Trade Expenses/Capital	13,500	9,00,000

Adjustment:

1. Stock on 31st March 2004 was valued at Rs. 50,000.
2. Depreciation of building 5%; furniture and machinery is 10% p.a.
3. Trade expenses Rs. 2,500 and wages Rs. 3,500 have not been paid as yet.

4. Allow interest on capital at 5% p.a.
5. Make provision for doubtful debts at 5%.
6. Machinery includes Rs. 2,00,000 of a machinery purchased on 31st December 2003. Wages include Rs. 5,700 spent on the installation of machine.

Solution

M/s. Naina
Trading and Profit & Loss Account
For the year ending on 31st March, 2004

		Rs.			Rs.
To Opening Stock		12,000	By Sales	4,65,000	
To Purchases	3,00,000		Less: Return	3,500	4,61,500
Less: Return	2,900	2,97,100			
To Wages	27,700				
Less: Installation Charges	5,700		By Closing Stock		
Add: Outstanding	3,500	25,500			50,000
To Carriage Inward		6,200			
To Gross Profit c/d		1,70,700			
		5,11,500			5,11,500
			By Gross Profit b/d		1,70,700
To Discount		7,100	By Discount Received		5,100
To Life Insurance		3,000	By Reserve for Bad and Doubtful Debts		17,000
To Salaries		35,000			
To Bank Commission		2,000			
To Trade Expenses	13,500				
Add: Outstanding	2,500				
		16,000			
To Bad Debts		5,000			
To Interest on Capital		45,000			
To Provision for Doubtful Debts		2,500			
To Depreciation on:		3,000			
Building		65,143			
Machine		6,000			
Furniture		3,057			
To Net Profit		1,92,800			1,92,800

Ms. Naina
Balance Sheet as on 31st March, 2002

Liabilities		**Rs.**	**Assets**		**Rs.**
Capital	9,00,000		Building	60,000	
+ Net profit	3,057		– Dep. @ 5%	3,000	57,000
+ int. on Capital	45,000				
– Drawings	35,000	9,13,057	Machinery	8,00,000	
			+ Wages	5,700	
Creditors		80,000	– Dep.	65,143	7,40,557
Outstanding Wages		3,500			
Bills Payable		40,000	Furniture	60,000	
Outstanding Trade Exp.		2,500	– Dep.	6,000	54,000
			Debtors	50,000	
			– Provision	2,500	47,500
			Stock		50,000
			Cash		30,000
			Bills Receivable		60,000
		10,39,057			10,39,057

Analyses of the above two Examples

Particular	Illustration 2	Revised Illustration 2
Wages	27,700	25,500
Gross Profit	1,68,500	1,70,700
Trade Expenses	13,500	16,000
Depreciation	Nil	74,570
Net Profit	1,11,000	2,630
Building	60,000	57,000
Machinery	8,00,000	7,40,557
Furniture	60,000	54,000
Debtors	50,000	47,500
Capital	9,90,000	9,12,630

The above table is self-explanatory. It shows clearly the importance of adjustment entries for a business firm and for all concerned parties of the same to ascertain the correct financial position of the enterprise.

☞ Check Your Progress 5

1) What is Trading Account? Distinguish between Trial Balance and Profit and Loss Account

2) Write short note on Final Accounts and Adjustments Entries.

3) What are Adjustments? What is the need of making adjustments while preparing Final Account?

4) Show the treatment of the following adjustments:

   a. Outstanding Expenses

   b. Depreciation

   c. Bad Debts

5) Prepare the trading account from the following figures of Mr. Deep on 31st March 2004.

Opening Stock	34,200
Purchases	1,02,000
Wages	34,500
Returns Outwards	1,740
Power	1,280
Factory Lighting	950
Manufacturing Ex.	9,500
Freight on Purchases	1,860
Sales	2,50,850
Sales Return	3,100

5) The following is the trial balance of Mr. Virat as at 31.03.2005

	Debit (Rs.)	Credit (Rs.)
Fixed Assets	3,00,000	
Debtors	75,000	
Opening Stock	2,05,000	
Bills Receivables	10,000	
12% Investments (1.7.1998)	50,000	
Cash in Hand	5,000	
Cash in Bank	10,000	
Drawings	10,000	
Purchases	5,25,000	
Sales Return	10,000	
Carriage Inwards	5,000	
Carriage Outwards	2,000	
Rent	3,000	
Insurance	3,600	
Office Expenses	13,200	
Discount Allowed	2,000	
Bad Debts	5,000	
Interest	2,500	
Selling Expenses	15,800	
Creditors		1,00,000
Bills Payable		5,600
Loan from Bank		4,000
Sales		6,30,000
Purchase Return		5,000
Discount		1,000

Adjustment:

1. Stock on 31st March 2005 was valued at Rs. 42,000.
2. Rent is payable at the rate of Rs. 300 p.m.
3. Insurance premium was paid for the year ending 30th June, 2005.
4. Interest on investment is payable half yearly on 30th June and 31st December.
5. Write off further bad debts Rs. 5000. Also create a provision for doubtful debts @ 10% on debtors and provision for discount on debtors @ 2%.
6. Create a reserve for discount on creditors @ 2%.
7. Provide for depreciation on fixed assets @ 10%.

Prepare the Trading and Profit and Loss Account for the year ended and Balance Sheet as on 31st March 2005.

6) On 31st March 2004 the following trial balance of Sanjeev Tomar was taken out. Prepare final account for the year after making the following adjustments.

1. Depreciation: 5% of plant and machinery and 10% of fixtures and fittings.
2. Reserve for bad debts 2.5% on Sundry Debtors
3. Insurance unexpired on 31st March 2004 Rs. 70
4. Outstanding wages Rs. 800 and Salaries Rs. 350.

Plant and Machinery	55,000
Fixtures and Fittings	1,720
Factory Fuel and Power	542
Office Salaries	3,745
Lighting (Factory)	392
Travelling Expenses	925
Carriage on Sales	960
Cash in Bank	2,245
Sundry Debtors	47,800
Purchases (Adjusted)	66,710
Wages	9,915
Rent and Taxes	1,915
Office Expenses	2,778
Carriage on Purchase	897
Discount	422
Drawings	6820
Stock 1 April 2003	21,725
Manufacturing Expenses	2,680
Sales Return	7,422
Insurance	570
Closing Stock	16,580
Rent Outstancing	150
Sanjeev's Capital	93,230
Sales	1,26,177
Sundry Creditors	22,680
Purchase Return	3,172
Bills Payable	6,422

1.9 SUMMARY

Both the parts, Trading Account and Profit and Loss Account, of Final Account are interdependent on each other. Gross Profit/loss plays a very special role in the calculation of net Profit and loss figure. Trading and profit and loss account gives the true picture of an organisation by showing its revenues and expenses. This account is normally prepared at the end of the accounting period. Balance Sheet as we have seen is one of the most important financial statements. It is a periodic summary of the financial position of the business. It is the statement of assets, liabilities and owners' capital at a particular point in time. This statement in itself does not reveal anything about the details of the operations of the business. However, a comparison of two balance sheets could reveal the changes in business position. A realistic understanding of the operations of the business would require two other statements — Cash Flow Statement and Funds Flow Statement. We shall take them up in subsequent units.

1.10 KEY WORDS

Asset: Anything, tangible or intangible, of monetary value to a business entity; something which a business entity owns.

Current Assets: All the assets held by a firm with the objective of conversion to cash within the operating cycle or within one year whichever is longer. Current Assets include items such as cash, receivables, inventory and prepayments.

Current Liabilities: All those claims against the assets of the firm to be met out of cash or other current assets within one year or within the operating cycle, whichever is longer. Usually include items such as accounts payable, tax or other claims payable, and accrued expenses.

Contingent Liability: A liability which has not been recognised as such by the entity. It becomes a liability only on the happening of a certain future event. An example could be the liability which may arise out of a pending lawsuit.

Fixed Asset: Tangible long-lived asset. Usually having a life of more than one year. Includes items such as land, building, plant, machinery, motor vehicles, furniture and fixtures.

Intangible Assets: Any long-term assets useful to the business and having no physical characteristics. Include items such as goodwill, patents, franchises, formation expenses and copyrights.

Liability: Any amount owed by one person (the debtor) to another (the creditor). In a balance sheet all those claims against the assets of the entity, other than those of the owners.

Owner's Equity: It is the owner's claim against the assets of a business entity. It could be expressed as total assets of an entity less claims of outsiders or liabilities, including both contributed capital and retained earnings.

1.11 SOLUTIONS / ANSWERS

Check Your Progress 1

1) Gross Profit Rs. 86,000

2) Net purchase is the difference between purchases and the purchase return

3) Net sales is the difference between sales and the sales return

Check Your Progress 2

4) Gross Profit Rs. 30,000 and Net Profit Rs. 10,600

Check Your Progress 3

1) (a) accounting period (b) fiscal year (c) financial year

2) (a) asset (b) liability (c) capital

3) (a) current (b) property, plant (c) other

4) (a) current (b) long-term (c) shareholders.

Check Your Progress 4

1) Liquidity

2) (a) T account form (b) Report form

3) Is time taken by a unit to convert goods into sales and to collect money from debtors?
4) Lower of cost or market price

5) Sundry debtors

6) Depreciation

7) Amortisation

8) Accounts payable

9) Operating cycle or accounting year

10) Cash

11) Liquidity

12) 'Lower of cost or market price'.

13) Bad debts.

14) Promissory Notes receivable or bills receivable.

15) Raw material (ii) Work-in-Process (iii) Finished goods.

16) Historical cost, less Depreciation.

17) Assets, Liabilities and capital

18) Owners' equity

19) Liabilities

20) Profits

21) Accounts payable or sundry creditors

22) Accounts receivable or sundry debtor

23) Original cost

24) Contributed capital and retained earnings

25) Assets = Liabilities + Owner's Equity

26) Going concern.

Check Your Progress 5

4) a. Expense Account Dr. (It will go to trading or profit & loss A/c)
To Outstanding Expenses Account

b. Depreciation Account Dr.
To individual Asset Account
Profit and Loss Account Dr.
To Depreciation Account

c. Bad Debts Account Dr.
To Debtors Account

5) Gross Profit Rs. 62,000 and Net Loss Rs. 32,400

6) Gross Profit Rs. 62,000 and Net Loss Rs. 32,400

7) Balance Sheet total Rs. 1,19,366. Net Profit Rs. 2,554, Gross Profit Rs. 18,266.

1.12 FURTHER READINGS

1. *Financial Accounting*, Dr. R.K. Sharma and Dr. R.S. Popli, Kitab Mahal, 2005.

2. *Basic Financial Accountinmng*, J.R. Monga, Girish Ahuja, Mayur Paperbacks, 2001.

3. *Financial Accounting,* Horngren C.T. and Harrison, *01/23/2003*, Prentice Hall: New Delhi (Chapter 1).

4. *Understanding Financial Statements*, Fraser Lyn M. and Aileen Ormiston, 04/10/2003, Prentice Hall: New Delhi (Chapter 2).

5. Basic Accounting Practice, Glantier M. W. E., Underdown B. and A.C. Clark, 1979, Arnold Hieneman: Vikas Publishing House, New Delhi (Chapter 5, Section 2).

6. *Accounting For Management: Text and Cases,* Bhattacharya, S. K. and John Dearden, 1984. (2nd Ed) Vani: New Delhi. (Chapter 3, 10 and 11).

7. *Management Accounting,* Hingorani, N.L. and A. R. Ramanathan, 1986, Sultan Chand: New Delhi. (Chapter 3).

UNIT 2 CONSTRUCTION AND ANALYSIS OF FUND FLOW AND CASH FLOW STATEMENTS

Structure **Page Nos.**

2.0 INTRODUCTION

Depending on the user's purpose, the term 'funds' may be used differently. Literally, it means a supply that can be drawn upon. In this sense it is used to mean cash, total current assets or working capital. We use it here in the sense of networking capital meaning **total current assets less current liabilities**.

Funds flow is used to refer to changes in or movement of current assets and current liabilities. This movement is of vital importance in understanding and managing the operations of a business.

We have seen in the unit dealing with balance sheet that every material transaction changes the position statement (or Balance Sheet). This, in other words implies a dynamic situation involving continuous movement of resources into the business, within the business and out of the business. The complexity of these flows increases with the increasing size and volume of business. Directly or indirectly, all these flows take place in business through the medium of **funds** and the same could be studied through the fund flow statement.

Funds in the form of cash and cash equivalents, in the right quantity are necessary for the smooth functioning of any business. The continuous movement of cash within the business and out of the business could be understood by studying the cash flow statement.

2.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the idea of funds flowing through a business in a dynamic situation appreciate the role of working capital in the operations of a business;

- understand the sources and uses of working capital as well as cash during an accounting period from the financial statements;
- understand and interpret changes in working capital and cash identifying the causes of these changes; and
- use the funds flow statement and the cash flow statement as analytical tools.

2.2 STATEMENTS OF CHANGES IN FINANCIAL POSITIONS (SCFP)

Preparation of funds statement, excludes all those inter-firm activities of the enterprise, which do not affect its net working capital. Consequently, many of its significant activities like exchange of one or more current item (non current asset or non-current liability) with any other non-current item remains altogether unreported. No trace can be found from the funds flow statement even for the partial or total acquisition of non-current items of an enterprise in consideration of shares or/and debentures of any magnitude. To incorporate all these 'inter-firm non-current exchange transactions', which may substantially influence future funds, an all-pervasive flow statement, termed statement of changes in financial position is constructed.

The Institute of Chartered Accountants of India's (ICAI's) Accounting Standards – 3 (AS3) defines SCFD as : A "Statement of changes in financial position" summarising, for the period covered by it, the changes in the financial position including the sources from which funds were obtained by the enterprise and the specific uses to which such funds were applied.

According to **E.S.Hendrisen:** *one of the basic objections to the working capital concept of funds is that inter-firm transactions do not directly affect working capital and as such they are omitted from the funds flow statements. Thus, it does not provide correct or compete financial structure of the firm. A suggestive solution of the above stated problem is an all resources concept of funds, which would permit the inclusion of such transactions as the acquisition of property in exchange of stock or bonds, the receipt of property as a gift, and the exchange of non-current assets for other non-current items.* (Accounting theory, 19877 Ed.p.250).

Similar to funds flow statement, SCFP is also prepared from financial data like income statement, balance sheet, etc., and related notes. There is no specific format prescribed for the preparation SCFP. Where SCFP is supposed to be most informative, in those circumstances, it should be:

1) presented for each period for which the final accounts are prepared;
2) included as an integral part of the financial statements;
3) specific about where funds are provided from or used in the operations of an enterprise; and they should be presented separately from other sources or uses of funds other than those of operations.

Thus, SCFP, is designed to report all the causes of changes in financial position of an entity during the period that result from its financing and investing activities with others. Besides explaining the inflows and outflows of funds, it also reveals non-current external exchange transactions, which do not directly affect working capital. It thus, improves the understanding of the operations and activities of an enterprise for the related period.

2.3 ANALYSING CHANGES IN WORKING CAPITAL

In understanding the financial statements of a company, one of the first steps involved is the study of the changes in the financial position of the company and the reasons for the changes. We make an attempt at studying these changes and their causes by using the data contained in the summarised comparative balance sheets (Illustration 6.2) and profit and loss account of Tools India Limited (TIL).

Illustration 6.2

Tools India Limited
Balance Sheet as on December 31, 2004

(Rs. in Million)

Assets	**December 31, 2004**		**December 31, 2003**	
	Rs.	**Rs.**	**Rs.**	**Rs.**
Current Assets				
Cash	19.05		10.87	
Accounts Receivable (Sundry debtors)	32.25		20.28	
Loans and Advances	42.58		33.82	
Other Current Assets	17.20		15.93	
Inventory	120.92		99.10	
Total Current Assets		232.00		180.00
Fixed Assets				
Plant and Equipment at Cost	152.00		133.00	
Less: Depreciation	71.00	81.00	60.00	73.00
Furniture & Fixture at Cost	14.50		8.60	
Less: Depreciation	2.00	12.50	2.30	6.30
Investments		2.00		
Intangible Assets				
Technical Assistance Fees	3.00		1.00	
Less: Amortisation	0.50	2.50	0.30	0.70
Total		330.00		260.00
Liabilities and Capital				
Current Liabilities				
Acceptance	4.74		3.02	
Sundry Creditors (Accounts Payable)	27.16		18.75	
Advances against Sales	26.60		20.28	
Other Liabilities	8.86		7.95	
Interest Accrued but not Due on Loans	2.64		2.00	
		70.00		52.00
Provisions				
For Taxation	25.55		20.45	
Proposed Dividend	2.25		2.25	
For Bonus	3.40		2.35	
Other Provision	3.80		2.95	
		35.00		28.00
Total Current Liabilities & Provisions		105.00		80.00
Long Term Liabilities				

Bank Loans	40.00		32.14	
10.5% Debentures	25.50		25.50	
Loans from Financial Institutions	24.50		22.36	
		90.00		80.00
Total Liabilities		195.00		160.00
Capital				
Authorised : 5,00,000 shares of Rs.100 each	50.00		50.00	
Issued, Subscribed and Paid-up 3,73,100 Shares of Rs. 100 each		37.31		37.31
Reserves and Surplus		97.69		62.69
Total		330.00		260.00

As we have studied at the beginning of this unit, the net change in working capital can be computed easily by subtracting the net working capital at the end of the year from the net working capital at the beginning of the year.

TOOLS INDIA LTD
Change in Working Capital

(Rs. in Million)

	December 31, 2002	**December 31, 2003**
Current assets	180.00	232.00
Less: Current Liabilities	80.00	105.00
Working Capital	100.00	127.00

Working capital on December 31, 2004	127.00	
Working Capital on December 31, 2003	100.00	
Increase in Working Capital	27.00	

The Rs. 27 million increase in working capital of TIL shows the composite changes in the Current assets and current liability. This does not tell us much in terms of the operations of the business. This change could be the net result of changes in all the accounts covered by current items. There might have been qualitative changes resulting from the depletion of liquid items of current assets and increase in non-liquid items such as inventory. In order to answer these questions we try to analyse the changes in each of the working capital accounts.

Statement of Changes in Working Capital

A statement of changes in working capital helps us in locating where these changes took place. In the first instance we try to show the increase (decrease) in individual items and then try to classify them in terms of increase and decrease in working capital. Since working capital is measured by subtracting current liabilities from current assets, any **increase** in current assets and any **decrease** in current liabilities shows an **increase** in working capital. Similarly, a **decrease** in current assets and an **increase** in current liabilities represents a **decrease** in working capital.
The statement of changes in working capital (Table 6.1) shows that the increases in current assets amounted to Rs. 52 million, a major part of the increase arising out of cash, receivable and inventory. Decrease in working capital came about mostly from

the increased accounts payable, advances from customers and taxes payable. Total amount of decrease in working capital resulting from increase in current liabilities amounted to Rs. 25 million, thus, showing a net increase in working capital of Rs. 27 million.

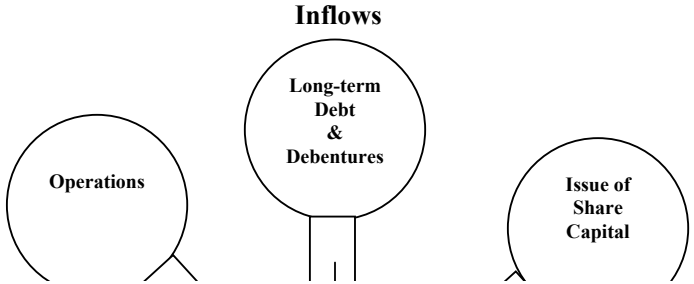
Table 6.1
TOOLS INDIA LTD.
Statement of changes in Working Capital for the year ending December 31, 2003
(Rs. in Million)

	Dec. 31 2004	Dec. 31 2003	Increase / Decrease	Working Capital	
				Increase	Decrease
Current Assets					
Cash	19.05	10.87	8.18	8.18	
Accounts Receivable	32.25	20.28	11.97	11.97	
Loans and Advances	42.58	33.82	8.76	8.76	
Other Current Assets	17.20	15.93	1.27	1.27	
Inventory	120.92	99.10	21.82	21.82	
Total	232.00	180.00	52.00		
Current Liabilities & Provisions					
Acceptances	4.74	3.02	(1.72)		1.72
Accounts Payable	27.16	18.75	(8.41)		8.41
Advances against Sales	26.60	20.28	(6.32)		6.32
Other Liabilities	8.86	7.95	(0.91)		0.91
Interest Accrued	2.64	2.00	(0.64)		0.64
Taxes Payable	25.55	20.45	(5.10)		5.10
Proposed Dividend	2.25	2.25	–		–
Bonus Payable	3.40	2.35	(1.05)		1.05
Other Provisions	3.80	2.95	(0.85)		0.85
Total	105.00	80.00	(25.00)	52.00	25.00
Working Capital	127.00	100.00		27.00	
Increase in Working Capital	27.00				

2.4 FUND FLOW STATEMENT

An analysis of the fluctuations of current assets and current liabilities i.e. working capital tells us how the working capital has increased or decreased. Now, we want to know where the increased working capital is applied if it has increased, and from where funds have been transferred if it has decreased. The profit and loss account gives some indication of the results of operations and its impact on the funds position. We try to integrate the impact of operations reported in the profit and loss account and balance sheet by preparing a statement of changes in the financial position. It describes the sources from which funds were received and the uses to which funds were put. This statement of changes in financial position is usually referred to as **fund flow statement** or statement of sources and application of funds.

As the title indicates fund flow statement traces the flows of funds through the organisation. In other words, it shows the sources from where the funds were raised and the uses to which they were put.



The statement of funds flow is usually bifurcated into two logical divisions: **sources of funds** or inflows during the periods and **uses of funds** or applications of funds or outflows of funds during the period. The division showing sources of funds summarises all those transactions, which had the net effect of increasing working capital. Uses of funds on the other hand deal with all those transactions, which had the effect of decreasing the working capital. We shall illustrate the primary structure of flows in *Figure 6.1*

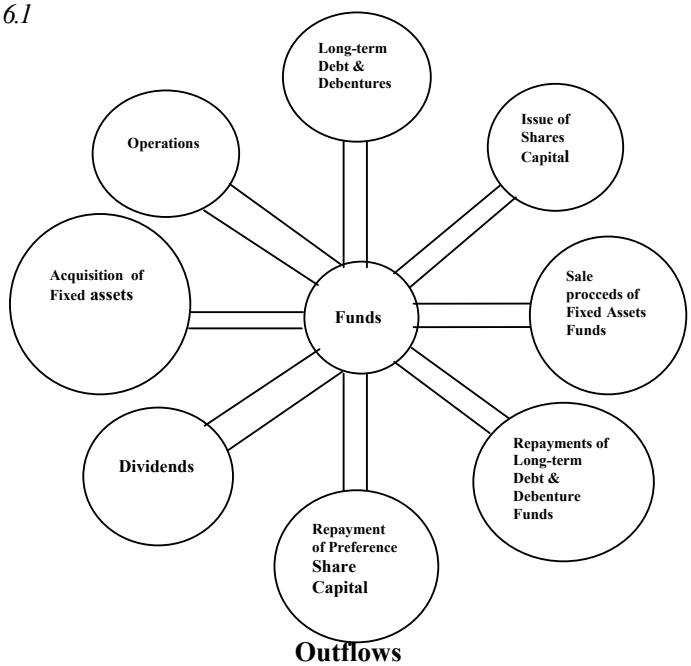


Figure 6.1: Basic Flow of Funds

The **flow of funds** statement gives a summary of the impacts of various managerial decisions. As such it reflects the policies of financing, investment, acquisition and retirement of fixed assets, distribution of profits, and the success of operations.

☞ **Check Your Progress 1**

1) Please list the four main sources of funds in an organisation.

.....

.....

.....

2) List the four main uses of funds in an organisation.

.....

.....

.....

2.5 SOURCES OF FUNDS

We have seen that working capital is required to finance that portion of current assets which is not financed by current liabilities. We also saw that the investments represented by current assets are converted into cash during the operating cycle. This implies that our need for financing is for one such cycle. Under normal circumstances every unit of investment in working capital is converted into cash at the end of the cycle at an added value, to the extent of profits.

When we are looking at the possible sources of working capital the most important source is this 'internal generation'. The very idea of internal sources implies that there is something 'external'.

Internal Sources

When we are looking for sources funds it is but natural to start searching at home. What do we have? While examining the need for working capital we could also make an assessment as to whether the existing working capital is sufficient or not. Thus, the first internal source is any excess working capital that we might be having.

If we have any non-current assets which do not have any use they could be disposed off, thereby generating additional working capital. Please note that this is not a regular and continuing source of funds.

We have seen earlier that every profitable sale brings with it funds in excess of what was expended on the goods sold. In other words, profits generated by the business contribute towards additional working capital. But you may also notice that whenever we measure profits, we match the revenue against all expenses relating to the revenue, whether it involves use of funds in the current period or not. Thus, the profits measured do not reflect the actual amount of funds available. In order to assess the actual funds generated from current operations we should add, back, to the profits all those items of expenses not involving use of funds during the current period. One major example of such an item is depreciation.

Thus, we could summarise the important possible inter sources of funds as:

1) Funds generated from operations. That is, profit plus depreciation and other amortisations; and some other adjustments;
2) sale of non-current assets;
3) any surplus working capital.

Funds From Operations

Refer to Illustration 6.1. The profit and loss account of TIL shows that operations have provided a gross addition of Rs. 360 million to funds during the period. These funds represent the sale proceeds of goods and services by the company and other incomes.

We also know that some part of these funds is utilised for meeting the cost of input such as material, personnel and other operating costs. Apart from these we also to meet the interest commitments and costs expiration of the machinery and equipment. However, expiration of the costs of the machinery and equipment (Depreciation) is one item which does not require use of funds in the current period.

Illustration 6.1

TOOLS INDIA LTD.
Summarised Profit and Loss Account
For the year ended December 31, 2004

		(Rs. in Million)
		Rs.
Sales		350
Other Income*		10
		360
Costs of Goods Sold		150
Gross Profit		210
Operating Expenses:		
Personal	60.00	
Depreciation and Amortisation	11.90	
Other Expenses	13.10	85
Operating Profit		125
Less: Interest Expense		15
Net Profit before Income Taxes		110
Less: Provision for Taxes		55
Net Profit		55
Less: Dividends		20
Net Profit Retained		Rs. 35

* Other income includes Rs. 1 million profit on sale of furniture.

Thus, funds provided from operations are in fact the revenues earned from operations (as also non-operating incomes) less all immediate costs of goods sold requiring use of funds. In other words, it is net income or profit after taxes plus all the non-fund expenses, such as depreciation and amortisation and adjusted for non-operating incomes and expenses.

The following statement would show funds from operations of TIL as follows:

	(Rs. in Million)
Operations	
Net Profit	55
Add: Depreciation and Amortisation (non-fund)	11.90

	66.90
Less: Profit on the Sale of Furniture (non-operating)	1.00
Total funds provided from operations	65.90

External Sources

External sources of funds are resources raised from outside the organisation to augment funds availability for any of the uses to be discussed later. Normally, there are only two ways of doing this:

1) by contributing or raising additional capital, and
2) by increased long-term borrowing.

Please note that short-term creditors are not included as a source of funds since we have already defined funds as "current assets less current liabilities". Thus, working capital represents long-term investment in current assets and hence short-term borrowing will not increase working capital.

The sources of funds, as usually presented in the fund flow statement, are enumerated below:

Sources of Funds

Operations:		
Net Profit after taxes	_____	
Add: Depreciation	_____	
Other amortisations	_____	
Funds Provided by Operations		_____
New Issue of Share Capital		_____
New Issue of Debentures/Bonds		_____
Additional long-term Borrowing		_____
Sale Proceeds of Fixed Assets		_____
Sale of long-term Investments		_____

☞ Check Your Progress 2

1) Please put down what 'internal' and 'external' sources are:

.....

.....

..... ……..

2.6 USES (APPLICATIONS) OF FUNDS

Need for Additional Funds

A business would require Additional funds for two purposes:

1) Financing additional fixed assets, and
2) Financing additional working capital.

It should not be difficult to appreciate the necessity for having adequate fixed facilities with which to conduct business. The amount we have invested in the shop, furniture and fixtures has created the facilities for carrying on the business. It also determines the capacity to produce and to provide services. We cannot expand our business beyond a certain capacity which is limited by the facilities created by fixed assets. In case of a manufacturing firm, it will be plant capacity; in case of a transport

undertaking it may be tonnage of trucks, ships or wagons; in case of show business and airlines it may be seating capacity, and so on. Any increase in such capacity would require additional investment. Thus, investment in fixed assets is required to expand capacity or to improve current operation. Usually, additions to investments are judged on the basis of its ability to reduce the present costs or to increase present output.

Additional working capital is required to finance increased holding of inventory, increased credit to customers and increased cash holding requirements. Obviously, current creditors would finance part of this requirement for working capital.

If a firm invests in another shop or in expansion of the existing shop, they will require additional funds for investment in fixed assets and also for increased level of current assets. You will notice that whenever additional investment is to be made in non-current assets, we have to use the funds (working capital) available with us unless separate arrangement is made for their financing. Likewise, when non-current assets are sold they provide funds or result in sources of funds.

We could summarise the usual applications of funds as follows:

1) Acquisition of new non-current assets (fixed assets)
2) Replacement of non-current debt (loans)
3) Payment of dividends
4) Increase in the balance of working capital (current assets–current liabilities).

If the trading or business operations are unsuccessful, they may use funds rather than provide funds. The uses of funds, as they are usually presented in the fund flow statement, are enumerated below:

USES OF FUNDS

Dividends	……..
Redemption of Redeemable Preference Share Capital	……..
Repayment of Debentures/Bonds	……..
Repayment of Long-Term Loans	……..
Purchase of Fixed Assets	……..
Purchase of Long-Term-Investment	……..
Increase in Working Capital	

☞ Check Your Progress 3

1) Please put down the list of application of funds.

.....

.....

2.7 PREPARATION OF FUND FLOW STATEMENT

Let us further extend illustration 6.2 in order to prepare a Fund Flow Statement. From a comparative balance sheet and profit and loss account we could obtain most of the information we require for the preparation of a fund flow statement. We have studied that changes in the net-working capital amount are caused by the changes in non-working capital items. This may be seen from the summarised balance sheet of TIL *(Table 6.2).*

We have seen that the net working capital amount increased by Rs. 27 million during 2004, January 1 to December 31. This is other words implies that the

working capital from **non-current sources** should exceed **non-current uses** by Rs. 27 million.

The summarised balance sheet shows the net change in each account. That is, it does not show the increases and decreases separately. Furniture and fixtures value, for example, has increased by a net amount of Rs. 5.90 million. This increase shows an application of funds. In reality, this account was both a source and an application of funds. We purchased new furniture and fixtures worth Rs. 7.90 million (a use of funds) and sold existing furniture and fixtures which had an original cost of Rs. 2 million and on which depreciation had accumulated to the tune of Rs. 1 million (a source of funds). Since the purchase transaction was bigger in amount than the sale transaction, the net result was in the 'use of funds'.

Table 6.2
TOOLS INDIA LTD.
Summarised Balance Sheet

(Rs. in Millions)

	December 31, 2004	December 31, 2003	Change in Working Capital	
			Source	Use
Working Capital	127.00	100.00		27.00
Fixed Assets				
Plant and Equipment at Cost	152.00	133.00		19.00
Furniture and Fxtures at Cost	14.50	8.60		5.90
Investments	2.00			2.00
Intangible Assets				
Technical Assistance Fees at Cost	3.00	1.00		2.00
	298.50	242.60		
Long-term Liabilities				
Bank Loans	40.00	32.14	7.86	
10.5% Debentures	25.50	25.50		
Loans from Financial Institutions	24.50	22.36	2.14	
Allowance and Amortisations				
Accumulated Depreciation				
Plant and Equipment	71.00	60.00	11.00	
Furniture and Fixtures	2.00	2.30		0.30
Amortisation of Technical Assistance Fees	0.50	0.30	0.20	
Capital				
Share Capital	37.31	37.31		
Reserves & Surplus	97.69	62.69	35.00	
	298.50	242.60	56.20	56.20

Notes: 1) Furniture and fixtures costing Rs. 2 million with an accumulated depreciation of Rs. 1 million is sold for cash at Rs. 2 million.

2) Dividend paid during the year amounted to Rs. 2.25 million.

If we are to construct a statement showing sources and uses of funds during the year, we need additional information. Some of this additional information is available from

the profit and loss account and the appropriation of net income. Some other information like sales proceeds of assets will have to be obtained from the other records of the company.

Funds Flow statement

		(Rs. in Million)
Sources of Funds		
Funds from Operations:		
Net Income*	37.25	
Less Profit on Sale of Furniture	1.00	
	36.25	
Add: Depreciation, Amortisation, Provisions:		
Plant	11.00	
Furniture	.70	
Technical Assistance Fee	.20	
		48.15
Other Sources of Fund		
Sale of Assets	2.00	
Bank Loan	7.86	
Institutional Loan	2.14	12.00
		60.15
Uses of Funds		
Payment of Dividends	2.25	
Purchase of Plant	19.00	
Purchase of Furniture	7.90	
Investments	2.00	
Technical Assistance Fees	2.00	
Increase of Working Capital	27.00	60.15

* Net income has been obtained by deducting the previous year's balance of Reserves and Surplus from the current year's balance i.e. 97.69 minus 62.69=35 million. To this, the proposed dividend for the current year of Rs. 2.25 million has been added (as it must have been taken into account while determining the net income to be transferred to Reserves and Surplus).

With the necessary background on Profit and Loss Account and Fund Flow Statement having been prepared, you can now watch the Video Programme **"Understanding Financial Statement-Part II"** at your study centre.

2.8 CASH FLOW STATEMENT

Cash is another form of fund although in a narrow sense, it refers to a supply that can be drawn upon, according, to the need. Here the term cash includes both cash and cash equivalents. Cash equivalents are highly liquid short-term investments which could be easily converted into cash without much delay.

It may however be appreciated that the obligations and liabilities of a business arising on a day-to-day basis are met through "Cash" or "Cheque". But, inreality it never happens. Further, we must also be able to distinguish between "Profit" and "Cash". One cannot pay the creditors, electricity bills, tax or even dividend with the "Net Profit". For such and many other purposes, a business needs either cash balance or credit limits with banks. Not to be able to meet the business comitments through cash

as and when these arise can spell disaster for a business even if it has a strong working capital base and has earned a handsome profit.

So far we have seen that the balance sheet and profit and loss account provide information on the financial position and the results of operations in a financial period. The funds flow statement explained earlier traces the flow of funds through the organisation. But neither of these financial statements can provide information about the cash flows relating to operating, financing and investing activities.

To ensure that the right quantity of cash is available in accordance with the needs of a business it is necessary to make a "cash planning" by determining the amount of cash entering the business (cash inflow) and the cash leaving the business (cash outflow). The statement which explains the changes that take place in cash position between two periods is called the cash flow statement.

Cash flow statement is an important tool in the hands of the management for short term planning and coordinating of various operations and projecting the cash flows for the future. It presents a complete view on the movement of cash and identifies the sources from which cash can be acquired when needed. The comparison of the actual cash flow statement with the projected cash flow statement helps in understanding the trends of the movement of cash and also the reasons for the success or failure of cash planning.

Cash flow and fund flow statements are similar to each other in many respects. The main difference however, lies in the fact that the terms "fund" and "cash" import different meaning. The term "fund" in fund flow statement has a wide meaning and it means current assets – current liability. A fund flow statement examines the impact of changes in fund's position during the period under review on the working capital of the concern (working capital refers to current assets - current liabilities). Cash in the cash flow statement refers only to cash and or balance with bank, i.e., a small part of the total fund, although very important. The cash flow statement starts with the opening cash balance, shows the sources from where additional cash was received and also the uses to which cash was put and ends up showing the closing balance as at the end of the year or period under review. Whereas, there are no opening and closing balances in Funds Flow statement. Increase in current assets or decrease in current liabilities increases the working capital, whereas the decrease in current assets or increase in current liabilities increases the cash flow.

2.9 SOURCES AND USES OF CASH

A cash flow statement is a financial report that describes the source of a company's cash and how it was spent over a specified period of time. Because of the varied accrual accounting methods companies may employ, it is possible for a company to show profits while not having enough cash to sustain operations. A cash flow statement neutralises the impact of the accused/accrual entries on the other financial statements. It also categorises the sources and uses of cash to provide the reader with an understanding of the amount of cash a company generates and uses in its operations, as opposed to the amount of cash provided by sources outside the company, such as borrowed funds or funds from stockholders. The cash flow statement also tells the reader how much money was spent for items that do not appear on the income statement, such as loan repayments, long-term asset purchases, and payment of cash dividends.

Cash flow statements classify cash receipts and payments according to where they stem from. These can be classified under three broad categories, i.e., **Operating Activities, Investing Activities** and **Financing Activities.** A brief discussion of each of these categories is given below:

Operating Activities include cash inflows associated with sales, rendering of services and the cash outflows associated with operating expenses including payments to suppliers of goods or services, payments towards wages, interest and taxes, etc. Increase or decrease in current assets, e.g., receivables, inventory as well as increase or decrease in current liabilities, e.g., accounts payable, wages payable, interest payable, taxes payable also reflect operating activities.

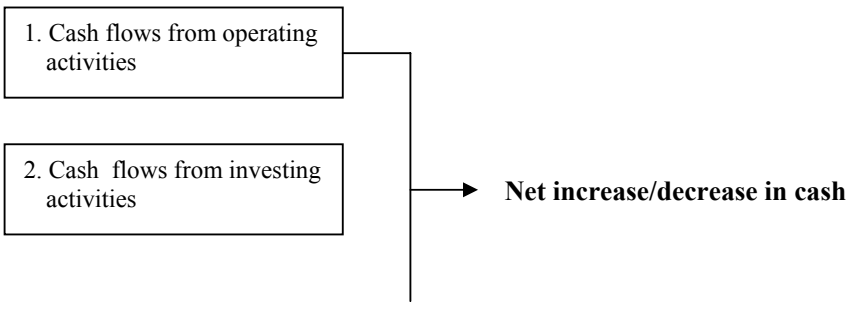
Investing Activities refer to acqisition and sale of fixed assets like land and building, plant and machinery etc. and buying and selling of investments. Acquisitions of these assets imply cash outflow whereas their disposal means inflow of cash.

Financing Activities encompass changes in equity and preference capital, debentures, long term loans and similar items. Issuance of equity, preference and debenture capital as well as raising of long term loans imply cash inflow. Retirement of capital, dividend payments to shareholders, redemption of debentures, amortisation of long term loans, on the other hand are associated with cash outflow.

The results from each section are added together to compute the net increase or decrease in cash flow for the firm. The format of the cash flows statement is given below:

Cash Flows from Operations		
Net Profit		**XXX**
Add: Any deducted non-cash item		
Depreciation	XX	
Loss on disposal	XX	
Decrease in current assets	XX	
Increase in current liabilities	XX	XXX
Less: any added non-cash item		
Gain on disposal	(XX)	
Increase in current assets	(XX)	
Decrease in current liabilities	(XX)	(XX)
Net Cash flows from Operations		**XXX**
Cash Flows from Investment		
Proceeds from disposal of assets		XXX
Dividend received		XX
Purchase of assets		(XX)
Net Cash flows from Investment		XXX
Cash Flows from Financing		
Dividends paid		(XX)
Issuance of stocks		XXX
Increase in notes payables		X
Increase in long term debt		XX
Net Cash flows from Financing		XXX
Increase in Cash and Marketable Securities		XXX
Beginning Cash and Marketable securities		XX
Ending Cash and Marketable securities		XX
Change in Actual Cash Balance		XXX

The summarised cash statement is:



3. Cash flows from financing activities

2.10 PREPARATION OF CASH FLOW STATEMENT

To start with, we need two successive balance sheets and the operating statement or profit and loss account linking the two balance sheets.

There are two ways in which this statement can be drawn up. The first method is the direct method whereby major classes of gross cash receipts and gross cash payments are disclosed. The second method is known as the short-cut or indirect method. Under this method net profit or loss is taken as the basis and adjusted for the effects of transactions of non-cash nature, changes in current assets and current liabilities and transactions of income or expenses associated with financial cash flows.

Direct Method

Under the direct method, you are basically analysing your cash and bank accounts to identify cash flows during the period. You could use a detailed general ledger report showing all the entries to the cash and bank accounts, or you could use the cash receipts and disbursements journals. You would then determine the offsetting entry for each cash entry in order to determine where each cash movement should be reported on the cash flow statement.

Another way to determine cash flows under the direct method is to prepare a worksheet for each major line item, and eliminate the effects of accrual basis accounting in order to arrive at the net cash effect for that particular line item for the period. Some examples for the operating activities section include:

Cash Receipts from Customers:

- Net sales per the Income Statement
- Plus beginning Balance in Accounts Receivable
- Minus ending Balance in Accounts Receivable
- Equals Cash Receipts from Customers

Cash Payments for Inventory:

- Ending Inventory
- Minus Beginning Inventory
- Plus Beginning Balance in Accounts Payable to Vendors
- Minus Ending Balance in Accounts Payable to Vendors
- Equals Cash Payments for Inventory

Cash Paid to Employees:

- Salaries and Wages per the Income Statement
- Plus Beginning Balance in Salaries and Wages Payable
- Minus Ending Balance in salaries and Wages Payable
- Equals Cash Paid to Employees

Cash Paid for Operating Expenses:

- Operating Expenses per the Income Statement

- Minus Depreciation Expenses
- Plus Increase or Minus Decrease in Prepaid Expenses
- Plus Decrease or Minus Increase in Accrued Expenses
- Equals Cash Paid for Operating Expenses

Taxes paid:

- Tax Expense per the Income Statement
- Plus Beginning Balance in Taxes Payable
- Minus Ending Balance in Taxes Payable
- Equals Taxes Paid

Interest paid:

- Interest Expense per the Income Statement
- Plus Beginning Balance in Interest Payable
- Minus Ending Balance in Interest Payable
- Equals Interest Paid

Under the direct method, for this example, you would then report the following in the cash flows from the operating activities section of the cash flow statement:

- Cash Receipts from Customers
- Cash Payments for Inventory
- Cash Paid to Employees
- Cash Paid for Operating Expenses
- Taxes Paid
- Interest Paid
- Equals Net Cash provided by (used in) Operating Activities.

Similar types of calculations can be made of the balance sheet accounts to eliminate the effects of accrual accounting and determine the cash flows to be reported in the investing activities and financing activities sections of the cash flow statement.

Indirect Method

In preparing the cash flows from the operating activities section under the indirect method, you start with net income per the income statement, reverse out entries to income and expense accounts that do not involve a cash movement, and show the change in net working capital. Entries that affect net income but do not represent cash flows could include income you have earned but not yet received, amortisation of prepaid expenses, accrued expenses, and depreciation or amortisation. Under this method you are basically analysing your income and expense accounts, and working capital. The following is an example of how the indirect method would be presented on the cash flow statement:

1) Net Income per the Income Statement
2) Minus Entries to Income Accounts that do not represent Cash Flows
3) Plus Entries to Expense Accounts that do not represent Cash Flows
4) Equals Cash Flows before movements in Working Capital
5) Plus or minus the change in Working Capital, as follows:

    - An increase in current assets (excluding cash and cash equivalents) would be shown as a negative figure because cash was spent or converted into other current assets, thereby reducing the cash balance.

    - A decrease in current assets would be shown as a positive figure, because other current assets were converted into cash.

- An increase in current liabilities (excluding short-term debt which would be reported in the financing activities section) would be shown as a positive figure since more liabilities mean that less cash was spent.
- A decrease in current liabilities would be shown as a negative figure, because cash was spent in order to reduce liabilities.

The net effect of the above would then be reported as cash provided by (used in) the operating activities. The cash flows from investing activities and financing activities would be presented the same way as under the direct method.

Preparation of a cash flow statement through Direct Method is a straight forward exercise and left to the students to follow up. Here, we would take up the cash flow statement by indirect method for further examination through an illustration appended below:

We use the above approach and procedure in preparing a "profit–basis" cash flow statement in Illustration 6.3.

Illustration 2.3

The balance sheet of M/s. Gucci and Sammi Limited as at March 2003 and 2004 are given below:

M/s Gucci and Sammi

Balance Sheets as at	31st March, 2003 Rs.	31st March, 2004 Rs.
Assets:		
Cash Balances	50,000	60,000
Plant and Machineries	2,00,000	2,50,000
Less: Accumulated Depreciation	60,000	80,000
Land	1,00,000	80,000
Inventory	1,40,000	1,20,000
Trade Debtors	75,000	1,00,000
	5,05,000	5,30,000

Balance Sheets as at	31st March, 2003 Rs.	31st March, 2004 Rs.
Liabilities:		
Share Capital	2,00,000	2,40,000
Trade Creditors	30,000	40,000
Debtors	1,50,000	90,000
Retained Earnings	1,25,000	1,60,000
	5,05,000	5,30,000

Additional Information: Cash dividends of Rs.25,000 has been paid during the year. You are required to prepare cash flow statement following the indirect method.

Cash Flow Statement

	Rs.	31st March, 2004 Rs.
Cash Flow From Operating Activities:		
Net Profit before Taxation*	60,000	
Add: Depreciation	20,000	

Operating Profit before Working Capital Changes	80,000	
Net Increase in Debtors	(25,000)	
Net Decrease in Inventory	20,000	
Net Increase in Creditors	10,000	
Net Cash from Operating Activity (A)		85,000
Cash Flow From Investing Activities:		
Purchase of Plant and Machinery	(50,000)	
Proceeds from Sale of Land	20,000	
Net Cash Used in Investing Activities (B)		(30,000)
Cash Flow From Financing Activities:		
Issue of Share Capital	40,000	
Redemption of Debentures	(60,000)	
Dividends Paid	(25,000)	
Net Cash from Financing Activities (C)		(45,000)
Net increase in cash (A+B+C)		**10,000**
Cash Balance at the Beginning of the Period		**50,000**
Cash Balance at the End of the Period		**60,000**

Note: *Profit for the period = Increase in retained earnings + Dividends paid
= 35,000 + 25,000
= 60,000

☞ Check Your Progress 4

1) Mention the four major operating activities included in a cash flow statement.

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2.11 SUMMARY

In this unit we have tried to develop the idea of flow of funds within the organisation. Starting with the funds requirement for an organisation, we have tired to trace the sources and uses of funds.
We tried to study the important sources of funds, namely, the operations, sale of fixed assets, long-term borrowings and issue of new capital. Similarly, important uses of funds were traced to acquisition of fixed assets, payment of dividends, repayment of loans and capital. The whole exercise reveals the areas in which funds are deployed and the sources from which they are obtained. Finally, we have learned how to go about doing the funds flow analysis with the help of published accounting information.

We learnt, distinguishing between cash and fund as also cash flow statement and funds flow statement. The importance of cash and cash flow statement was dwelt upon. Our discussion centered around cash flow statement on “cash basis” and “profit basis”. We learnt how to go about doing the cash flow analysis with the help of

accounting information and finally presenting cash flows in the form of a "cash flow statement".

2.12 KEY WORDS

Cash Equivalents: These are highly liquid short term investments which could be readily converted to cash and which are subject to an insignificant risk of changes in value.

Cash Cycle represents the time during which cash is tied up in operations.

Funds from Operations: The change in working capital resulting from operations. Difference between inflow of funds in the form of revenue and outflow of funds in the form of expenses.

Sources of funds: The sources from which we obtain working capital for application elsewhere. Sources include operations, extraordinary profits, sale of fixed assets, new long-term borrowings, new issue of capital and the reduction of existing working capital.

Use of Funds: Also referred to as application of funds means use of additional working capital and includes amounts lost in operations (Operating loss), acquisition of fixed assets, working capital used for retiring long-term loans, payment of dividends and amounts utilised to increase working capital.

Working Capital: Current assets minus current liabilities.

2.13 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) What is working capital and what factors affect the size of working capital in an enterprise?

2) "Current assets to an extent are financed by current liabilities" Explain.

3) "Operations provide funds" Comment.

4) Differentiate between "Schedule of Changes in Working Capital" and "Fund Flow Statement.

5) Does a substantial balance in Retained Earnings indicate the presence of large cash balance?

6) "Net Profit of a business cannot pay dividend". Comment.

7) Explain the purposes of a cash flow statement.

8) What are the differences between a cash flow statement and funds flow statement?

9) X Ltd. has a sales revenue of Rs. 1,000. Depreciation for the period is Rs.200. Other operating expenses are Rs.900. **Net loss** for the period is Rs.100.
   a) What is the amount of funds generated from operations during the period by X Ltd.?
   b) Under what circumstances can the funds from operation be zero?

10) The following information and the balance sheet relate to Shyamsons Ltd.:

SHYAM SONS LTD
Balance Sheet as on 31st December

	Year 1	Year 2	Net change during the year Increase	Decrease
Assets	Rs.	Rs.	Rs.	Rs.
Cash	10,000	15,000	5,000	
Receivables	20,000	25,000	5,000	
Inventory	20,000	35,000	15,000	
Plant and Machinery Cost	85,000	85,000		
Less: Accumulated Depreciation	(15,000)	(10,000)		5,000
Total Assets	1,20,000	1,50,000		
Liabilities & Capital				
Sundry Creditors	8,000	10,000	2,000	
Outstanding Expenses	7,000	10,000	3,000	
Debentures Payable	10,000	5,000		5,000
Long-term Loans	5,000	25,000	20,000	
Capital	50,000	50,000		
Retained Earnings	40,000	50,000	10,000	
	1,20,000	1,50,000		

Net profit for the period after charging Rs.5,000 on account of depreciation was Rs. 20,000. A piece of equipment costing Rs.25,000 on which depreciation accumulated in the amount of Rs. 10,000 was sold for Rs. 10,000. Dividends paid during the year amounted to Rs. 10,000.

Prepare a Sources and Uses of funds statement in the following format:

SHYAMSONS LTD.
Sources and Uses of Funds

(in Rs.)

Uses of funds		**Sources of Funds**	
Purchase of Plant and Machinery		Operations: Net Income	
Repayment of Debentures		Add: Loss on Sale of Machinery	
Payment of Dividends			
Increase in Working Capital		Add: Depreciation	
		Sale of Equipment	
		Long-term Loan	
Total uses of Funds		Total Sources of Funds.	

11) The Balance Sheet of Bestwood Limited as at 31st March 2003 and 31st March 2004 are as follows:

	31st March 2003 Rs.	2004 Rs.		31st March 2003 Rs.	2004 Rs.
Issued Share Capital	60,000	80,000	Freehold property at Cost	50,000	50,000
Profit and Loss Account	54,000	46,000	Equipment (see note)	36,000	44,400
Corporation Tax Due:			Stock in Trade	32,800	35,600
			Debtors	27,200	28,000
31st March 2003	12,000	–	Bank	4,000	2,000
31st March 2004	–	8,000			

Creditors	24,000	26,000			
	1,50,000	1,60,000		1,50,000	1,60,000

Note: Equipment movements during the year ended 31st March 2004 were:

	Cost Rs.	**Depreciation Rs.**	**Net Rs.**
Balance at 31st March 2003	60,000	24,000	36,000
Additions during the year	18,000		
Depreciation provided during the year		7,600	
	78,000	31,600	
Disposal during year	8,000	6,000	
Balance at 31st March 2004	70,000	25,600	44,400

The company's summarised profit calculation for the year ended 31st March 2004 revealed:

	Rs	Rs
Sales		2,00,000
Gain on Sale of Equipment		800
		2,00,800
Less: Cost of Goods and Trading Expenses	1,73,200	
Depreciation	7,600	
		180,800
Net Profit		20,000
Corporation Tax on Profits of the year		8,000
Retained Profit of the year		12,000

During the year ended 31st March 2004 Bestwood Ltd. made a bonus issue of 1,000 ordinary shares of Rs. 10 each by capitalisation from the profit and loss account.

With the help of the above information , prepare a fund flow statement for Bestwood Ltd. revealing the sources and applications of funds during the year ended 31st March 2003.

Answers to self-assessment Questions/Exercises

1) Acquisition of new non-current assets (fixed assets)
2) Replacement of non-current debt (loans)
3) Payment of dividends
4) Increase in the balance of working capital (current assets–current liabilities)

10) (a) Funds generated from operations = Rs. 100
(b) When operating cash expenses are equal to operating incomes or revenues.

11)

SHYAM SONS LTD.
Sources and Use of Funds

Use of Funds	**Rs.**	**Sources of Funds**	**Rs.**	**Rs.**
Purchase of Plant and		Operations:		
Machinery	25,000	Net Income	20,000	
Repayment of Debentures	5,000	Add: Loss on sale of Machinery	5,000	
Payment of Dividends	10,000	Add Depreciation	5,000	

Increase in Net Working Capital	20,000		30,000
		Sale of Equipment	10,000
		Long-term Loan	20,000
Total uses of Funds	60,000	Total Sources of Funds	60,000

Working Capital Change

	Year 1	Year 2
Current Assets	50,000	75,000
Less: Current Liabilities	15,000	20,000
Working Capital	35,000	55,000
Increase in Working Capital		20,000

12) Decrease in working Capital Rs. 400
Funds from Sale of equipment Rs. 2,800.

2.14 FURTHER READINGS

1 *Understanding Financial Statements* Fraser Lyn. M and Aileen Ormiston, 04/10/2003, Prentice Hall: New Delhi (Chapter 4).

2. Financial Management , Pandey, I.M., 1999, Vikas Publishing House : New Delhi, Horngren, Charles T., Sundem Gary, L., 1994 (9th Ed.).

3. *Introduction to Management Accounting*, Prentice-Hall: Englewood-Cliffs of India Pvt. Ltd., New Delhi. (Chapter 14).

4 *Basic Accounting Practices*, Glantier, M. W. E., Underdown B. and A.C. Clark, 1979*,* Arnold Heineman: New Delhi: (Chapter 6, Section 6).

5 *Management Accounting*, Hingorani, N.L. and A.R. Ramanathan, 1986, Sultan Chand: New Delhi. (Chapter 8).

UNIT 3 RATIO ANALYSIS

Structure **Page Nos.**

3.0 INTRODUCTION

The stakeholders of a firm viz., shareholders, creditors, suppliers, managers, employees, tax authorities, government and others are interested broadly in knowing what the firm is doing and whether the firm is financially sound or otherwise. The information requirement of each of these stakeholders may be different. Trade creditors and short term lenders are interested knowing the ability of the firm to meet short term liabilities, whereas term lending institution and banks are interested in the long term survival of the firm. Similarly, others stakeholders may have other information requirements.

Before introducing you to the concept of financial analysis let us recaptulate on the various types of financial statements, as all the variables used in ratio analysis are taken from these statements.

1. **Profit & Loss A/C (P&L A/C)**: The income statement or trading and profit and loss account shows the various variables regarding expenses and revenue and the aggregate difference between these two as either net profit or net loss.

2. **Balance Sheet**: Balance sheet is a statement which shows the financial position of a firm on a particular date, it summarises the assets owned by the business and the claim of the owners and creditors against these assets in the form of liabilities as on the date of the statement.

3. **Profit & Loss Appropriation A/C**: This statement which is also known as profit and loss appropriation account is a link between P&L A/C and Balance sheet. The net profit shown in the P&L A/C is transferred to the balance sheet after appropriation though this statement. Retained earnings are the accumulated excess of earnings over losses and dividends.

4. **Fund Flow Statement**: This statement shows the sources of funds from which additional funds were derived and the use (application) of these funds.

5. **Cash Flow Statement:** This statement depicts the change in cash position from one period to another.

Financial statements are the means of providing general information regarding operational results and the financial position of a business firm. These statements do not reveal significant information such as efficiency of management strength and weakness of the firm, potential of further progress etc. In order to extract meaningful

information these statements need to be analysed and interpreted for specific purposes. Analysis of financial statements is the systematic numerical calculation of the relationship between one fact with the other to measure the profitability, operational efficiency and the growth potential of the business. The main objectives of financial statement analysis and interpretation are as follows:

- Measuring financial soundness
- Judging solvency
- Measuring profitability
- Judging operational efficiency
- Indicating trends
- Assessing growth potential
- Inter firm and intra firm comparison.

A ratio is an arithmetical relation between two figures or variables. Financial ratio analysis is a study of ratios between various items or group of items in financial statements. Financial ratio analysis is an analytical tool for measuring the performance of an organisation. Ratio analysis is primarily used to analyse past performance and based on this make future projections.

Users of Financial Ratios

Financial ratio analysis is the process of establishing relationship between the variables of the balance sheet and profit and loss account, in order to find out the strength and weakness of the firm. Ratio analysis is undertaken by the various stock holders in the firm viz. trade creditors, suppliers of long-term debt, investors and the management itself. Trade Creditors are interested in the firm's ability to meet claims in the short run. Their analysis will therefore, be confined to the firm's liquidity position in the short run.

Suppliers of long-term debt, on the other hand are more concerned with long-term solvency and survival. They analyse the firm's profitability over time, its ability to generate cash, its ability to repay interest and the principle amount. They also analyse the capital structure. Long-term suppliers of credit do analyse the historical financial statements but their main focus is on projected or proforma financial statement to analyse its future solvency and profitability. Investors are interested in the firm's earnings and how these earnings are used. They concentrate on the firm's present and future profitability. They are also interested in the firm's financial structure to the extent that it influences the firm's earnings ability and risk.

The management of the firm would be interested in every aspect of the financial ratio analysis as, this helps them assess how efficiently and effectively the firm's resources are being used.

Nature of Ratio Analysis

Ratios are used as a bench mark for evaluating the financial position and performance of a firm. Accounting figures presented in the financial statements would convey some meaning only if they are seen in relation to the other variables. Ratios help to other summarise large quantities of financial information (data). Through ratio analysis one can make a qualitative judgment. The ratios basically reflect a quantitative relationship among different variables.

Standards of Comparison

A ratio in itself would not provide any useful information, until and unless the ratios are compared with some standard. Standards of comparison may consist of:
Past ratios, i.e., ratios calculated from the past financial statements of the same firm. Competitor's ratios, i.e., ratios of some selected firms preferably the firms having similar turnover. Another approach is to compare the firm's ratios with that of the market leader. Industry ratios, i.e., the average ratios of the industry to which the firm belongs Projected ratios, i.e., ratios calculated using the projected or proforma financial statements of the same firm.

3.1 OBJECTIVES

After going through this unit, you should be able to:

- provide a broad classification of ratios;
- learn how to extract useful information from financial statement through ratio analysis;
- recognise the diagnostic role of financial ratios;
- highlight the utility of financial ratios in credit analysis and competitive analysis, and
- identify ratios which are appropriate for the control of activities.

3.2 CATEGORIES OF RATIOS

The ratios are broadly classified under categories as follows

- Solvency ratios
- Liquidity ratios
- Activity ratios
- Profitability ratios
- Market test ratios

3.2.1 Long-term Solvency Ratios

These ratios are primarily calculated to predict the ability of the firm to meet all its liabilities including those not currently payable. A set of ratios will give us information on the ability of the firm to meet all its financial obligation in future. Before proceeding further let us make a distinction between long term and short tem financial liabilities. Long-term financial liabilities are those financial liabilities which are to be met in the subsequent financial years whereas short-term liabilities are to be met in the current financial year itself. The ratios which are used to measure solvency are as follows:

- Debt Equity Ratio
- Shareholders Equity Ratio
- Debt to Net Worth Ratio
- Capital Gearing Ratio
- Fixed Asset to Long-Term Funds Ratio
- Proprietary Ratio
- Dividend Cover
- Interest Cover
- Debt Service Coverage Ratio

a) **Debt Equity Ratio**: There are basically two sources of capital – equity and debt. Debts are raised when owners want to increase investment but are

unwilling to dilute the equity or the cost of debt is less than that of equity. There are many ways to calculate this ratio but the most commonly used method is,

$$\text{Debt equity ratio} = \frac{Long\ term\ debt}{Share\ holder\ funds}$$

In other method instead of long term debts all the debts are taken into consideration. This ratio indicates the relationships between loan funds and net worth of the company which is known as **gearing**. It also depicts the relative contribution of owners and creditors. A company with a high components of debt capital relative to it's equity is known as a highly geared company and *vice-versa.* There is no standard debt equity ratio and the same will vary from industry to industry. For capital-intensive industries and industries having a high gestation period this ratio will be high.

b) **Shareholder's Equity Ratio:** This ratio is calculated as follows:

$$\frac{Shareholder\ equity}{Total\ assets\ (tangible)}$$

The financial strength of a firm can be gauged by the proportion of equity capital in it's capital structure, higher the proportion of equity, stronger is the firm's financial strength. This ratio depicts the relationship between the shareholders equity and the total assets. This ratio also indicates the degree to which unsecured creditors are protected against loss in the event of liquidation. Shareholders equity includes equity and preference capital plus reserves and surplus. An increase in this ratio implies that the dependence of the firm on outside sources of funds is decreasing.

c) **Debt to Net Worth Ratio**: This ratio is calculated as follows:

$$\frac{Long\ term\ debt}{Net\ worth}$$

This ratio computes long term debts of the firm to that of net worth. Net worth is calculated as capital and free reserves less fictitious assets like carry forward losses and deferred expenditure. This ratio is a refinement of the debt equity ratio and gives a factual idea of the adequacy of assets to meet long-term liabilities.

d) **Capital Gearing Ratio:** It is calculated as follows:

$$\frac{Fixed\ interest\ bearing\ funds}{Equity\ shareholder\ funds}$$

This ratio indicates the degree to which the firm is trading on equity which in turn indicates the volatility of earnings available to shareholders. The fixed interest bearing funds includes debentures, long-term loans and preference share capital. Equity shareholders funds include equity share capital, and reserves and surplus.

e) **Fixed Assets to Long-term Funds Ratio:** It is calculated as follows:

$$\frac{Fixed\ assets}{Long\ term\ funds}$$

This ratio indicates the proportion of long term funds (Share capital reserves and surplus and long term loans) deployed in fixed assets (gross fixed assets minus depreciation). A high ratio indicates the safety of funds in case of liquidation. This ratio also indicates the proportion of long-term funds invested in working capital.

f) **Proprietary Ratio:** It is calculated as follows:

$$\frac{Net\ worth}{Total\ assets}$$

Reserves which are created and earmarked for specific purposes should not be included in the calculation of net worth. A high ratio is an indication of a strong financial position.

g) **Interest Cover:** It is calculated as follows:

$$\frac{Profit\ before\ interest\ depreciation\ and\ tax}{Interest}$$

The interest coverage ratio reflects the number of times interest charges are covered by the funds that are available for payment of interest. Generally a ratio of 2:1 is considered as adequate.

h) **Dividend Cover:** It is calculated as follows:

$$\frac{Net\ profit\ after\ tax}{Dividend}$$

This ratio indicates the number of times the dividends are covered by net profit. This ratio also highlights the retained earnings.

i) **Debt Service Coverage Ratio:** It is calculated as follows:

$$\frac{Profit\ before\ interest\ and\ taxes}{Interest + perodic\ loan\ instalment}$$

This ratio reflects the ability of the firm to service its obligations on account of interest payment and loan repayments. A high ratio is an indicator of the fact that the firm is less likely to default on payments.

☞ Check Your Progress 1

1) From the following statement calculate: (1) Current Ratio, (ii) Liquidity Ratio, (iii) Debt-Equity Ratio, (iv) Proprietary Ratio and (v) Solvency Ratio.

Condensed Balance Sheet

Liabilities	Rs.	Assets	Rs.
Paid up Capital	1,00,000	Fixed Assets less Dep.	2,19,810
Reserves and Surplus	84,500	Stock	49,460
Debentures	1,00,000	Trade Debtors	11,710
Bills Payable	6,500	Cash at Bank	26,020
	3,07,000		3,0,000

2) Balance Sheet of S.K. Ltd. is given below:

	Rs.		Rs.
Equity Capital	50,000	Fixed Assets	1,40,000
12% Pref. Capital	30,000	Stock	20,000
15% Debentures	70,000	Debtors	16,000
Capital Reserve	5,000	Bank	14,000
P and L Account	10,000		
Creditors	12,000		
Bank Overdreaft	8,000		
Proposed Dividend	5,000		
	1,90,000		1,90,000

Calculate the Capital Gearing Ratio, Liquidity Ratio and Fixed Assets Ratio.

3) From the following information, calculate Interest Coverage Ratio, and Debt to Cash Flow Coverage Ratio:

Net Income After Tax	Rs. 15,630
Depreciation Charges	Rs. 20,000
Tax Rate	50% of net income
5% Mortage Bonds	Rs. 2,50,000
Fixed Interest Charges	Rs. 14,750
Sinking Fund Appropriations	5% of Outstanding Bonds

3.2.2 Liquidity Ratios (Short-term Solvency Ratios)

a) **Current Ratio:** It is calculated as follows:

$$\frac{Current\ assets\ loans\ and\ advances}{Current\ liabilities\ and\ provisions}$$

This ratio measures the solvency of the company in the short run (1 year). Current assets are those assets which can be converted into cash within one accounting period (usually 1 year) and current liabilities are those liabilities which are payable within a year. A current ratio of 1:33:1 is the minimum ratio required by banks to finance working capital needs. A very high current ratio implies that the firm has blocked the funds either in inventories, debtors or idle cash.

b) **Quick Ratio or Liquid Ratio:** It is calculated as follows:

$$\frac{Current\ assets, loans\ \&\ advaces - Inventories}{Current\ liabilities\ \&\ Provisions - Bank\ Overdraft}$$

This ratio is a modification of the current ratio. In this ratio inventories are subtracted from current assets and the bank overdraft is subtracted from, current liabilities. The reason for doing so is, that the bank overdraft is secured by inventories. This ratio depicts the ability of the firm to service current liabilities other than the bank overdraft.

c) **Absolute Liquid Ratio (Super Quick Ratio):** It is calculated as follows:

$$\frac{Absolute\ liquid\ Assets}{Current\ liabilities}$$

It is a ratio of absolute liquid assets to quick liabilities. However, for calculation purpose current liabilities are taken into consideration. Absolute liquid assets

are cash, bank balances and marketable securities. An ideal absolute liquid ratio is taken as 1:2 or .5.

d) **Bank Finance to Working Capital Gap Ratio:** It is calculated as follows:

$$\frac{Short\ term\ bank\ borrowings}{Working\ Capital\ gap}$$

This ratio shows the dependence on bank finance for working capital. Working capital gap is equal to current assets minus current liabilities other than bank borrowings.

e) **Interval Measures:** A dynamic measure of liquidity, the interval measure is defined as:

$$\frac{Quick\ assets}{Average\ daily\ expenses\ on\ operations}$$

Interval measure shows the time interval for which the liquid assets of the firm will suffice to meet its operating expenditure.

☞ Check Your Progress 2

1) Following is the Balance Sheet of Idiot Limited as on 31st March, 2004.

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	72,000	Plant and Machinery	1,35,000
Profit and Loss A/c.	18,000	Stock	36,000
Debentures	45,000	Sundry Debtors	27,000
Sundry Creditors	70,200	Cash at Bank	6,840
Provision for Taxation	1,800	Prepaid Expenses	2,160
	2,07,000		2,07,000

Calculate the following ratios:

1) Current Ratio,
2) Liquidity Ratio.

What conclusions do you draw about the company on the basis of these ratios?

3.2.3 Activity or Turnover Ratios

a) **Inventory:** For manufacturing and trading firms a considerable amount of funds may be tied up in financing of raw material, work in progress and finished goods. A good inventory management practice is to keep inventory level consistent with the need to fulfil customer's order in time.

$$\text{Inventory turnover ratio} = \frac{Cost\ of\ goods\ sold}{Average\ inventory} \text{ or}$$

$$= \frac{Sales}{Average\ Inventory}$$

Average inventory = $\frac{Opening\,Stock + Closing\,Stock}{2}$

Higher the inventory turnover ratio or lower the stock turnover period the better it is.

b) **Debtors:** The three main debtors ratio are as follows:

(i) Debtor turnover ratio: It is calculated as follows:

$$\frac{Credit\,Sales}{Average\,Debtors}$$

This ratio measures the efficiency of a firm in converting debtors into cash, higher ratios indicate better efficiency:

(ii) Average Collection period: It is calculated as follows:

$$\frac{Average\,debtors}{Credit\,sales} \times 365$$

This ratio measures the time it takes to collect the amount from debtors.

(iii) Bad debts: It is calculated as follows:

$$\frac{Bad\,debts}{Sales}$$

This ratio reflects the efficiency of credit control procedures.

c) **Creditors**

(i) Creditors payment period: It is calculated as follows:

$$\frac{Average\,creditors}{Purchase} \times 365$$

This ratio measures the average time taken to pay for goods and services purchased by the company. In general, longer the period better it is, because the operation of the firms are financed interest free by suppliers. An unduly long period would indicate liquidity problem on one hand and may also impact the credit rating of the firm.

(ii) Creditors turnover ratio: It is calculated as follows:

$$\frac{Credit\,purchase}{Average\,creditors}$$

d) **Assets Turnover Ratio:** These ratios measure the firms ability to generate sales revenue in relation to the size of the asset investment.

(i) Fixed assets turnover ratio:

$$\frac{Sales}{Fixed\,assets}$$

This ratio measures sales per rupee of investment. This ratio measures the efficiency with which fixed assets are being employed. When the fixed assets of the firm are old and substantially depreciated the fixed asset turnover ratio tends to the high.

(ii) Total assets turnover ratio: It is calculated as follows:

$$\frac{Sales}{Total\ assets}$$

This ratio measures how efficiently assets are employed overall.

(iii) Working capital turnover ratio: It is calculated as follows:

$$\frac{Sales}{Capital\ Employed}$$

This ratio indicates the extent of working capital turned over in achieving sales:

(iv) Sales to capital employed Ratio: It is calculated as follows:

$$\frac{Sales}{Capital\ employed}$$

This ratio indicates efficiency in utilisation of capital employed in generating revenue.

☞ Check Your Progress 3

1) Compute the stock turnover ratio with the help of following figures relating to Meenakshi Limited:

Trading Account
For the year ending 31 st March, 2004

	Rs.		Rs.
To Opening Stock	15,920	By Sales	78,000
To Purchases	39,000	By Closing Stock	14,400
To Carriage Inwards	1,000		
To Gross Profit	36,480		
	92,400		92,400

2) Raj & Co. sells goods on cash as well as on credit. The following particulars are extracted from the books of accounts for the year 2004:

	Rs.
Total Gross Sales	1,50,000
Sales Returns	30,000
Total Debtors for Sales as on 31.12.04	10,500
Bills Receivable as on 31.12.04	13,500
Provision for Doubtful Debts as on 31.12.04	3,000
Total Creditors on 31.12.04	1,000

Calculate the Average Collection period.

3) Tyagi and Sons Limited purchases goods on cash and credit terms. From the following particulars obtained from the books, calculate the creditors turnover and average payable period.

Rs.

Total Purchases	8,40,000
Cash Purchases	70,000
Purchases Returns	40,000
Creditors at the end of the year	1,20,000
Bills Payable at the end of the year	20,000
Provision for Discount on Creditors	7,500

4) The following is the Balance sheet of Sanchit Company Ltd. as on 31st 2004:

Liabilities	Rs.	Assets	Rs.
Share Capital	80,000	Fixed Assets	1,60,000
General Reserve	30,000	Debtors	60,000
Profit and Loss A/c	50,000	Bills Receivable	20,000
Mortgage Loan @ 10%	80,000	Cash at Bank	50,000
Creditors	40,000	Preliminary Expenses	10,000
Bills Payable	20,000		
Total	3,00,000		3,00,000

Other information:
Sales during the year 2003-04 amounted to Rs. 1,60,000.

Calculate:

(i) Capital Turnover Ratio
(ii) Fixed Assets Turnover Ratio
(iii) Working Capital Turnover Ratio
(iv) Current Assets Turnover Ratio
(v) Total Assets Turnover Ratio.

3.2.4 Profitability Ratios

The purpose of calculating these ratios is to assess the adequacy of the profits earned by the company and also to estimate the trend of profitability over a period of time. Profitability of a company is the net result of numerous policies and decision. These ratios show the combined effect of capital budgeting, liquidity management, asset management on operating results. Profitability, ratios are measured with reference to sales, capital employed, total assets, shareholders funds etc. The major profitability ratios are as follows:

a) Return on Capital Employed (ROCE) or Return on Investment (ROI)
b) Earning Per Share (EPS)
c) Cash Earning Per Share (cash EPS)
d) Gross Profit Margin
e) Net profit Margin
f) Cash Profit Ratio
g) Return on Assets
h) Return on Net Worth (or Return on Shareholders Equity)
i) Operating Ratios.

a) **Return on Investment:** The aim of any business enterprise is to earn a return on capital employed. ROI is determined by dividing the net profit or income by the capital employed or investment made to achieve the profit.

$$\text{ROI} = \frac{Net\ Profit}{Capital\ Employed} \times 100$$

ROI consists of two components (i) Profit Margins (ii) Investment Turnover.

$$ROI = \frac{Net\ profit}{Sales} \times \frac{Sales}{Investment\ in\ assets}$$

(Profit Margin) (Investment Turnover)

ROI can be improved by increasing the profit margin and investment turnover or both. The capital employed is found out by adding the debt and equity components of the balance sheet viz., Share Capital (paid up), Reserves and Surplus and Loans (secured and unsecured), from this total subtract if any, (i) Capital Work in Progress (ii) Investment Outside the Business Activities (iii) Preliminary Expenses (iv) Debit Balance of P&L A/C.

ROI is a measure regarding optimal utilisation of the assets of the company. This measures helps in selecting and disposing of assets as well as in selecting various investment proposals.

(b) **Earnings Per Share (EPS):** One of the objectives of the firm/company is wealth/value maximisation, of the stake of various stakeholders. The value is maximised when the market price of equity shares increases. The market price of equity shares is a function of the present and future earning potential of the firm. An appropriate and operationally feasible way to measure value maximisation is to measure Earning Per Share (EPS).The EPS is one of the important measures of economic performance of an economic entity. A higher EPS among the comparable firms means a better capital productivity.

$$EPS = \frac{Net\ profit\ after\ tax\ and\ preference\ dividend}{No.of\ equity\ shares}$$

1. EPS when debt and equity is used:

$$\frac{(EBIT - I)(I - T)}{N}$$

II. EPS when debt equity and preference shares are used:

$$\frac{(EBIT - I)(I - T) - D_p}{N}$$

Where EBIT = Earning before Interest and Taxes
I = Interest
T = Rate of Corporate Tax
Dp = Preference Dividend
N = Number of Equity Shares

c) **Cash Earning Per Share:** The cash earning per share is calculated by dividing the Net Profit + Depreciation by number of Equity Shares.

$$Cash\ EPS = \frac{Net\ Profit + Depreciation}{No.of\ Equity\ Shares}$$

d) **Gross Profit Margin:** The gross profit margin is calculated as follows:

$$= \frac{Sales - \cos t\ of\ goods\ sold}{sales} \times 100$$

or

$$= \frac{Gross\ profit}{Sales} \times 100$$

The gross profit measures, the excess of sales proceed over their cost before taking into consideration administration, selling, distribution and financing charges. This ratio measures, the efficiency of the company's operation. Under normal circumstances the gross profit margin should remain unchanged over a period of time irrespective of the level of production and sales, since it is based on the assumption that all cost deducted when computing gross profit are directly variable with sales. Variation in gross profit margin may be due to the following reasons:

1) price cuts
2) cost increases
3) change in product mix
4) under or over valuation of stocks.

e) **Net Profit Margin:** This profit is calculated as follows:

$$\frac{Net\ profit\ before\ interest\ and\ tax}{Sales} \times 100$$

This ratio reflects net profit margin on the total sales after deducting all expenses but before deducting the interest and corporate tax. The non-operating incomes and expenses are ignored in computation of net profit before tax, depreciation and interest. This ratio is used to compare performance with that of the previous year as well as with the competitors.

f) **Cash Profit Ratio:** This ratio is computed as follows:

$$\frac{\text{Cash profit}}{\text{Sales}} \times 100$$

where Cash profit= Net profit+Depreciation

This ratio measures the cash generated by the company as a result of the operations expressed in terms of sales. In situations where the profit fluctuates from year to year, due to changes in tax rates and depreciation rates and policies, this ratio is a reliable indicator of performance. This ratio is not affected by the method of depreciation used to charge depreciation.

g) **Return on Assets:** This ratio is calculated as follows:

$$\frac{Net\ profit\ after\ tax}{Total\ assets} \times 100$$

This ratio establishes the relationships of profits with the total assets of the organisation. This ratio indicates the efficiency of utilisation of assets in generating revenue.

h) **Return on Shareholders Funds or Return on Net Worth:**

$$\frac{Net\ profit\ after\ interest\ and\ tax}{Net\ worth} \times 100$$

Where Net Worth= Equity capital+reserves and surplus. This ratio expresses the net profit in terms of the equity shareholder funds.

i) **Operating Ratios**

The ratio of all operating expenses (i.e., materials used, labour, factory overheads, administration and selling expenses), to sales is the operating ratio over a period of time would reveal the behaviour of the particular cost. The operating ratios are classified as follows:

(a) **Material cost ratio** $= \frac{Materials\ consumed}{Sales} \times 100$

(b) **Labour cost ratio** $= \frac{Labour\ cost}{Sales} \times 100$

(c) **Factory overhead ratio** $= \frac{Factory\ expenses}{Sales} \times 100$

(d) **Administrative Expense Ratio** $= \frac{Administrative\ expenses}{Sales} \times 100$

(e) **Selling and distribution** $= \frac{\text{Selling and distribution experience}}{\text{Sales}} \times 100$

3.2.5 Market Test Ratios

The market test ratio relates the firm's stock price to its earning and book value per share. These ratios are indicators of the performance of the company and also reflects the likely performance of the company in the near future. If the firm's profitability, solvency and turnover ratios are good then the market test ratios will be high. The market test ratios are as follows:

a) Divided Payout Ratio
b) Dividend Yield
c) Book Value

a) **Dividend Payout Ratio:**

$$\frac{Dividend\ per\ share}{Earnings\ per\ shares}$$

Dividend payout ratio is the dividend per share divided by the earnings per share. Dividend payout ratio indicates the extent of the net profit distributed to the shareholders by way of dividend. A higher dividend payout ratio indicates that the company does not require further funds in the near future or it may also indicate that the cost of borrowing is less than the cost of equity. A low payout ratio is an indicator of the fact that company is in requirement of funds.

b) **Dividend Yield:**

$$\frac{Dividend\ per\ share}{Market\ price} \times 100$$

This ratio reflects the percentage yield earned by investors by investing in company's share at the current market price. This measures is specially useful for those investors who are interest in regular returns rather than capital appreciation.

c) **Book Value:**

$$\frac{\textit{Equity capital + Reserves – Profite Loss A/C debit balance}}{\textit{Total number of equity shares}}$$

This ratio indicates the net worth per equity share. Book Value is a function of the past earnings and distribution policy of the company.

☞ Check Your Progress 5

1) The capital of Sun Ltd. is as follows:

	Rs.
9% 30,000 Preference Shares of Rs. 10 each	3,00,000
80,000 Equity Shares of Rs. 10 each	8,00,000
	11,00,000

The following additional information has been obtained form the books of the company.

Profit after tax at 60% Rs. 2,0,000; Depreciation Rs. 60,000; Equity Dividend Paid 20% Market Price of Equity Share Rs. 40.

You are required to calculate (i) Dividend Yield on Equity Share; (ii) Earnings Per Share; (iii) Price Earning Ratio, and (iv) Dividend Pay-out Ratio.

3.3 UTILITY OF RATIO ANALYSIS

The ratio analysis is one of the most widely used tools of financial analysis. The various stakeholders in the firm would be interested in the information relating to operating and financial efficiency. They would also be interested in knowing the growth prospect of the firm. The various stake holders use ratio to determine those financial characteristics of the firm in which they are interested. With the help of ratios, one can determine:

- the ability of the firm to service its current obligations;
- the effect of borrowings on long term solvency;
- the efficiency with which the firm is utilising its assets in generating sales revenue; and
- the overall operating efficiency and performance of the firm.

Performance Analysis:

As stated above various stakeholders have different interests in the firm; short term creditors will be interested in the current financial position, while profitability long term creditors will be interested in the solvency of the firm. The equity holders are generally concerned with the returns. It is to be noted here that in every kind of financial analysis short-end long term financial position along with profitability are tested, but the emphasis would differ depending upon the interest of the stakeholder.

3.4 DIAGNOSTIC ROLE OF RATIOS

Profitability Analysis

1. How profitable is the company? What accounting policies and practices are followed by the company? Are they stable?
2. Is the profitability (RONA) of the company high/low average? What are the underlying reasons for current profitability? Is it due to:

    - Profit Margins
    - Asset Utilisation
    - Non Operating Income
    - Window Dressing
    - Changes in Accounting Policy
    - Inflationary Conditions?

3. Is the return on equity (ROE) high/low/average? Is it due to:

    - return on investment
    - financing mix
    - capitalisation of reserves?

4. What is the trend of profitability? Is it improving because of better utilisation of resources or curtailment of expenses of strategic importance?
5. Will the company be able to sustain high profitability or improve the profitability given the competitive and other environment utilisations.

Asset Utilisation

These types of ratios are basically used to gauge the effective utilisation of assets. Here assets include, both fixed as well as current assets. Through calculating these ratios we try to find out:

1. How effectively assets are being utilised to generate sales?
2. Are the level of debtors and inventories relative to sales reasonable in view of the firm's competitive and operating characteristics?
3. What are the trends in collection periods, inventory turnover and fixed assets turnover?
3. Is the improvement in the fixed assets turnover due to

    - depreciated book value of fixed assets?
    - disposal of some fixed assets.

Liquidity Analysis

As already discussed these ratios are used to predict short term and long-term solvency of the firm. In addition to this these ratios are also used to analyse the following:

1. What is the level of current assets and liabilities? Is it reasonable in the context of the firm's business?
2. What is the frequency and duration of payment to the creditors? If it is high or low what is the effect of it?
3. How efficiently and frequently does the company convert it's current assets into cash?
4. Given the company's riskiness and future financial needs, what is the pattern of financing :
   - What is the mix of debt and equity?
   - What is the maturity structure of debt and is the company faced with large debt repayment in the near future?
5. What are the lease commitments of the firms and the quantum of contingent liabilities?

3.5 APPLICATION OF FORMULAS

Example 3.1: The following is the Trading and Profit and Loss A/C and Balance Sheet of a firm:

Trading and Profit and Loss Account

Particular	Rs.	Particular	Rs.
To Opening Stock	10,000	By Sales	1,00,000
To Purchases	55,000	By Closing Stock	15,000
To Gross Profit c/d	50,000		
	1,15,000		1,15,000
		By Gross Profit b/d	50,000
To Administration Expenses	15,000		
To Interest	3,000		
To Selling Expenses	12,000		
To Net Profit	20,000		
	50,000		50,000

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Capital	1,00,000	Land and Buildings	50,000
Profit and Loss A/C	20,000	Plant and Machinery	30,000
Creditors	25,000	Stock	15,000
Bills Payable	15,000	Debtors	15,000
		Bills Receivable	12,500
		Cash at Bank	17,500
		Furniture	20,000
	1,60,000		1,60,000

Calculate the following ratios: (1) Inventory turnover ratio (2) Current ratio (3) Gross profit ratio (4) Net Profit (5) Operating ratio (6) Liquidity ratio (7) Proprietary ratio

Solution:

1. **Inventory Turnover Ratio** = $\frac{Cost\ of\ Goods\ Sold}{Average\ Stock}$

Cost of Goods Sold =

Opening Stock	10,000
Purchase	55,000
	65,000
Less: Closing Stock	15,000
	50,000

$$\frac{Opening\ Stock + ClosingStock}{2}$$

$$\frac{10,000+15,000}{2}=12,500$$

$$\text{Inventory Turnover Ratio} = \frac{50,000}{12,500} = 4 \text{ times.}$$

2. **Current Ratio:**

$$\text{Current Ratio} = \frac{Current\ Assets}{Current\ Liabilities}$$

Current Assets	Rs.	Current Liabilities	Rs.
Stock	15,000	Creditors	25,000
Debtors	15,000	Bills Payable	15,000
B/R	12,500		
Cash in Bank	17,500		40,000
	60,000		

$$\text{Current Ratio} = \frac{60,000}{40,000} = 1.5:1$$

3. **Gross Profit Ratio:**

$$\text{Gross Profit Ratio} = \frac{Gross\ Profit}{Net\ Sales} \times 100 = \frac{50,000}{1,00,000} \times 100 = 50\%$$

4. **Net Profit Ratio:**

$$\text{Net Profit Ratio} = \frac{Net\ Profit}{Net\ Sales} \times 100 = \frac{20,000}{1,00,000} \times 100 = 20\%$$

5. **Operating Profit:** $\frac{Cost\ of\ Goods\ sold + Operating\ expenses}{Net\ Sales} \times 100$

Cost of Goods Sold = 50,000

Operating Expenses (Rs.)

Administration Expenses	15,000
Selling Expenses	12,000
	27,000

$$\text{Operating Ratio } \frac{50,000 + 27,000}{1,00,000} \times 100 = 77\%$$

6. **Liquidity ratio =** $\dfrac{\textit{Liquid Assets}}{\textit{Current Liabilities}}$

Liquid Assets	Rs.	Current Liabilities	Rs.
Cash in Bank	17,500	Creditors	25,000
Bills Receivable	12,500	Bills Payable	15,000
Debtors	15,000		40,000
	45,000		

$$\text{Liquidity Ratio} = \frac{45,000}{40,000} = 1.125:1$$

7. **Proprietary Ratio**

$$\text{Proprietary Ratio} = \frac{\textit{Shareholder's funds}}{\textit{Total Assets}} \times 100$$

Capital	1,00,000
Profit and	20,000
Loss A/C	1,20,000

Total Assets = Rs. 1,60,000

$$\text{Proprietary ratio} = \frac{1,20,000}{1,60,000} \times 100 = 75\%$$

Example 3.2: There are three companies in the country manufacturing a particular chemical. Following data are available for the year 2003-04.

Company	Net Sales	Operating Cost	Operating Assets
A Ltd.	300	255	125
B Ltd.	1,500	1,200	750
C Ltd.	1,400	1,050	1,250

Which is the best performer as per your assessment and why?

Solution:

Comparative statement of performance (Rs. Lakhs)

Particular	A Ltd.	B Ltd.	C Ltd.
Sales	300	1500	1,400
Less: Operating Cost	255	1200	1,050
Operating Profit (A)	45	300	350
Operating Assets (B)	125	750	1,250
Return on Capital Employed (A)/(B)×100	36%	40%	28%

Analysis: Basing on the return on capital employed, B Ltd. is the best performer in comparison to A Ltd. and C Ltd.

Example 3.3: Calculate the P/E ratio from the following:

Equity Share Capital (Rs.20 each)	50,00,000
Reserve and surplus	5,00,000
Secured Loans at 15%	25,00,000
Insured Loans at 12.5%	10,00,000
Fixed Assets	30,00,000
Investments	5,00,000
Operating Profit	25,00,000

Income tax Rate 50%. Market Price/Share Rs.50.

Solution:

(Rs.)

Operating Profit		**25,00,000**
Less: Interest on		
Secured Loans @ 15%	3,75,000	
Unsecured Loans @ 12.5%	1,25,000	5,00,000
Profit Before Tax (PBT)		20,00,000
Less: Income-Tax @ 50%		10,00,000
Profit After Tax (PAT)		10,00,000

$$\text{Number of equity shares} = \frac{50,00,000}{20} = 2,50,000$$

$$\text{Earning as per share (EPS)} = \frac{Profit\ after\ tax}{No.of\ equity\ Shares} = \frac{Rs.10,00000}{Rs.2,50,000} = Rs.4$$

Price per share = Rs.50.
P/E ratio = Market price per share/EPS = Rs.50/Rs.4
= 12.50

Example 3.4: Profit and Loss Account of Happy Ltd.for the year ended 31st March 2004.

	Rs.		Rs.
To Opening stock	90,000	By Sales	9,00,000
To Purchases	5,60,000	By Closing Stock	90,000
To Wages	2,14,000		
To Gross Profit	1,26,000		9,90,000
	9,90,000		
To Salaries	16,000	By Gross Profit	1,26,000
To Electricity	10,000		
To Miscellaneous Expenses	10,000		
To Depreciation	30,000		
To Net profit	60,000		
	1,26,000		1,26,000

Balance Sheet of Happy Ltd. As on 31st March, 2004

Liabilities			Rs
			1,80,000
Equity Share Capital			1,20,000
Reserves and Surplus			2,10,000
Secured Loans			90,000
Creditors		Total:	6,00,000
Assets			
Fixed Assets	5,40,000		3,90,000
Less: Depreciation	1,50,000		
Stock			90,000
Debtors			1,05,000
Cash			15,000
			6,00,000

Discuss under the following important functional grouping the usual ratios and comment on the financial strength and weakness: (i) Liquidity and solvency ratios; and (ii) Profitability test ratios.

Solution:

I) Liquidity ratios

1. $$\text{Current Ratio} = \left[\frac{\textit{Current Assets}}{\textit{Current Liabilities}}\right] = \frac{2,10,000}{90,000} = 2.3$$

2. $$\text{Acid test Ratio} = \left[\frac{\textit{Liquid Assets}}{\textit{Current Liabilities}}\right] = \frac{1,20,000}{90,000} = 1.3$$

II) Solvency ratios

1. $$\text{Debt} - \text{Equity Ratio} = \left[\frac{\textit{Debt}}{\textit{Equity}}\right] = \frac{2,10,000}{3,00,000} = 0.7$$

2. $$\text{Fixed Assets Ratio} = \left[\frac{\textit{Fixed Assets}}{\textit{Long term funds}}\right] = \frac{3,90,000}{5,10,000} = 0.76$$

III) Profitability test ratios

1. $$\text{Gross Profit Ratio} = \left[\frac{\textit{Gross Profit}}{\textit{Sales}} \times 100\right] = \frac{1,26,000}{9,00,000} = 14\%$$

2. $$\text{Net Profit Ratio} = \left[\frac{\textit{Net Profit}}{\textit{sales}} \times 100\right] = \frac{60,000}{9,00,000} \times 100 = 6.7\%$$

$$\text{Return on Capital employed} = \left[\frac{\textit{Net Profit}}{\textit{Capital Employed}} \times 100\right] = \frac{60,000}{5,10,000} \times 100 = 11.7\%$$

Analysis

1. The current and acid test ratios are satisfactory. Since they are above the ideal standards of 2:1 and 1:1 respectively.

2. The debt equity ratio is marginally higher than the ideal standard of 2:1. However, the debt-equity ratio fixed assets ratios reflect a satisfactory position of the company.

3. The Gross Profit Ratio and Net Profit Ratio and Return on Capital Employed is not impressive and effort needs to be made to improve the profitability of the Company.

Example 3.5: The summarised Balance Sheet of M/s Ram Shyam. Traders Ltd. for the year 31.3.2005 is given below:

(Rs. in Lakh)

Capital and Liabilities		Assets		
Equity Share Capital (fully paid-up)	140	Fixed Asset (at cost)	210	
		Less: Depreciation	25	185
Reserves and Surplus	45	Current Assets:		
Profit and Loss Account	20	Stock	25	
Provision for Taxation	10	Debtors	30	70
Sundry Creditors	40	Cash	15	
Total:	255	Total:		255

The following further particulars are also given for the year:

(Rs. in lakhs)

Sales	120
Earnings before interest and tax (EBIT)	30
Net Profit After Tax (PAT)	20

Calculate the following for the company and explain the significance of each in one or two sentences:

(i) Current ratio; (ii) Liquidity ratio; (iii) Profitability ratio; (iv) Profitability on funds employed; (v) Debtors' turnover; (vi) Stock turnover; (vii) Average collection period; (viii) Return on equity.

Solution:

(i) Current Ratio

(Rs. Lakhs)

Current Assets	
Stock	25
Debtors	30
Cash	15
Total	70
Current Liabilities	40

$$= \left[\frac{Current\ Assets}{Current\ Liabilities} \right] = \left[\frac{70}{40} \right] = 1.75 : 1$$

This ratio indicates the financial position of firm in meeting current liabilities out of current assets. The prudential norm is 2:1.

(ii)

$$\text{Liquidity Ratio} = \left[\frac{quick\ assets}{Current\ liabilities}\right] = \left[\frac{Current\ assets - Stock}{Current\ liabilities}\right] = \left[\frac{70-25}{40}\right] = 1.125:1$$

Liquidity ratio indicates the liquidity position of the company in meeting its current liabilities out of the liquid assets. The prudential norm is 1:1

(iii)

$$\text{Profitablitiy Ratio} = \left[\frac{EBIT}{Sales} \times 100\right] = \frac{30}{120} \times 100 = 25\%$$

This ratio indicates the margin of profit made on sales.

(iv) Profitability on funds employed:

$$= \left[\frac{EBIT}{Share\ capital\ and\ longterm\ loan} \times 100\right] = \frac{30}{205} \times 100 = 14.64\%$$

This ratio indicates the margin of profit made on sales.

(v) $$\text{Debtor's turnover} = \left[\frac{Sales}{Average\ Debtors}\right]\frac{120}{30} = 4 \text{ times}$$

It indicates the speed in conversion of debtors into cash.

(vi) Stock turnover = $$\left[\frac{Sales}{Average\ Stock}\right] = \frac{120}{25} = 4.8 \text{ times}$$

It indicates the number of times the stock is converted into sales.

(vii) $$\text{Average collection period} = \left[\frac{Average\ Debtors}{Credit\ sales} \times 12\right] = \frac{30}{120} \times 12 = 3\ months$$

This ratio indicates the average credit period allowed to the customers.

(viii) $$\text{Return on equity} = \left[\frac{PAT}{Shareholder's\ funds} \times 100\right] = \frac{20}{205} \times 100 = 9.76\%.$$

This ratio indicates the percentage profit after tax earned on shareholders funds.

Example 3.6: The Profit and loss Account and Balance Sheet of XYZ Ltd. are as under:

Profit and Loss Account for the year ended 31st December, 2004.

Net Sales		3,00,000
Less: Cost of Production		2,58,000
		42,000
Less: Operating Expenses:		
Selling	2,200	
General Administration	4,000	
Rent of Office	2,800	9,000
Gross Operating Profit		33,000
Less: Depreciation		10,000
		23,000
Net-Operating Profit		1,500
Other Income (Interest on Government Securities)		
Gross Income (before tax)		24,500
Less: Other Expenses:		
Interest on Bank Overdraft	300	
Interest on Debentures	4,200	4,500
Net Income (before Tax)		20,000
Tax 50% on net income		10,000
Net Income (after Tax)		10,000

Balance Sheet as at 31st December, 2004

(Rs.)

Liabilities		
Equity Share Capital		50,000
7% Preference Share Capital		10,000
Reserves and Surplus		40,000
6% Mortgage Debentures		70,000
Creditors		6,000
Bills Payable		10,000
Outstanding Expenses		1,000
Provision for Taxation		13,000
		2,00,000
Assets		
Fixed Assets	1,80,000	1,30,000
Less: Depreciation	50,000	
		15,000
Investment in Government securities		
Debtors		20,000
Stock		30,000
Cash		5,000
		2,00,000

You are required to calculate the following ratios: (i) Return on Investment; (ii) Net Profit Ratio; (iii) Current Ratio; (iv) Net Worth to Capital Employed; (v) Cost of Production to Capital Employed.

Solution:

(i) Return on Investment

$$\frac{Net\ Operating\ Profit \times 100}{Capital\ employed} = \frac{Rs.22,700 \times 100}{Rs.1,55,000} = 14.65\%$$

Operating Profit = Net profit before non-operating income but after Interest on bank overdrafts

Capital employed = Net fixed assets+Current assets-Current liabilities

Alternatively,

Return on Investment =

$$\frac{Net\ Profit\ (before\ interest\ and\ tax) \times 100}{Capital\ employed} = \frac{Rs.24,200 \times 100}{Rs.1,70,000} = 14.24\%$$

Tax and profit includes income from interest on Government Securities (less interest on bank overdrafts) and capital employed covers investment n government securities also.

(ii) **Net Profit Ratio:**

$$\frac{Net\ Profit\ (after\ tax) \times 100}{Net\ Sales} = \frac{\text{Rs.}10,000 \times 100}{\text{Rs.}3,00,000} = 3.33\%$$

$$Alternatively, \frac{Net\ Operating\ Profit \times 100}{Net\ Sales} = \frac{\text{Rs.}23,000 \times 100}{\text{Rs.}3,00,000} = 7.67\%$$

(iii) **Current Ratio:**

$$\frac{Current\ Assets}{Current\ Liabilities} = \frac{\text{Rs.}55,000}{\text{Rs.}30,000} = 1.83:1$$

$$\text{or} = \frac{\text{Rs.}70,000}{30,000} = 2.33:1$$

(Current Assets inclusive of Investment in Government Securities)

(iv) **Net Worth to Capital employed:**

$$\frac{Net\ Worth}{Capital\ Employed} = \frac{\text{Rs.}1,00,000}{\text{Rs.}1,70,000} = 58.32\%$$

$$\text{or} = \frac{\text{Rs.}1,00,000 \times 100}{\text{Rs.}1,55,000} = 64.52\%$$

(v) **Cost of Production to Capital Employed**

$$= \frac{Current\ of\ Production \times 100}{Capital\ Employed} = \frac{\text{Rs.}2,58,000 \times 100}{\text{Rs.}1,70,000} = 151.76\%$$

$$\text{or} = \frac{\text{Rs.}2,58,000 \times 100}{\text{Rs.}1,55,000} = 166.45\%$$

Example 3.7: From the Final Accounts of Product Ltd. Given below, calculate the following:

(i) Gross profit ratio (ii) Current ratio, (iii) Liquid ratio; and (iv) Return on investment ratio.

Trading and Profit and Loss Account for the year ended 31st March, 2004

		Rs.		Rs.
To Material Consumed			By Sales	85,000
Opening Stock	9,050		By Profit	600
Purchase	54,525		By Interest on Investment	300
	63,575			
Less: Closing stock	14,000			
		49,575		
To Carriage Inwards		1,425		
To Office Expenses		15,000		
To Sales Expenses		3,000		
To Financial Expenses		1,500		
To Loss on Sales of Tired Assets		400		
To Net Profit		15,000		
		85,900		85,900

Balance Sheet as on 31st March, 2004

Liabilities		Rs.	Assets		Rs.
Share Capital 2,000 Equity Shares of Rs. 10 each, fully paid		20,000	Fixed Assets:		
			Buildings	15,000	
General Reserve		9,000	Plant	8,000	23,000
Profit and Loss Account		6,000	Current Assets:		
Bank Overdraft		3,000	Stock-in-trade	14,000	
Sundry Creditors			Debtors	7,000	
			Bills Receivable	1,000	25,000
For Expenses	2,000		Bank Balance	3,000	48,000
For Others	8,000	10,000			
		48,000			

Solution:

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

		Rs.
Sales		85,000
Less: Material Consumption	49,575	
Carriage Inwards	1,425	51,000
		34,000

$$\text{Gross Profit Ratio} = \frac{\text{Rs.}34,000}{\text{Rs.}85,000} \times 100 = 40\%$$

Stock	14,000
Debtors	7,000
Bills Receivable	1,000
Bank	3,000
Current Assets	25,000

$$\text{Current Ratio} = \frac{\textit{Current Assets}}{\textit{Current Liabilities}}$$

	Rs.
Sundry Creditors	10,000
Bank Overdraft	3,000
Current Liabilities	13,000

$$\text{Current Ratio} = \frac{\text{Rs.}25{,}000}{\text{Rs.}13{,}000} = 1.92:1$$

Calculation of Liquid Ratio

Liquid ratio =

$$\frac{\text{Liquid Assets}}{\text{Current Liabilities}} = \frac{\textit{Current Assets} - \textit{Stock}}{\textit{Current Liabilities}} = \frac{\text{Rs.}25{,}000 - \text{Rs.}14{,}000}{\text{Rs.}13{,}000} = 0.84:1$$

$$\text{Return on investment} = \frac{\textit{Operating Profit}}{\textit{Capital Employed}} \times 100$$

		Rs.
Net Profit		15,000
Add: Loss on Sale of Fixed Assets		400
Financial Charges		1,500
		16,900
Less: Interest on Investment	300	
Profit (non-operating)	600	
Operating Profit		900
		16,000

	Rs.
Share Capital	20,000
General Reserve	9,000
Profit & Loss A/c	6,000
Capital Employed	35,000

$$\text{Return on investment} = \frac{\text{Rs.}16{,}000}{\text{Rs.}35{,}000} \times 100 = 45.71\%$$

Example 3.8: The following data has been extracted from the annual accounts of a company:

	(Rs. in lakhs)
Share Capital Divided into 20,00,000 Equity Shares of Rs. 10 each	200.00
General Reserve	150.00
Investment Allowance Reserve	50.00
15% Long Term Loan	300.00
Profit Before Tax	140.00
Provision for Taxation	84.00
Proposed Dividends	10.00

From the details given above calculate the following: (i) Return on capital employed; (ii) Return on net worth.

Solution:

(a) Calculation of Capital Employed

Share Capital	200
General Reserve	150
Investment Allowance Reserve	50
15% Long Term Loan	300
Capital Employed	700

(b) Calculation of Return

Profit before Tax	140
Add: 15% Interest on Long Term Loan	45
Return	185

(c) Calculation of Net Worth

Share Capital	200
General Reserve	150
Investment Allowance	50
Reserve	400

(d) Return on Shareholders' Fund

Profit before Taxation	140
Less: Provision for Taxation	84
Return	56

On the basis of the above the following ratios have been calculated:

(i) Return on Capital Employed =

$$\frac{Return}{Capital\ Employed} \times 100 = \frac{185 \times 100}{700} = 26.4\%$$

(ii) Return on net worth =

$$\frac{Return\ on\ shareholders\ funds}{Net\ worth} \times 100 = \frac{56 \times 100}{400} = 14\%$$

Example 3.9: From the following final accounts of XYZ Ltd. For the year ended 31st March 2004, you are required to calculate the following: (i) Acid test ratio; (ii) Stock Turnover ratio; (iii) Operating Ratio;

Balance sheet as on 31st March 2004

Liabilities	Rs.	Assets	Rs.
Share Capital (in shares of Rs. 10 each	5,00,000	Land and Buildings	5,00,000
		Plant and Machinery	2,00,000
General Reserve	4,00,000	Stock	1,50,000
Profit and Loss A/c	1,50,000	Sundry Debtors	2,50,000
Sundry Creditors	2,00,000	Cash and Bank Balance	1,50,000
	12,50,000		12,50,000

Profit and Loss account for the year ended 31st March, 2004

Opening Stock	2,50,000		
Purchases	10,50,000	Sales	18,00000
Gross Profit c/d	6,50,000	Closing Stock	1,50,000
	19,50,000		19,50,000
Admn. Expenses	2,30,000		6,50,000
Selling and Distribution Expenses	1,00,000		50,000
		Gross Profit b/d	7,00,000
Expenses of Financing	20,000	Other Income (misc.)	
	3,50,000		
Net Profit	7,00,000		

Solution:

Working Notes:

(i) Cost of Goods Sold = (Opening Stock + Purchases – Closing Stock)

= Rs. 2,50,000+10,50,000 – Rs. 1,50,000 = Rs. 11,50,000

or

= Sales-Gross profit = Rs. 18,00,000-Rs 6,50,000 = Rs.11,50,000

(ii) Operating Expenses = Administrative Exp. + Selling and Distribution Exp.

= Rs. 2,30,000+Rs. 1,00,000 = 2,30,000

(iii) Statement of Capital Employed

Share Capital	5,00,000
General Reserve	4,00,000
Profit and Loss A/c	1,50,000
Shareholders' Funds	10,50,000

(iv) Average Stock =

$$\frac{Opening\ Stock + Closing\ Stock}{2} = \frac{\text{Rs.}2{,}50{,}000 + \text{Rs.}1{,}50{,}000}{2} = \text{Rs.}2{,}00{,}000$$

Calculation of Ratios

(i) Acid Test Ratio = $\frac{Liquid\ Assets}{Current\ Liabilities} = \frac{Rs.4{,}00{,}000}{Rs.2{,}00{,}000} = 2:1$

(ii) Stock Turnover Ratio =

$$\frac{Cost\ of\ Goods\ Sold}{Average\ Stock\ at\ Cost} = \frac{Rs.11{,}50{,}000}{Rs.2{,}00{,}000} = 5.75\ times$$

(iv) Operating Ratios = $\frac{Cost\ of\ Goods\ Sold + Operating\ Express \times 100}{Net\ Sales}$

$$\frac{(Rs.11,50,000 + Rs.3,30,000) \times 100}{Rs.18,00,000}$$

Fixed Assets to Net Worth Ratio $= \frac{1,40,000}{90,000} = 1.55:1$

Example 3.10: From the following data: (a) Current ratio (b) Quick ratio (c) Stock Turnover ratio (d) Operating ratio (e) Rate of return on equity capital.

Balance Sheet as on December 31, 2004

Liabilities	Rs.	Assets	Rs.
Equity Share Capital (Rs. 10 shares)	10,00,000	Plant and Machinery	6,40,000
		Land and Buildings	80,000
Profit and Loss Account	3,68,000	Cash	1,60,000
Creditors	1,04,000	Debtors	
Bills Payable	2,00,000	Less: Provision for Bad Debts	3,20,000
			4,80,000
Other Current Liabilities	20,000	Stock Prepaid Insurance	12,000
	16,92,000		16,92,000

Income Statement for the year ending 31st December 2004

(Rs.)

Sales	40,00,000
Less: Cost of good	30,80,000
	9,20,000
Less: Operating expenses	6,80,000
Net Profit	2,40,000
Less: Income tax paid 50%	1,20,000
Net profit after tax	1,20,000

Solution:

Balance at the beginning of the year:

Debtors Rs. 3,00,000
Stock Rs. 4,00,000

(a) Current Ratio $\frac{Current\ Assets}{Current\ Liabilities}$

Current Assets	Rs.	Current Liabilities	Rs.
Cash	1,60,000	Creditors	1,04,000
Debtors	3,20,000	Bills Payable	2,00,000
Stock	4,80,000	Other Current	20,000
Prepaid	12,000	Liabilities	3,24,000
Insurance	9,72,000		

Current Ratio = $\frac{9,72,000}{3,24,000} = 3:1$

(b) Quick Ratio

Quick Ratio = $\frac{Liquid\ Assets}{Current\ Liabilities}$

Liquid assets

	Rs.
Cash	1,60,000
Debtors	3,20,000
	4,80,000

Liquid Ratio = $\frac{4,80,000}{3,24,000} = 1.48:1$

(c) Stock Turnover Ratio = $\frac{Cost\ of\ goods\ sold}{Average\ stock}$

cost of good sold = 30,80,000

Average stock =

$$\frac{Opening\ Stock + Closing\ Stock}{2} = \frac{4,00,000 + 4,80,000}{2} = 4,40,000$$

Stock Turnover ratio = $\frac{30,80,000}{4,40,000} = 7\ times$

(d) Operating ratio =

$$\frac{Cost\ of\ goods\ sold + Operating\ expenses}{Net\ Sales} \times 100 = \frac{30,80,000 + 6,80,000}{40,00,000} \times 100 = 94\%$$

(e) Rate of Return on equity capital

$$\frac{Net\ Profit\ after\ Tax}{Equity\ Share\ Capital} \times 100 = \frac{1,20,000}{10,00,000} \times 100 = 12\%$$

Example 3.11 The capital of Growfast Co. Ltd. is as follows:

Preference shares of Rs.10 each	50,00,000
Equity share Rs. 100 each	70,00,000
	1,20,00,000

Additional Information:

Profit after tax at 50%	Rs. 15,00,000	Equity dividend paid	10%
Depreciation	Rs. 6,00,000	Market price per equity share	Rs.200

Calculation the following: (i) The cover for the preference and equity dividends; (ii) The earnings per share; (iii) The price earnings ratio; (iv) The net funds flow.

Solution:

(1) Cover for the Preference and Equity dividends

$$\frac{Profit\ after\ tax}{Preference\ dividend + Equity\ dividend} = \frac{Rs.15,00,000}{Rs.5,00,000 + Rs.7,00,000} = 1.25\ Times$$

(ii) Earning Per Share

$$\frac{\textit{Net Profit after Preference dividend}}{\textit{Number of equity shares}} = \frac{\text{Rs.15,00,000} - \text{Rs.5,00,000}}{70{,}000} = \text{Rs.14.29}$$

(iii) Price Earnings Ratio

$$\frac{\textit{Market Price per share}}{\textit{Earning per share}} = \frac{\text{Rs.200}}{\text{Rs.14.29}} = 14\,\text{Times}$$

(iv) The net funds flow:

Profit after tax 15,00,000
Add: Depreciation
6,00,000
15,00,000+6,00,000
21,00,000

3.6 SUMMARY

A large number of ratios are used to measure performance and exercise control. The ratios are used by all the stakeholders of the business viz., owners, managers, creditors, bankers, suppliers, government etc. The ratios are basically divided into five categories. The short and long term solvency ratios are used to judge the ability of the firm to meet it's financial obligations. Activity or turnover ratios are used to find out how effectively and efficiently the firm's resources are being used. Profitability ratios are used to gauge the profitability of the firm with reference to sales and assets. The market test ratios are used to gauge the firm performance in terms of share prices and dividends.

Liquidity Ratios:

Current Ratio	$\frac{\textit{Current Assets}}{\textit{Current Liabilities}}$
Quick Ratio	$\frac{\textit{Current Assets} - \textit{Inventory}}{\textit{Current Liabilities}}$
Interval measure	$\frac{\textit{Current Assets} - \textit{Inventory}}{\textit{Average daily cash operating expenses}}$

Leverage Ratios:

Total debt ratio	$\frac{\textit{Total debt}}{\textit{Capital employed}}$
Debt-equity ratio	$\frac{\textit{Net worth}}{\textit{Total debt}}$
Capital-equity ratio	$\frac{\textit{Capital employed or net assets}}{\textit{Net Worth}}$
Interest Coverage	$\frac{\textit{EBIDTA}}{\textit{Interest}}$

Activity Ratios:

Inventory turnover	$\frac{Cost\ of\ goods\ sold\ or\ sales}{Inventory}$
No. of days, inventory	$\frac{360}{Inventory\ turnover}$
Debtors turnover	$\frac{Credits\ sales\ or\ Sales}{Debtors}$
Collection period	$\frac{360}{Debtors\ turnover}$
Assets turnover	$\frac{Sales}{Net\ assets\ or\ capital\ employd}$
Working capital turnover	$\frac{Sales}{Net\ working\ capital}$

Profitability Ratios:

Gross margin	$\frac{Gross\ profit}{Sales}\ or\ \frac{EBIT}{Sales}$
Net margin	$\frac{Profit\ after\ tax}{Sales}\ or\ \frac{EBIT\ (1-\ )}{Sales}$
PAT to EBIT ratio	$\frac{PAT}{EBIT}$
Return on Investment (ROI) before tax	$\frac{EBIT}{Net\ assets\ or\ capital\ employed}$
Return on Investment (ROI) after tax	$\frac{EBIT\ (1-Tax\ rate)}{Net\ assets\ or\ capital\ employd}$
Return on Investment (ROI) before tax	$\frac{EBIDTA}{Total\ assets\ or\ Net\ assets}$
Return on equity (ROE)	$\frac{Profit\ after\ tax}{Net\ worth}$

There exists a relationship between various ratios. For example, ROE can be expressed as follows:

ROE	$\frac{\text{Sales}}{\text{Net assets}} \times \frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{PAT}}{\text{EBIT}} \times \frac{\text{Net assets}}{\text{Net Worth}}$

In practice companies calculate many other ratios. Most important ratios include:

EPS	$\frac{\text{PAT}}{\text{No. of shares}}$
DPS	$\frac{\text{Profit distributed}}{\text{No. of shares}}$
Payout	$\frac{\text{DPS}}{\text{EPS}}$
Price-earnings ratio	$\frac{\text{Market value of share}}{\text{EPS}}$
Market value-book value ratio	$\frac{\text{Market value of share}}{\text{Book value of share}}$

3.7 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) What are the different types of financial ratios?

2) Discuss the importance of liquidity ratios?

3) Define and evaluate various leverage ratios?

4) Discuss the important turnover ratios.

5) Explain the important profit margin ratios?

6) Compare the following: rate of return ratios, return on total assets ratios, and returns on equity?

7) Discuss key valuation ratios?

8) If the market price per share is equal to the book value per share, the following are equal, return on equity, price earning ratio, and total yield. Prove.

9) Write short notes on 'Debt Service Coverage Ratio'.

10) Explain proprietary ratio.

11) 'Ratios are indicators – sometimes pointers but not in themselves powerful tools of management'. Explain.

12) Ratio analysis is only a technique for making judgments and not a substitute for judgments. Examine.

13) Write short notes on (i) Return on investments
(ii) Pay-out Ratio.

14) Explain the limitations of ratio analysis for evaluating investment proposals and liquidity analysis.

15) Ratios are symptoms like blood pressures, the, pulse or the temperature of an individual'. Explain, also name and explain in brief the ratios made use to judge the long-term solvency of a concern.

16) Write short notes on 'Earnings per share'.

17) Distinguish between Operating Ratios and Turnover Ratio.

18) Ratio analysis is an important tool for judgement of the health of any organisation. Elaborate.

19) Write notes on uses and limitations of 'Ratio Analysis'.

PROBLEMS

1) Premier Company's net margin is 5 per cent. The total return assets turnover ratio is 1.5 times, debt to total assets ratios is 0.7. What is the return on equity for premier?

2) McGill Inc. has a profit before tax of Rs.40 ml. If the company's times interest covered ratio is 6? What is the total interest charge?

3) The following data applies to a firm.

Interest Charges	Rs. 150,000
Sales	Rs. 7,000,000
Tax Rate	60 per cent
Net Profit Margin	6 per cent

What is the firm's times covered ratio?

4) A firm's current assets and current liabilities are 600 and 1,500 respectively. How much can it borrow from a bank without reducing the current ratio given below 1.5? Justify.

5) A firm has a total annual sales of 1,000,000 and accounts receivable is collected if management want to reducing the accounts receivable to 120,0000?

6) Determine the sales of a firm with the following financial data:

Current Ratio	1.5
Acid-test Ratio	1.2
Current Liabilities	800,000
Inventory Turn Over Ratio	times

7) Complete the balance sheet and sales data (fill in the blanks) using the following financial data:

Debt/Equity Ratio	0.60
Acid-Test Ratio	12
Total Assets Turnover Ratio	15
Day's Sales Outstanding in Account Receivable	40 days
Gross Profit Margin	20 per cent
Inventory Turnover	5

Balance sheet

Equity Capital	50,000	Plant and Equipment
Retained Earning	60,000	Inventories
		Account Receivable Cash

8) The 19X0-balance sheet and income statement for Omex limited is given below. Compute the financial ratios for Omex. Evaluate Omex performance with reference to the standards.

Omex limited balance sheet 31 December 2005

Liabilities and Equity

	Rs.
Equity Capital	10,000, 000
Reserves and Surplus	22,500,000
Long Term Debt	12,500,000
Short Term Bank Borrowing	15,000,000
Trade Creditors	10,000,000
Provision	5,000,000
Total	**75,000,000**

	Rs.
Assets Fixed Assets (net)	30, 000,000
Current Assets	
Cash in bank	5,000,000
Receivable	15,000,000
Inventories	20,000,000
Pre Paid Expenses	2,500,000
Other	2,500,000
Total	**75,000,000**

Omex limited income statement for the year Ended.
December 31, 2005

	Rs.
Net Sales	95,000,000
Cost of Goods Sold	72,000,000
Gross Profit	23,000,000
Operating Expenses	10,000,000
Operating Profit	12,500,000
Non- Operating Surplus	2,600,000
Profit Before Interest and Tax	15,100,000
Interest	5,000,000
Profit before Tax	10,100,000
Tax	5,000,000
Profit After Tax	5,100,000
Dividends	1,600,000
Retained Earnings	3,300,000

Omex	**Standard**
Current Ratio	1.5
Acid-test Ratio	0.80
Debt-Equity Ratio	1.5
Times Interested Covered Ratio	3.5
Inventory Turnover Ratio	4.0
Average Collection Period	60 days
Total Assets Turnover Ratio	1.0
Net Profit Margin Ratio	6%
Earning Power	10%
Return on Equity	12%

3.8 SOLUTIONS/ANSWERS

Check Your Progress 1

1)

i) Current Ratio = $\frac{Current\ Assets}{Current\ Liabilities}$

$= \frac{Rs.87,190}{Rs.22,500} = 3.88:1$

Current Assets = Cash at Bank + Trade Debtors +Stock

= Rs. 26,020 + Rs. 11,710 + Rs. 49,460

= Rs. 87,190

Current Liabilities = Creditors + Bills Payable

= Rs. 16,000 + Rs. 6,500 = Rs. 22, 500

ii) Liquidity Ratio = $\frac{Current\ Assets}{Current\ Liabilities}$

$= \frac{Rs.37,730\,(Rs.26,020+11,710)}{Rs.22,500} = 1.68:1$

iii) Debt-Equity Ratio = $\frac{Total\ Debts}{Shareholders'\ Funds}$

$\frac{Rs.1,22,500}{Rs.1,84,500} = 0.66:1$

Total Debts = Debentures +Current Liabilities

= Rs. 1,00,000+Rs. 22,500 = Rs. 1,22,500

Shareholders' Funds = Rs. 1,00,000+Rs. 84,500 = Rs. 1,84,500

(iv) Proprietary Ratio = $\frac{Proprietory\ Funds}{Total\ Assets}$

$\frac{Rs.1,84,500}{Rs.13,07,000} = 0.6:1$

(v) Solvency Ratio = $\frac{Total\ Debts}{Total\ Assets}$

$= \frac{Rs.1,22,500}{Rs.3,07,000} = 0.4:1$

2) i) Capital Gearing Ratio = $\frac{Variable\,Cost\,bearing\ Capital}{Fixed\ Cost\,bearing\ Capital}$

$= \frac{Rs.65,000}{Rs.1,00,000} = 65:1$ It is High Gearing

Variable Cost Bearing Capital

= Equity Capital + Capital Reserve + P. & L. A/c.

= Rs. 50,000 + Rs. 10, 000 + Rs. 5,000 = Rs. 65,000

Fixed Cost Bearing Capital

= 2% Pref. Capital + 15% Debentures

= Rs. 30,000 + Rs. 70,000 = Rs. 1,00,000

ii) Liquidity Ratio = $\frac{Liquid\ Assets}{Current\ Liabilities}$

$= \frac{Rs.30,000}{Rs.25,000} = 1.2:1$

Liquid Assets = Debtors + Bank

= Rs. 16,000 + Rs. 14,000 = Rs. 30,000

Current Liabilities = Creditors + Overdraft + Proposed Dividend

= Rs. 12,000 + Rs. 8,000 + Rs. 5000

= Rs. 25,000

(iii) Fixed Assets Ratio = $\frac{Long\ term\ Funds}{Fixed\ Assets}$

$= \frac{Rs.1,65,500}{Rs.1,40,000} = 1.18:1$

3)

i) Interest Coverage Ratio or Debt Service Ratio

$= \frac{Net\ Profit\ before\ Interest\ and\ Tax}{Fixed\ Interest\ Charges}$

$\frac{Rs.1,56,370 + Rs.1,56,370 + 14,750}{Rs.14,750}$

$\frac{Rs.3,27,490}{Rs.14,750} = 22\,times\,(Approx.)$

ii) Debt to Cash Flow Coverage Ratio

$$\frac{Annual\ Cash\ Flow\ Before\ Interest\ and\ Tax}{Interest + \frac{Sinking\ Fund\ Appropriations}{1 - Tax\ Rate}}$$

$$= \frac{Rs.1,56,370 + Rs.1,56,370 + Rs.14,750 + Rs.20,000}{Rs.14,750 + \frac{12,500}{1.50}}$$

$$= \frac{Rs.3,47,490}{Rs.37,750} = 8.\,times\,(Approx)$$

Check Your Progress 2

1)

i) Current Ratio = $\frac{Current\ Assets}{Current\ Liabilities}$

$$= \frac{\text{Rs.}36{,}000 + 27{,}000 + 6{,}840 + 2{,}160}{\text{Rs.}70{,}200 + 1{,}800}$$

$$= \frac{\text{Rs.}72{,}000}{\text{Rs.}72{,}000} = 1:1$$

ii) Liquidity = $\frac{Liquid\ or\ Quick\ Assets}{Current\ Liabilities}$

Or

Quick Ratio or

$$\frac{Current\ Assets - (Stock + Prepaid\ Exp)}{Current\ Liabilities}$$

$$= \frac{\text{Rs.}72{,}000 - (\text{Rs.}36{,}000 + \text{Rs.}2{,}160)}{\text{Rs.}72{,}000}$$

$$= \frac{\text{Rs.}33{,}840}{\text{Rs.}72{,}000} = 0.47:1$$

Check Your Progress 3

1)

Stock Turnover Ratio = $\frac{Cost\ of\ Goods\ Sold}{Average\ Inventory\ at\ Cost}$

$$= \frac{\text{Rs.}41{,}520}{\text{Rs.}15{,}160} = 2.74 \text{ times}$$

Cost Goods Sold = Opening Stock + Purchases + Carriage Inward – Closing Stock

= Rs. 15,920 + 39,000 + 4,000-14,400

= Rs. 44,520

Average Inventory = $\frac{Opening\ Stock + Closing\ Stock}{2}$

$$= \frac{\text{Rs.}15{,}920 + \text{Rs.}14{,}400}{2}$$

$$= \frac{\text{Rs.}30{,}320}{2} = \text{Rs. } 15{,}160$$

Average Number of days to Turnover = $\frac{Day\ in\ a\ year}{Inventory\ Turnover}$

Or

Stock Velocity = $\frac{365}{2.74}$ =133.21 or 133 days

2)

Average Collection Period = $\frac{Account\ Collection\ Periods}{Net\ Credit\ Sales} \times 365$

$$= \frac{Rs.16{,}500 \text{X} 365}{Rs.1{,}09{,}500}$$

= 55 days

or

$$\text{Average Collection Period} = \frac{365}{\text{Debtors Turnover}}$$

$$= \frac{365}{6.64} = 55 \text{ days}$$

$$\text{Debtors Turnover} = \frac{\text{Net Credit Sales}}{\text{Accounts Receivables}}$$

$$= \frac{Rs.1,09,500}{16,500} = 6.64 \text{ times}$$

(i) Calculation of Accounts Receivables:

= Debtors + Bills Receivable

= Rs. 13,500 + 3,000= Rs. 16,500

(ii) Calculation of Net Credit Sales:

= Total Gross Sales – Cash Sales- Sales Returns

Rs. 1,50,000- 30,000-10,500= Rs. 1,09,500

3)

$$\text{Creditors Turnover} = \frac{\text{Net Credit Purchases}}{\text{Total Payable}(Crs. + B/P)}$$

$$= \frac{Rs.7,30,000}{Rs.1,40,000}$$

$$= \frac{73}{14} = 5.21 \text{ times}$$

$$\text{Average Payable Period} = \frac{\text{Total Payables}}{\text{Net Credit Purchases}} \times 365$$

$$= \frac{Rs.1,40,000}{Rs.7,30,000} \times 365 = 70 \text{ days}$$

or

$$= \frac{\text{Days in a Year}}{\text{Creditors Turnover}}$$

$$= \frac{365}{5.21} = 70 \text{ days}$$

(i) Total Payables = Creditors + Bills Payable

= Rs. 1,20,000 + 20,000

Rs. 1,40,000

(ii) Net Credit Purchases = Total Purchases – Cash Purchases- Returns

= Rs. 8,40,000 – 70,000 – 40,000

= 7,30,000

(iii) The amount of provision for discount on creditors will not be deducted from the creditors.

4)

(i) Capital Turnover Ratio $= \dfrac{Sales}{Capital\ Employed}$

$= \dfrac{\text{Rs.}1{,}60{,}000}{\text{Rs.}2{,}30{,}000} = 0.69$ times

(ii) Capital Employed:

Fixed Assets	1,60,000	
Add: Current Assets:		
Debtors	60,000	
Bills Receivables	20,000	
Cash in Bank	50,000	
	30,000	
Less: Current Liabilities:		
Creditors + B/P (40,000 + 20,000)	60,000	70,000
Capital Employed	2,30,000	

Or

Share Capital	80,000
Add: General Reserve	30,000
Profit and Loss A/c	50,000
Mortgage Loan	80,000
	2,40,000
Less: Preliminary Expenses	10,000
	2,30,000

(i) Fixed Assets Turnover Ratio $= \dfrac{Sales}{Fixed\ Assets}$

$= \dfrac{\text{Rs.}1{,}60{,}000}{\text{Rs.}1{,}60{,}000} = 1$ time

(ii) Working Capital Turnover Ratio $= \dfrac{Sales}{Working\ Capital}$

$= \dfrac{\text{Rs.}1{,}60{,}000}{\text{Rs.}70{,}000} = 2.28$ times

(iii) Current Asset Turnover Ratio $= \dfrac{Sales}{Current\ Assets}$

$= \dfrac{\text{Rs.}1{,}60{,}000}{\text{Rs.}1{,}30{,}000} = 1.23$ times

(iv) Total Assets Turnover Ratio $= \dfrac{Sales}{Total\ Assets}$

$= \dfrac{\text{Rs.}1{,}60{,}000}{\text{Rs.}2{,}90{,}000} = 0.55$

Check Your Progress 4

1)

i) Gross Profit Ratio $= \frac{Gross\ Profit}{Sales} \times 100$

$$= \frac{Rs.3,84,000}{Rs.8,00,000} \times 100 = 48\%$$

ii) Operating Profit Ratio $= \frac{Operating\ Profit}{Net\ Sales} \times 100$

$$= \frac{Rs.2,80,000}{Rs.8,00,000} \times 100 = 35\%$$

Operating Profit :

Net Profit + Non-operating Expenses – Non-operating Income

= Rs. 2,81,200+Rs.3,400 – Rs.4, 600 = Rs. 2,80,000

iii) Operating Ratio =

$$\frac{Cost\ of\ Goods\ Sold + Operating\ Expenses}{Net\ Sales} \times 100$$

$$= \frac{Rs.4,16,000 + Rs.1,04,000}{Rs.8,00,000} \times 100$$

$$= \frac{Rs.5,20,000}{Rs.\ 8,00,000} \times 100 = 65\%$$

Cost of Goods Sold:

Operating Stock +Purchase + Direct Exp – Closing Stock

= Rs. 60,000+Rs.4, 20,000+Rs. (28,000+8,000) – 1,00,000 = Rs. 4,16,000

Operating Expenses

Office Expenses + Selling and Distribution Expenses

= Rs. 48,000+Rs. 56,000

= Rs. 1,04,000

iv) a) Office Expenses Ratio= $\frac{Office\ Expenses}{Net\ Sales} \times 100$

$$= \frac{Rs.48,000}{Rs.8,00,000} \times 100 = 6\%$$

b) Selling and Distribution Expenses Ratio:

$$\frac{Selling\ and\ Distribution\ Expenses}{Net\ Sales}\times 100$$

$$=\frac{\text{Rs.}56{,}000}{\text{Rs.}8{,}00{,}000}\times 100 = 7\%$$

c) Non-Operating Expenses Ratio =

$$\frac{\text{Non}-\text{operating Exp}}{\text{Net Sales}}\times 100$$

$$=\frac{\text{Rs.}3{,}400}{\text{Rs.}8{,}00{,}000}\times 100 = 0.425\%$$

v) Net Profit Ratio= $\dfrac{\text{Net Profit}}{\text{Net Sales}}\times 100$

$$=\frac{\text{Rs.}2{,}81{,}200}{\text{Rs.}8{,}00{,}000}\times 100 = 35.15\%$$

2)

1) Return on Capital Employed = $\dfrac{Net\ Profit\ After\ Tax}{Capital\ Employed}\times 100$

$$\frac{\text{Rs.}1{,}50{,}000}{\text{Rs.}11{,}00{,}000}\times 100 = 13.63\%$$

2) Return on Equity Shareholders' Funds:

$$\frac{Net\ Profit\ \ after\ tax - Pref.\ Share\ Dividend\ Operating\ Profit}{Equity\ Shareholders,\ Funds}\times 100$$

$$=\frac{\text{Rs.}1{,}50{,}000 - \text{Rs.}16{,}000}{\text{Rs.}\,7{,}50{,}000}\times 100 = 35\%$$

3) Return on Total Assets $= \dfrac{Net\ Profit\ aftertax}{TotalAssets}\times 100$

$$=\frac{\text{Rs.}1{,}50{,}000}{\text{Rs.}11{,}25{,}000}\times 100 = 13.33\%$$

$$\frac{Net\ Profit\ \ after\ tax + Interest}{Total\ \ Assets}\times 100$$

$$=\frac{\text{Rs.}1{,}50{,}000 + \text{Rs.}\,23{,}500}{\text{Rs.}11{,}25{,}000}\times 100$$

$$=\frac{\text{Rs.}1{,}73{,}500}{\text{Rs.}11{,}25{,}000}\times 100 = 15.42\%$$

Check Your Progress 5

1) Dividend Yield on Equity Shares = $\frac{Dividend\ Per\ ShareNet}{Marked\ \Pr ice\ Per\ Share} \times 100$

$$= \frac{\text{Rs.}\,2\,(20\%\,\text{of Rs.}10)}{\text{Rs.}\,40} \times 100 = 5\%$$

$$\frac{Net\ Profit\ after\ tax - Pref.Dividend}{No.of\ \ Equity\ Shares} \times 100$$

2) Earnings per Equity Share = $\frac{\text{Rs.}\,2{,}70{,}000 - \text{Rs.}\,27{,}000}{\text{Rs.}\,80{,}000}$

$$= \frac{\text{Rs.}\,2{,}43{,}000}{\text{Rs.}\,80{,}000}\,\text{Rs.}\,3.04$$

3) Price Earning Ratio = $\frac{Market\ Price\ Per\ Share}{Earning\ Per\ Share} \times 100$

$$= \frac{\text{Rs.}\,40}{\text{Rs.}\,3.04} \times 13.16:1$$

4) Dividend Pay-out Ratio = $\frac{Dividend\ \ per\ share}{Earning\ Per\ Share} \times 100$

$$= \frac{2}{\text{Rs.}\,3.04} \times 100 = 66\%$$

UNIT 1 INTRODUCTION TO FINANCIAL MANAGEMENT

Structure Nos. **Page**

1.0 INTRODUCTION

Finance is the application of economic principles and concepts to business decision making and problem solving. The field of finance broadly consists of three categories: Financial Management, Investments and Financial Institutions.

i) **Financial Management:** This area is concerned with financial decision making within a business entity. Financial management decisions, include maintaining optimum cash balance, extending credit, mergers and acquisitions, raising of funds and the instruments to be used for raising funds and the instruments to be used for raising funds etc.

ii) **Investments:** This area of finance focuses on the behaviour of financial markets and pricing of financial instruments.

iii) **Financial Institutions:** This area of finance deals with banks and other financial institutions that specialises in bringing supplier of funds together with the users of funds. There are three categories of financial institutions which act as an intermediary between savers and users of funds, viz., banks, developmental financial institution and capital markets.

Financial management is broadly concerned with the acquisition and use of funds by a business firm. The scope of financial management has grown in recent years, but traditionally it is concerned with the following:

- How large should a firm be and how fast should it grow?
- What should be the composition of the firm's assets?
- What should be the mix of the firm's financing?
- How should the firm analyse, plan and control its financial affairs?

The past two decades have witnessed several rapid changes on the economic and corporate front which have an important bearing on how firms are run and managed. On the one hand we have witnessed economies of several countries opening up

thereby throwing new opportunities and on the other hand we have also witnessed that the growth rate of developed countries are stagnating or even declining. The impact of these changes is that the firms have to move out of the saturated markets and explore new markets.

1.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the role and scope of financial management;
- understand the evolution of financial management;
- understand the various decisions taken by financial managers, and
- understand the concept of economic and accounting profit.

1.2 EVOLUTION OF FINANCIAL MANAGEMENT

The evolution of financial management may be divided into three broad phases:

i) The traditional phase
ii) The transitional phase
iii) The modern phase.

In the traditional phase the focus of financial management was on certain events which required funds e.g., major expansion, merger, reorganisation etc. The traditional phase was also characterised by heavy emphasis on legal and procedural aspects as at that point of time the functioning of companies was regulated by a plethora of legislation. Another striking characteristic of the traditional phase was that, a financial management was designed and practiced from the outsiders point of view mainly those of investment bankers, lenders, regulatory agencies and other outside interests.

During the transitional phase the nature of financial management was the same but more emphasis was laid on problems faced by finance managers in the areas of fund analysis planning and control.

The modern phase is characterised by the application of economic theories and the application of quantitative methods of analysis. The distinctive features of the modern phase are:

- Changes in macro economic situation that has broadened the scope of financial management. The core focus is how on the rational matching of funds to their uses in the light of the decision criteria.
- The advances in mathematics and statistics have been applied to financial management specially in the areas of financial modeling, demand forecasting and risk analysis.

1.3 SIGNIFICANCE OF FINANCIAL MANAGEMENT

The main objective of financial management is, to make optimum utilisation of resources which results in maximum profits. The last five decades have witnessed rapid industrial development and policies of globalisation and liberalisation as a result of which financial activities have undergone tremendous changes. The success or the failure of business operations largely depends upon the financial policies pursued by the firm; as **Irwin Friend** has said “a firm’s success and even survival, its

ability and willingness to maintain production and to invest in fixed or working capital are to a very considerable extent determined by its financial policies both past and present. In modern time where the ownership of firms is more dispersed, there is a separation of ownership and management and the firms are focusing toward social responsibility the role of financial management has spanned beyond planning and control". In the words of **Ezra Soloman** "Financial management is properly viewed as an integral part of overall management rather than as a staff specialty concerned with fund raising operations. In addition to raising funds, financial management is directly concerned with production, marketing and other functions within an enterprise where decisions are made about the acquisition or distribution of assets". The significance of financial management is discussed as follows:

1) **Determination of Business Success:** Sound financial management leads to optimum utilization of resources which is the key factor for successful enterprises. If we analyse the factors which lead to an enterprise turning sick one of the main factors would be mismanagement of financial resources. Financial Management helps in preparation of plans for growth, development, diversification and expansion and their successful execution.

2) **Optimum Utilisation of Resources:** One of the basic objectives of financial management is to measure the input and output in monetary terms. Since finance managers are responsible for the allocation of resources, they are also responsible to ensure that resources are used in an optimum manner. In fact, the failure of business enterprise is not due to inadequacy of financial resources, but is the result of defective management of financial resources. In a country like India, where capital is scarce effective utilisation of financial resources is of great significance.

3) **Focal Point of Decision Making:** Financial management is the focal point of decision-making as it provides various tools and techniques for scientific financial analysis. Some of the techniques of financial management are comparative financial statement, budgets, ratio analysis, variance analysis, cost- volume, profit analysis, etc. These tools help in evaluating the profitability of the project.

4) **Measurement of Performance:** The performance of the firm is measured by its financial results. The value of the firm is determined by the quantum of earnings and the associated risk with these earnings. Financial decisions which increases earnings and reduces risk will enhance the value of the firm.

5) **Basis of Planning, Co-ordination and Control:** Each and every activity of the firm requires resource outlays which are ultimately measured in monetary terms. The finance department being the nodal department is closely associated with the planning of most of the activities of the various departments. Since most of the activities of the firm require co-ordination among various departments, the finance department facilitates this co-ordination by supplying the requisite information. Since the result of various activities are measured in monetary terms, again the finance department is closely involved in control and monitoring activities.

6) **Advisory Role:** The finance manager plays an important role in the success of any organisations.

7) **Information Generator for Various Stakeholders:** In this modern era where business managers are trustees of public money, it is expected that the firm provides information to the various stakeholders about the functioning of the firm. One of the major objectives of financial management is to provide timely information to various stakeholders.

1.4 PRINCIPLES OF FINANCIAL MANAGEMENT

The broad principles of corporate finance are:

1) Investment Decision
2) Financing Decision
3) Dividend Decision
4) Liquidity Decision

1.4.1 Investment Decision

The firm has scarce resources that must be allocated among competing uses. On the one hand the funds may be used to create additional capacity which in turn generates additional revenue and profits and on the other hand some investments results in lower costs. In financial management the returns, from a proposed investment are compared to a minimum acceptable hurdle rate in order to accept or reject a project. The hurdle rate is the minimum rate of return below which no investment proposal would be accepted. In financial management we measure (estimate) the return on a proposed investment and compare it to minimum acceptable hurdle rate in order to decide whether or not the project is acceptable. The hurdle rate is a function of riskness of the project, riskier the project higher the hurdle rate. There is a broad argument that the correct hurdle rate is the opportunity cost of capital. The opportunity cost of capital is the rate of return that an investor could earn by investing in financial assets of equivalent risk.

1.4.2 Financing Decision

Another important area where financial management plays an important role is in deciding when, where, from and how to acquire funds to meet the firm's investment needs. These aspects of financial management have acquired greater importance in recent times due to the multiple avenues from which funds can be raised. Some of the widely used instruments for raising finds are ADRs, GDRs, ECBs Equity Bonds and Debentures etc. The core issue in financing decision is to maintain the optimum capital structure of the firm that is in other words, to have a right mix of debt and equity in the firm's capital structure. In case of pure equity firm (Zero debt firms) the shareholders returns should be equal to the firm's returns. The use of debt affects the risk and return of shareholders. In case, cost of debt is used the firm's rate of return the shareholder's return is going to increase and vice versa. The change in shareholders return caused by change in profit due to use of debt is called the financial deverage.

1.4.3 Dividend Decision

Dividend decisions is the third major financial decision. The share price of a firm is a function of the cash flows associated with the share. The share price at a given point of time is the present value of future cash flows associated with the holding of share. These cash flows are dividends. The finance manager has to decide what proportion of profits has to be distributed to the shareholders. The proportion of profits distributed as dividends is called the dividend pay out ratio and the retained proportion of profits is known as retention ratio. The dividend policy must be designed in a way, that it maximises the market value of the firm's share. The retention ratio depends upon a host of factors– the main factor being the existence of investment opportunities. The investors would be indifferent to dividends if the firm is able to earn a rate or return which is higher than the cost of the capital. Dividends are generally paid in cash, but a firm may also issue bonus shares. Bonus share are shares issued to the existing shareholders without any charge. As far as dividend decisions are concerned the finance manager has to decide on the question of dividend stability, bonus shares, retention ratio and cash dividend.

1.4.4 Liquidity Decision

A firm must be able to fulfill its financial commitments at all points of time. In order to ensure this the firm should maintain sufficient amount of liquid assets. Liquidity decisions are concerned with satisfying both long and short-term financial

commitments. The finance manager should try to synchronise the cash inflows with cash outflows. An investment in current assets affect the firm's profitability and liquidity. A conflict exists between profitability and liquidity while managing current assets. In case, the firm has insufficient current assets it may default on its financial obligations. On the other hand excess funds result in foregoing of alternative investment opportunities.

☞ Check Your Progress 1

1) List the three broad phases of evolution of financial management.

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2) List the significance of financial management.

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3) What are the major principles of financial management?

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1.5 OBJECTIVES OF FINANCIAL MANAGEMENT

For optimal financial decisions, it is essential to define objectives of financial management. These objectives serve as decision-criterion. Financing is a functional area of business and, therefore, the objectives of financial management must be in tune with the overall objectives of the business. The main objectives of business are survival and growth. In order to survive in the business and to grow, a business must earn sufficient profits. It must also maintain good relations with investors, employees, customers and other groups of society. Financial management of an organisation may seek to achieve the following objectives:

- ensure adequate and regular supply of funds to the business,
- provide a fair rate of return to the suppliers of capital,
- ensure efficient utilisation of capital according to the principles of profitability, liquidity and safety,
- devise a definite system for internal investment and financing,
- minimise cost of capital by developing a sound and economical combination of corporate securities,
- co-ordinate the activities of the finance department with the activities of other departments of the organisation.

Generally, maximisation of economic welfare of its owners is accepted as the financial objective of the firm. But, the question is, how does one maximise the

owners' economic welfare? Financial experts differ while finding a solution to this problem. There are two well known criteria in this regard:

i) Profit Maximisation
ii) Wealth Maximisation.

Profit Maximisation

The basic objective of every business enterprise is the welfare of its owners. It can be achieved by the maximisation of profits. Therefore, according to this criterion, the financial decisions (investment, financing and dividend) of a firm should be oriented to the maximisation of profits (i.e. select those assets, projects and decisions which are profitable and reject those which are not profitable). In other words, actions that increase profits are be undertaken and those that decrease profits are to be avoided. Profit maximisation as an objective of financial management can be justified on the following grounds:

1) Rational
2) Test of Business Performance
3) Main Source of Inspiration
4) Maximum Social Welfare
5) Basis of Decision-Making

Drawbacks of Profit Maximisation Concept

1) It is vague
2) It ignores time value of money
3) It ignores risks
4) It ignores social responsibility

From the above description, it can be easily concluded that profit maximisation criterion is inappropriate and unsuitable as an operational objective of financial management. In imperfect competition, the profit maximisation criterion will certainly encourage concentration of economic power and monopolistic tendencies. That is why, the objective of wealth maximisation is considered as the appropriate and feasible objective as against the objective of profit maximisation.

We shall discuss this criteria in detail and arrive at a satisfactory conclusion to determine the goals or objectives of financial management.

Wealth Maximisation

The objective of profit maximisation, as discussed above, is not only vague and ambiguous, but it also ignores the two basic criteria of financial management i.e. (i) risk and (ii) time value of money. Therefore, wealth maximisation is taken as the basic objective of financial management, rather than profit maximisation. It is also known as 'Value Maximisation' or 'Net Present Value Maximisation'. According to **Ezra Soloman** of Stanford University, the ultimate objective of financial management should be the maximisation of wealth. **Prof. Irwin Friend** has also supported this view.

Wealth Maximisation means to maximise the net present value (or wealth) (NPV) of a course of action. It NPV is the difference between the gross present value of the benefits of that action and the amount of investment required to achieve those benefits. The gross present value of a course of action is calculated by discounting or capitalising its benefits at a rate which reflects their timings and uncertainty.

Superiority of Wealth Maximisation

We have discussed the goals or objectives of financial management. Now, the question arises as to the choice i.e., which should be the goal of financial management in decision –making i.e., profit maximisation or wealth maximisation. In present day changed circumstances, wealth maximisation is a better objective because it has the following points in its favour:

- It measures income in terms of cash flows, and avoids the ambiguity now associated with accounting profits as, income from investments is measured on the basis of cash flows rather than on accounting profits.
- It recognises time value of money by discounting the expected income of different years at a certain discount rate (cost of capital).
- It analyses risk and uncertainty so that the best course of action can be selected from different alternatives.
- It is not in conflict with other motives like maximisation of sales or market value of shares. It helps rather in the achievement of all these other objectives.

Therefore, maximisation of wealth is the operating objective by which financial decisions should be guided.

1.6 ECONOMIC PROFIT VS. ACCOUNTING PROFIT

Economic profit is the difference between revenues and costs where costs include both the actual businesses costs (the explicit costs) and the implicit costs. The implicit costs are the payments that are necessary to secure the needed resources, the cost of capital. Accounting profits is the difference between revenues and costs recorded according to accounting principles. The implicit cost-opportunity cost and normal profits which reflects the uncertainty and timing of future cash flows are not taken into consideration in according profits.

Economic Value Added

i) Calculate the firm's operating profit
ii) Calculate the cost of capital
iii) Compare operating profit with cost of capital.

A related measure of economic profit is market value added (MVA), which focuses on the market value of capital as compared to the cost of capital.

- Calculate the market value of capital
- Calculate the amount of capital invested.
- Compare the market value of capital with capital invested.

In theory market value added is the present value of all expected future economic profits.

In a nutshell financial decisions are concerned, with the firm's decision to acquire and dispose off assets and commitment of funds on a continuous basis. Financial decisions affect the size, growth, profitability, risk and ultimately, the Value of the firm.

1.7 AGENCY RELATIONSHIP

When firms are small they usually function as sole proprietorship firms or partnership firms where owner/partners make the decisions. As the volume and complexity of

business increases the sole proprietorship partnership firms convert themselves into public limited companies or joint stock companies. With increased geographical

spread and other complexities often it is not possible for owners to look after all the aspects of the business. The decision making power is delegated to the managers (agents). An agent is a person who acts for, and exerts power on behalf of another person or group of persons. The person (or group of persons) whom the agent represents is referred to as the principal. The relationship between the agent and the principal is an agency relationship. There is an agency relationship between the managers and shareholders of a company.

1.7.1 Problems Related with Agency Relationship

In an agency relationship the agent is charged with the responsibility of acting for the principal and in the best interest of the principal. But, it is possible that the agent may act in a fashion which serves his/her own self-interest rather than that of the principal. In recent years we have witnessed numerous corporate frauds i.e. Enron, Xerox, etc., where the agents had misappropriated the authority vested in them by the principal. The problems associated with agency relationship can manifest itself in many ways. The most common being the misuse of power and authority by the managers, which includes financial misappropriation, using the funds of the company for the personal self (fringe benefits) etc. In case the reward and compensations are based on certain parameters, for example sales; managers may indulge in practices which would yield result in the short run but prove detrimental in the long run, i.e., overstocking the various intermediaries in the supply chain, offering huge discounts, dumping of goods in the territory of another manager etc. Another facet of this problem is, where managers put a little effort towards expanding and exploring the market for new business. In a nutshell the problems with agency relationship is that the managers act in a fashion which serves their own interest rather than that of the shareholders.

1.7.2 Costs of the Agency Relationship

In order to minimise the potential for conflict between the principal's interest and the agent's interest certain costs are to be incurred by the principal as well as the agent and the cumulative effect of these costs is referred to as the agency costs. Agency costs are of three types: monitoring costs, bonding costs and residual cost.

Monitoring Costs

These are the costs incurred by the principal to monitor and limit the actions of the agent. In companies the shareholders may require the managers to periodically report on their activities via audited financial statements. The cost of resources spent on preparing these statements is monitoring cost. Another example is the implicit cost incurred when the principal limits the decision making power of the agent; by doing so, the principal may miss profitable investment opportunities. The foregone profit is the monitoring cost.

Bonding Costs

These are the costs incurred by the agents to assure the principal that they will act in the best interest of the principal.

Residual Costs

Residual costs is the remaining costs after taking into consideration of the above costs (i.e., monitoring costs, bonding costs).

1.8 THE CHANGING FINANCIAL LANDSCAPE

The past two decades have been witnessing radical changes in the financial system world over. The significant changes which has been taking place over the years are:

a) Low interest rate regime
b) Exchange control and convertibility

c) Development of capital markets
d) Less intermediation
e) Introduction of hybrid financial instruments
f) Increase in risk exposure
g) Volatility in commodity prices
h) Substantial lowering of custom duty (Removal of trade barriers).

These changes coupled with changing customer needs, technology driven innovations and regulatory changes are imposing substantial changes in the financial systems world over.

The impacts of these changes are as follows:

1) Increased competitions have resulted in the rationalisation of pricing and costs. Companies having high cost structure are being forced to rationalise operations.
2) National financial system is now more closely integrated with international financial system.

1.9 ORGANISATION OF FINANCIAL MANAGEMENT

Organisation of financial management means the division and the classification of various functions which are to be performed by the finance department.

In small organisations where partners or proprietors have main say in the running of the firm, no separate finance department is established. At the most they may appoint a person for book keeping and liasioning with banks and debtors.

In medium size organisations a separate department to organise all financial activities may be created at the top level under the direct supervision of the Board of Directors or a very senior executive. The important feature of this type of set up is that there is no further sub division based on various functional areas of finance.

In large size organisations the finance department is further sub divided into functional areas. In these organisations two main sub-divisions are that of the Financial Controller and the Treasurer. The Financial Controller is concerned with planning and controlling, preparation of annual reports, capital and working capital budgeting, cost and inventory management maintenance of books and records and pay-roll preparation. The treasurer is concerned with raising of funds both short term and long term. In addition to this the treasurer is responsible for cash and receivable management, auditing of accounts, protection and safe keeping of securities and the maintenance of relations with banks and institutions.

1.10 TASKS AND RESPONSIBILITIES OF MODERN FINANCIAL MANAGER

The task and responsibilities of finance managers vary from organisation to organisation depending upon the nature and size of the business, but inspite of these variations the main tasks and responsibilities of finance manager can be classified as follows:

a) Compliance with policy and procedures laid by the Board of Directors.
b) Compliance with various rules and procedures as laid by law.
c) Information generation for various stakeholders.
d) Effective and efficient utilisation of funds.

The main tasks and responsibilities of a financial manager are discussed below:

1) **Financial Planning and Forecasting:** Financial manager is also concerned with planning and forecasting of production, sales and level of inventory.

In addition to this, he has also to plan and forecast the requirement of funds and the sources from which the funds are to be raised.

2) **Financial Management:** Fund management is the primary responsibility of the finance manager. Fund management includes effective and efficient acquisition, allocation and utilisation of funds. The fund management includes the following:

- ***Acquisition of funds:*** The finance manager has to ensure that adequate funds are available from the right sources at the right cost at the right time. The finance manager will have to decide the mode of raising fund, whether it is to be through the issue of securities or lending from the bank.

- ***Allocation of funds:*** Once funds are acquired the funds have to be allocated to various projects and services as per the priority fixed by the Board of Directors.

- ***Utilisation of funds:*** The objective of business finance is to earn profiles, which on a very large extent depend upon how effectively and efficiently allocated funds are utilised. Proper utilisation of funds is based on sound investment decisions, proper control and asset management policies and efficient management of working capital.

3) **Disposal of Profits:** Finance manager has to decide the quantum of dividend which the company wants to declare. The amount of dividend will depend upon mainly the future requirement of funds for expansion and the prevailing tax policy.

4) **Maximisation of Shareholder's Wealth:** The objective of any business is to maximise and create wealth for the investors, which is measured by the price of the share of the company. The price of the share of any company is a function of its present and expected future earnings. The finance managers should pursue policies which maximises earnings.

5) **Interpretation and Reporting:** Interpretation of financial data requires skills. The finance manager should analyse financial data and find out the reasons for variance from standards and report the same to the management. He should also assess the likely financial impact of these variances.

6) **Legal Obligations:** All the companies are governed by specific laws of the land. These laws relate to payment of taxes, salaries, pension, corporate governance, preparation of accounts etc. The finance manager should ensure that a true and correct picture of the state of affairs should be reflected in the statement of accounts. He should also ensure that the tax returns and various other information should be submitted on time.

☞ Check Your Progress 2

1) What are the significant changes taking place in the financial system?

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2) List the main tasks and responsibilities of a Financial Manager.

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1.11 SUMMARY

Financial Management has undergone several changes over the last five decades as more and more companies are raising funds from markets both domestic and overseas. The modern phase of financial management is characterised by the application of economic theories and advanced mathematical and statistical tools. Financial management's significance is increasing day by day as it play the role of facilitator among various departments. The objective of the firm has also changed from profit maximisation to that of wealth maximisation. The agency problem is concerned with how managers behave when, delegated with decision making powers.

1.12 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) "Finance is the life blood of industry." Elucidate this statement with suitable illustrations.

2) What is the finance function? Explain in brief the different approaches (or concepts) to Finance Function.

3) What is Financial Management? How does a modern financial management differ from traditional financial management?

4) What is meant by 'Financial Management'? What are the salient features of Financial Management?

5) Define Financial Management and discuss its main functions.

6) Explain the scope of financial management. What role should the financial manager play in modern enterprise?

7) What do you understand by 'Financial Management'? Discuss its significance in business management.

8) "The importance of financial management has increased in modern times". Elucidate.

9) "Sound Financial Management is a key to the progress for corporation." Explain.

10) "Without adequate finance no business can survive and without efficient financial management, no business can prosper and grow." Comment on this statement bringing out the role of financial management.

11) Discuss the objectives and goals of Financial Management.

1.13 SOLUTIONS/ANSWERS

Check Your Progress 1

1) The three broad phases of evolution of financial management are as follows:

a) The traditional phase
b) The transitional phase
c) The modern phase

2) The significance of financial management are:

a) Determination of business success
b) Optimum utilisation of resources
c) Focal point of decision making
d) Measurement of performance
e) Basis of planning coordination and control
f) Advisory role
g) Information generator for various stakeholders

3) The broad principles of corporate finance are:

a) Investment Decision
b) Financing Decision
c) Dividend Decision
d) Liquidity Decision

Check Your Progress 2

1) The following are the significant changes taking place in the financial system:

a) Low interest rate regime
b) Exchange control and convertibility
c) Development of capital markets
d) Less intermediation
e) Introduction of hybrid financial instruments
f) Increase in risk exposure
g) Volatility in commodity prices
h) Substantial lowering of custom duty

2) The main tasks and responsibilities of a financial manager are

a) Financial planning and forecasting
b) Financial management
c) Disposal of profits
d) Maximisation of shareholder's wealth
e) Interpretation and reporting
f) Legal obligations

UNIT 2 TIME VALUE OF MONEY

Structure **Page Nos.**

2.0 INTRODUCTION

The notion that money has time value is one of the most basic concepts of investment analysis. For any productive asset it's value will depend upon the future cash flows associated with that particular asset. In order to assess the adequacy of cash flows one of the important parameters is to assess the time value of the cash flows viz., Rs.100 received after one year would not be the same as Rs.100 received after two years. There are several reasons to account for this difference based on the timing of the cash flows, some of which are as follows:

- there is a general preference for current consumption to future consumption,
- capital (savings) can be employed to generate positive returns,
- due to inflation purchasing power of money decreases over time,
- future cash flows are uncertain.

Translating the current value of money into its equivalent future value is referred to as compounding. Translating a future cash flow or value into its equivalent value in a prior period is referred to as discounting. This Unit deals with basic mathematical techniques used in compounding and discounting.

2.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the time value of money;
- understand what gives money its time value;
- understand the methods of calculating present and future value, and
- understand the use of present value technique in financial decisions.

2.2 DETERMINING THE FUTURE VALUE

Let us suppose that you deposit Rs.1000 with a bank which pays 10 per cent interest compounded annually for a period of 3 years. The deposit will grow as follows:

First Year	Principal at the beginning. Interest for the year (1000x.10) Total amount	Rs. 1000 100 1100
Second Year	Principal at the beginning. Interest for the year (1100x.10). Total Amount	1100 110 1210
Third Year	Principal at the beginning. Interest for the year (1210x.10) Total Amount	1210 121 1321

To get the future value from present value for a one year period

$$FV = PV + (PV \times k)$$

where PV = Present Value
k = Interest rate

$$FV = PV(1+k)$$

Similarly for a two year period

$FV = PV$	$+ (PV \times k)$	$+ (PV \times k)$	$+ (PV \times k \times k)$
Principal amount	First period interest on principal	Second period interest on the principal	Second periods interest on the first periods interest

$$FV = PV+PVk+PVk+PVk^2$$
$$= PV+2PVk+PVk^2$$
$$= PV\ (1+2k+K^2) = PV\ (1+k)^2$$

Thus, the future value of amount after n periods is (2.1)

$$FV = PV\ (1+k)^n$$

where FV = Future value n years hence
PV = Cash today (present value)
k = Interest rate par year in percentage
n = number of years for which compounding is done

Equation (2.1) is the basic equation for compounding analysis. The factor $(1+k)^n$ is refered to as the compounding factor or the future value interest factor (FVIFk,n). Published tables are available showing the value of $(1+k)^n$ for various combinations of k and n. One such table is given in appendix A of this unit.

Example 2.1 Find out the future value of Rs.1000 compounded annually for 10 years at an interest rate of 10%.

Solution: The future value 10 years hence would be

$$FV = PV\ (1+k)^n$$
$$FV = 1{,}000\ (1+.10)^{10}$$
$$= 1000 \times (1.10)^{10}$$
$$= 1000\ (2.5937)$$
$$= 2593.7$$

The appreciation in present value of an amount can also be expressed in terms of return. A return is the income on investment over each period divided by the amount

of investment at the beginning of the period. From the above example the arithmetic average return would be (2593.7 –1000)/1000=159.37% over the ten year period or 15.937% per year. The main drawback of using arithmetic average is that it ignores the process of compounding. To overcome this, the correct method is to use geometric average return to calculate overage annual return.

Rearranging the equation 2.1 we get

$$k = \sqrt[n]{\frac{FV}{PV}} - 1 \qquad (2.2)$$

using the values from example 2.1

$$= \sqrt[10]{\frac{2593.7}{1{,}000}} - 1$$

$$= \left(\frac{2593.7}{1000}\right)^{1/10} - 1$$

$$= 1.10 - 1$$

$$= .10 = 10\%$$

2.2.1 Shorter Compounding Period

So far in our discussion we have assumed that the compounding is done annually, now let us consider the case where compounding is done more frequently. In this case the equation (2.1) is modified to factor in the change of frequency of compounding.

$$FV_n = PV\left(1 + \frac{k}{m}\right)^{m \times n} \qquad (2.3)$$

where FV_n = Future value after n years
PV = Present Value
K = nominal annual rate of interest
m = Frequency of compounding done during a year
n = number of years for which compounding is done.

If the interest is payable semiannually frequency of compounding is 2, if it is payable monthly frequency is 12, if it is payable weekly frequency is 52 and so on.

Example 2.2 Calculate the future value of Rs.5000 at the end of 6 years, if nominal interest rate is 12 per cent and the interest is payable quarterly (frequency = 4)

Solution:

$$FV_n = PV\left(1 + \frac{k}{m}\right)^{m \times n}$$

$$FV_6 = 5000\left(1 + \frac{.12}{4}\right)^{6 \times 4}$$

$$= 5000(1 + .03)^{24}$$

$$= 5000 \times 2.0328$$

$$= 10{,}164$$

The future value of Rs.5000 after 6 years on the basis of quarterly compounding would be Rs.10 164 whereas in case of semi-annual and annual compounding the future value would be–

$$FV_6 = 5000(1+\frac{.12}{2})^{6\times2}$$
$$= 5000(1+06)^{12}$$
$$= 5000\times2.0122$$
$$= 10{,}061$$

$$FV_6 = 5000\ (1+.12)^6$$
$$= 5000\ (1.9738)$$
$$= 9868$$

This difference in future value is due to the fact that interest on interest has been calculated.

2.2.2 Effective vs. Nominal Rates

In the above example we have seen how the future value changes with the change in frequency of compounding. In order to understand the relationship between effective and nominal rate let us calculate the future value of Rs.1000 at the interest rate of 12 per cent when the compounding is done annually, semiannually, quarterly and monthly.

$$FV = 1000\ (1+.12)^1$$
$$= 1120$$
$$FV = 1000\ (1+\frac{.12}{2})^2$$
$$= 1000\ (1.06)^2$$
$$= 1000(1.1236)$$
$$= 1123.6$$
$$FV = 1000\ (1+\frac{.12}{4})^4$$
$$1000 = (1.03)^4$$
$$1000 = (1.1255)$$
$$= 1125.5$$
$$FV = 1000\ (1+\frac{.12}{12})^{12}$$
$$= 1000\ (1.01)^{12}$$
$$= 1000(1.1268)$$
$$= 1126.8$$

From the above calculations we can see that Rs.1000 grows to Rs.1120, Rs.1123.6, Rs.1125.5 and Rs.1126.8 although the rate of interest and time period are the same. In the above case 12.36, 12.55 and 12.68 are known as effective rate of interest. The relationship between the effective and nominal rate of interest is given by

$$r = (1 + \frac{k}{m})^m - 1 \qquad (2.4)$$

where r = effective rate of interest
k = nominal rate of interest
m = frequency of compounding per year

Based on the above stated example the effective interest rate is calculated as follows:

a) Effective interest rate for monthly compounding

$$r = (1+\frac{.12}{12})^{12}-1$$
$$= (1.01)^{12}-1$$
$$= 1.1268-1$$
$$= .1268=12.68$$

b) Effective interest rate for quarterly compounding

$$r = (1+\frac{12}{4})^{4}-1$$
$$r = (1.03)^{4}-1$$
$$r = 1.1255-1=.1255$$
$$= 12.55\%$$

c) Similarly the effective interest rate for semi-annual compounding is

$$r = (1+\frac{12}{2})^{2}-1$$
$$r = (1.06)^{2}-1$$
$$r = 1.1236-1=.1236=12.36$$

Doubling Period

One of the first and the most common questions regarding an investment alternative is the time period required to double the investment. One obvious way is to refer to the table of compound factor from which this period can be calculated. For example the doubling period at 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 12% would be approximately 23 years, 18 years, 14 years, 12 years, 10 years, 9 years, 8 years, 7 years, and 6 years respectively.

If one is not inclined to use future value interest factor tables there is an alternative, known as rule of 72. According to this rule of thumb the doubling period is obtained by dividing 72 by the interest rate. For example, at the interest rate of 8% the approximate time for doubling an amount would be 72/8 = 9 years.

A much more accurate rule of thumb is rule of 69. As per this rule the doubling period is equal to

$$.35+\frac{69}{\text{Interest rate}}$$

Using this rule the doubling period for an amount fetching 10 percent and 15 percent interest would be as follows.

$$.35+\frac{69}{10}=.35+6.9=7.25\text{ years}$$
$$.35+\frac{69}{15}=.35+4.6=4.95\text{ years}$$

2.2.3 Continuous Compounding

The extreme frequency of compounding is continuous compounding where the interest is compounded instantaneously. The factor for continuous compounding for one year is eAPR where e is 2.71828 the base of the natural logarithm. The future value of an amount that is compounded for n years is

$$FV = PV \times e^{kn}$$

Where k is annual percentage rate and e^{kn} is the compound factor.

Example 2.3: Find the future value of Rs.1000 compounded continuously for 5 year at the interest rate of 12% per year and contrast it with annual compounding.

Solution: $FV_{\overline{5}} = PVe^{N(APR)}$

$= 1000 \times 2.71828$

$= 1000 \times 2.71828^{.60}$

$= 1000 \times 1.82212$

$= 1822.12$

$FV_{\overline{5}} = PV(1+k)^n$

$= 1000(1+.12)^5$

$= 1000(1.7623)$

$= 1762.3$

From this example you can very well see the effects of extreme frequency of compounding.

So far in our discussion we have assumed that the interest rate is going to remain the same over the life of the investment, but now a days we are witnessing an increased volatility in interest rates as a result of which the financial instruments are designed in a way that interest rates are benchmarked to a particular variable and with the change in that variable the interest rates also change accordingly.

In such cases the Future Value is calculated through this equation.

$$FV_n = PV(1+k_1)(1+k_2)(1+k_3)+... \quad (1+k_n) \qquad (2.5)$$

Where k_n is the interest rate for period n.

Example 2.4: Consider a Rs.50, 000 investment in a one year fixed deposit and rolled over annually for the next two years. The interest rate for the first year is 5% annually and the expected interest rate for the next two years are 6% and 6.5% respectively calculate the future value of the investment after 3 years and the average annual interest rate.

Solution:

$$FV = PV\ (1+k_1)(1+k_2)(1+k_3)$$
$$= 50{,}000(1+.05)(1+.06)(1+.065)$$
$$= 59{,}267.25$$

Average annual interest rate

$$\frac{.05+.06+.065}{3}$$
$$= .58333 \text{ (wrong)}$$

By now we know the values of FV, PV, and n. The average annual interest rate would be

$$k = \sqrt[n]{\frac{FV}{PV}}$$

$$k = \sqrt[3]{\frac{59267.25}{50,000}} = \sqrt[3]{1.185345} = 5.8315\%$$

This is also equivalent to

$$k = \sqrt[3]{(1+.05)(1+.06)(1+.065)} - 1$$

$$= 5.8315$$

☞ Check Your Progress 1

1) Calculate the compound value of Rs. 1000, interest rate being 12% per annum, if compounded annually, semi annually, quarterly and monthly for 2 years.

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2) Calculate the future value of Rs. 1000 deposited initially, if the interest is 12% compounded annually for the next five years.

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3) Mr. X bought a share 15 years ago for Rs. 10, the present value of which is Rs. 27.60. Compute the compound growth rate in the price of the share.

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2.3 ANNUITY

An annuity is defined as stream of uniform period cash flows. The payment of life insurance premium by the policyholder to the insurance company is an example of an annuity. Similarly, deposits in a recurring bank account is also an annuity.

Depending on the timing of the cash flows annuities are classified as:

a) Regular Annuity or Deferred Annuity

b) Annuity Due.

The regular annuity or the deferred annuity are those annuities in which the cash flow occur at the end of each period. In case of an annuity due the cash flow occurs at the beginning of the period.

Example 2.5: Suppose Mr. Ram deposits Rs. 10,000 annually in a bank for 5 years, at 10 per cent compound interest rate. Calculate the value of this series of deposits at the end of five years assuming that (i) each deposit occurs at the end of the year (ii) each deposit occurs at the beginning of the year.

Solution: The future value of regular annuity will be

Rs. $1000\ (1.10)^4 + 1000\ (1.10)^3 + 1000\ (1.10)^2 + 1000\ (1.10) + 1000$

$= 6105.$

The future value of an annuity due will be

Rs. $1000\ (1.10)^5 + 1000\ (1.10)^4 + 1000\ (1.10)^3 + 1000\ (1.10)^2 + 1000\ (1.10)$

$= \text{Rs } 1000\ (1.611) + 1000\ (1.4641) + 1000\ (1.331) + 1000\ (1.21) + 1000\ (1.10)$

$= \text{Rs. } 6716.$

In the above example you have seen the difference in future value of a regular annuity and annuity due. This difference in value is due to the timing of cash flow. In case of regular annuity the last cash flow does not earn any interest, whereas in the case of annuity due, the cash flows earns an interest for one period.

Formula

In general terms the future value of an annuity (regular annuity) is given by the following formula:

$$FVA_n = A(1+k)^{n-1} + A(1+k)^{n-2} + \ldots + A \qquad (2.6)$$

$$= A \sum_{t=1}^{n} (1+k)^{n-t}$$

$$= A\left[\frac{(1+k)^n - 1}{k}\right]$$

Future value of an annuity due

$$FVA_{n(due)}\ A(1+k)^n + A(1+k)^{n-1} + \ldots + A(1+k)$$

$$FVA_{n(due)} = A \sum_{t=1}^{n} (1+k)^{n-t+1} \qquad (2.7)$$

$$= A\left[\frac{(1+k)^n - 1}{k}\right](1+k)$$

Where FVA_n = Future value of an annuity which has a duration of n periods

A = Constant periodic cash flow

k = Interest rate per period

n = duration of the annuity

The term $\left[\frac{(1+k)^n - 1}{k}\right]$ is referred to as the future value interest factor for an annuity ($FVIFA_{k,n}$). The value of this factor for several combinations of k and n are given in the appendix at the end of this unit.

Present Value of an Uneven Series

In real life cash flows occurring over a period of time are often uneven. For example, the dividends declared by the companies will vary from year to year, similarly payment of interest on loans will vary if the interest is charged on a floating rate basis. The present value of a cash flow stream is calculated with the help of the following formula:

$$PV_n = \frac{A_1}{(1+K)} + \frac{A_2}{(1+k)^2} + ... + \frac{A_n}{(1+k)^n} = \sum_{t=1}^{n} \frac{A_t}{(1+k)^t} \qquad (2.8)$$

Where

PV_n = present value of a cash flow stream

A_t = cash flow occurring at the end of the year

k = discount rate

n = duration of the cash flow stream

Shorter Discounting Periods

Sometimes cash flows may have to be discounted more frequently than once a year- semi-annually, quarterly, monthly or daily. The result of this is two fold (i) the number of periods increases (ii) the discount rate applicable per period decreases. The formula for calculating the present value in case of shorter discounting period is

$$PV = FV_n \left[\frac{1}{1+k/m}\right]^{n/m} \qquad (2.9)$$

Where m = number of times per year discounting is done.

Example 2.6: Calculate the present value of Rs. 10,000 to be received at the end of 4 years. The discount rate is 10 percent and discounting is done quarterly.

Solution:

$PV = FV_4 \times PVIF\ k/m, m \times n$
$= 10{,}000 \times PVIF\ 3\%, 16$
$= 10{,}000 \times 0.623$
$=$ Rs. 6230

Determining the Present Value

In the previous sections we have discussed the computation of the future value, now let us work the process in reverse. Let us suppose you have won a lottery ticket worth Rs. 1000 and this Rs. 1000 is payable after three years. You must be interested in knowing the present value of Rs. 1000. If the interest rate is 10 per cent, the present value can be calculated by discounting Rs. 1000 to the present point of time as follows.

Value three years hence = Rs. $1000 \left(\frac{1}{1.10}\right)$

Value one years hence = Rs. $1000 \left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)$

Value now (Present Value) = Rs. $1000 \left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)$

Formula

Compounding translates a value at one point in time into a value at some future point in time. The opposite process translates future value into present value. Discounting translates a value back in time. From the basic valuation equation

$$FV = PV\ (1+k)^n$$

Dividing both the sides by $(1+k)^n$ we get

$$PV = FV \left[\frac{1}{(1+k)}\right]^n \qquad (2.10)$$

The factor $\left[\frac{1}{(1+k)}\right]^n$ is called the discounting factor or the present value interest factor [$PVIF_{k,n}$]

Example 2.7: Calculate the present value of Rs. 1000 receivable 6 years hence if the discount rate is 10 per cent.

Solution: The present value is calculated as follows:

$$\begin{aligned} PV_{kn} &= FV_n \times PVIF_{k,n} \\ &= 1{,}000 \times (0.5645) \\ &= 564.5 \end{aligned}$$

Example 2.8: Suppose you are receiving an amount of Rs.5000 twice in a year for next five years once at the beginning of the year and the other amount of Rs. 5000 at the end of the year, which you deposit in the bank which pays an interest of 12 percent. Calculate the value of the deposit at the end of the fifth year.

Solution: In this problem we have to calculate the future value of two annuities of Rs.5000 having duration of five years. The first annuity is an annuity due and the second annuity is regular annuity, therefore the value of the deposit at the end of five year would be

$$\begin{aligned} &FVA_n + FVA_{n(due)} \\ &= A\left[\frac{(1+k)^n - 1}{k}\right] + A\left[\frac{(1+k)^n - 1}{k}\right](1+k) \\ &= A\,(FVIFA_{12,5}) + A\,(FVIFA_{12,5})\,(1+k) \\ &= 5000\,(6.353) + 5000\,(6.353)(1.12) \\ &= 31{,}765 + 35{,}577 \\ &= 67336 \end{aligned}$$

The value of deposit at the end of the fifth year is Rs. 67,342.

Sinking Fund Factor

Suppose you are interested in knowing how much should be saved regularly over a period of time so that at the end of the period you have a specified amount. To answer this question let us manipulate the equation

$$FVA_n = A\left[\frac{(1+k)^n - 1}{k}\right]$$

which shows the relationship between FVA_n, A, k, and

$$A = \left[\frac{k}{(1+k)^n - 1}\right]^{FVA_n} \qquad (2.11)$$

Equation 2.11 helps in answering this question. The periodic deposit is simply A and is obtained by dividing FVAn by $FVIFA_{k,n}$. In eq 2.11 $\left[\frac{k}{(1+k)^n - 1}\right]$ is the inverse of $FVIFA_{k,n}$ and is called the sinking fund factor.

Example 2.9: How much should you save annually so as to accumulate Rs. 20,00,000 by the end of 10 years, if the saving earns an interest of 12 per cent?

Solution:

$$A = FVA_n \left[\frac{k}{(1+k)^n - 1} \right]$$

$$= Rs.20,000 \times \frac{1}{FVIFA_{12\%,10}}$$

$$= Rs.20,00000 \times \frac{1}{17.548}$$

$$= 1,11,400$$

Present value of an annuity

Let us suppose you expect to receive Rs.2000 annually for the next three years. This receipt of Rs.2000 is equally divided. One part viz., Rs.1000 is received at the beginning of the year and the remaining Rs.1000 is received at the end of the year. We are interested in knowing the present value when the discount rate is10 per cent. The cash flows stated above are of two types which are similar to regular annuity and annuity due. The present value of this cash flow is found out as follows:

a) Present value of Rs.1000 received at the end of each year for three years (Regular annuity).

$$Rs.1000\left(\frac{1}{1.10}\right) + Rs.1000\left(\frac{1}{1.10}\right)^2 + Rs.1000\left(\frac{1}{1.10}\right)^3$$

$$1000 \times 09091 + 1000 \times 08264 + 1000 \times 0.7513$$

$$Rs.2479.$$

b) Present value of Rs.1000 received at the beginning of each year for three year (annuity due)

$$Rs.1000 + Rs1000\left(\frac{1}{1.10}\right) + Rs.1000\left(\frac{1}{1.10}\right)^2$$

$$= 1000 + 1000 \times 0.9091 + 1000 \times 08264$$

$$= Rs.2735$$

The present value of this annuity is Rs. 2479+Rs.2735 = Rs. 5214.

Formula

In general terms the present value of a regular annuity may be expressed as follows:

$$PVN_n = \frac{A}{(1+k)} + \frac{A}{(1+k)^2 +} \ldots\ldots + \frac{A}{(1+k)^n}$$

$$= A\left[\frac{1}{1+k} + \frac{1}{(1+k)^2} + \ldots \frac{1}{(1+k)^n} \right]$$

$$= A\left[\frac{(1+k)^n - 1}{k(1+k)^n} \right]$$

In case of annuity due

$$PVA_{n(due)} = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right](1+k) \quad (2.12)$$

where PVA_n = Present value of an annuity which has a duration of n periods

A = Constant periodic flows

k = discount rate

Capital Recovery Factor

Equation 2.12 shows the relationship between PVA_n, A, K and n. Manipulating it a bit:

We get

$$A = PVA_n\left[\frac{k(1+k)^n}{(1+k)^n - 1}\right] \quad (2.13)$$

$\left[\frac{k(1+k)^n}{(1+k)^n - 1}\right]$ in equation 2.13 is inverse of $PVIFA_{k,n}$ and is called the capital recovery factor.

Example 2.10: Suppose you receive a cash bonus of Rs.1,00,000 which you deposit in a bank which pays 10 percent annual interest. How much can you withdraw annually for a period of 10 years.

From eq.2.13

$$A = PVA_n \times \frac{1}{PVIFA_{10\%}10}$$

$$A = \frac{1,00,000}{6.145}$$

$$A = 16,273$$

Present value of perpetuity:

A perpetuity is an annuity of an infinite duration

$$PVA_\infty = A\left[\frac{1}{(1+k)} + \frac{1}{(1+k)^2} + \ldots + \frac{1}{(1+k)}\infty\right]$$

$$PVA_\infty = A \times PVIFA_{k,\infty}$$

where PVA_∞ = Present value of a perpetuity

A = Constant annual payment

$PVIFA_{k,\infty}$ = Present value interest factor for perpetuity

The value of $PVIFA_{k,\infty}$ is

$$\sum_{t=1}^{\infty} \frac{1}{(1+k)^t} = \frac{1}{k}$$

The present value interest factor of an annuity of infinite duration (perpetuity) is simply 1 divided by interest rate (expressed in decimal form. The present value of an annuity is equal to the constant annual payment divided by the interest rate, for example, the present value of perpetuity of Rs.20, 000 if the interest rate is 10%, is Rs. 2,00,000.

☞ Check Your Progress 2

1) Calculate the present value of Rs. 600 (a) received one year from now (b) received at the end of five years (c) received at the end of fifteen years. Assume a 5% time preference rate.

……

……

……

2) Mr. Ram is borrowing Rs. 50,000 to buy a motorcycle. If he pays equal installments for 25 years and 4% interest on the outstanding balance, what is the amount of installment? What will be amount of the instalment if quarterly payments are requested to be made?

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3) A bank has offered to pay you an annuity of Rs. 1,800 for 10 years if you invest Rs. 12,000 today. What rate of return would you earn?

……

……

……

Derivation of Formulas

i) Future Value of an Annuity

Future value of an annuity is

$$FVA_n = A(1+k)^{n-1} + A(1+k)^{n-2} + ...A(1+k) + A \qquad (a1)$$

Multiplying both sides of the equation a1 by $(1+k)$ gives.

$$(FVA_n)(1+k) = A(1+k)^n + A(1+k)^{n-1} + ...A(1+k)^2 + A(1+k) \qquad (a2)$$

Subtracting eq. (a1) from eq. (a2) yields

$$FVA_n k = A\left[\frac{(1+k)^n - 1}{k}\right] \qquad (a3)$$

Dividing both sides of eq. (a3) by k yields

$$FVA_n = A\left[\frac{(1+k)^n - 1}{k}\right]$$

ii) Present Value of an Annuity

The present value of an annuity is

$$PVA_n k = A(1+k)^{-1} + A(1+k)^{-2} + ...+ A(1+k)^{-n} \qquad (a4)$$

Multiplying both sides of eq (a4) by $(1+k)$ gives:

$$PVA_n(1+k) = A + A(1+k)^{-1} + ...+ A(1+k)^{-n+1} \qquad (a5)$$

Subtracting eq (a4) from eq (a5) yields:

$$PVa_n k = A\left[1 - (1+k)^{-n}\right] = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right] \qquad (a6)$$

Dividing both the sides of eq (a6) by k results in:

$$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$$

iii) **Present Value of a Perpetuity**

$$PVA_\infty = A(1+k)^{-1} + A(1+k)^{-2} + ...+A(1+k)^{\infty+1} + A(1+k)^{\infty} \quad (a7)$$

Multiplying both the sides of eq (a7) by (1+k) gives:

$$PVA_\infty = (1+k) = A(1+k) + A(1+k)^{-1} + ...A(1+k)^{-\infty+2} + A(1+k)^{-\infty+1} \quad (a8)$$

subtracting eq (a7) from eq (a8) gives:

$$PVA_\infty k = A[1-(1+k)^{\infty}]$$

$$As\,(1+k)^{-\infty} \to o\,eq.(a8)\,becomes:$$

$$PVA_\infty k = A$$

$$\Rightarrow PVA_\infty = \frac{A}{k} \quad (a9)$$

iv) **Continuous Compounding**

In Section 2.2.2 we had established a relationship between the effective and nominal rate of interest where compounding occur n times a year which is as follows:

$$r = (1+\frac{k}{m})^m - 1 \quad (a10)$$

Rearranging equation a10, it can be expressed as

$$r = [(1+\frac{k}{m/k})^{m/k}]^k - 1 \quad (a11)$$

Let us substitute m/k by x om eq (a11)

$$r = [(1+\frac{1}{x})^k] - 1 \quad (a12)$$

In continuous compounding $m \to \infty$ which implies $x \to \infty$ in eq (a12)

$$\lim_{x \to \infty}\left(1+\frac{1}{x}\right)^x = e = 2.71828...$$

From equation (a12) results in

$$R = e^k - 1$$

$$\Rightarrow (r+1) = e^k$$

Thus the future value of an amount when continuous compounding is done is as follows:

$$FV_n = PV \times e^{km} \quad (a13)$$

v) **Continuous Discounting**

From eq (a12)

$$PV = FV_n \times e^{-km}$$

2.4 SUMMARY

Individuals generally prefer possession of cash right now or in the present moment rather than the same amount at some time in the future. This time preference is basically due to the following reasons: (a) uncertainty of cash flows (b) preference for current consumption (c) availability of investment opportunities. In case an investor opts to receive cash in future s/he would demand a risk premium over and above the risk free rate as compensation for time to account for the uncertaininty of cash flows. Compounding and discounting are techniques to facilitate the comparison of cash flows occurring at different time periods. In compounding future value of cash flows at a given interest rate at the end of a given period of time are cash flows at a given interest rate at the beginning of a given period of time is found out. An annuity is a series of periodic cash flows of equal amount. Perpetuity is an annuity of infinite duration. *Table 2.1* depicts the various formulas used for discounting and compounding.

Table 2.1: Summary of Discounting and Compounding Formulas

Purpose	Given PV Present Value	Calculate FV_n Future value n years hence	Formula
compound value of a lump sum			$FV_n = PV\,(1+k)^n$
Doubling Period Compound value of a lump sum with shorter compounding period	Interest Rate PV and frequency of compounding (m)	Time Required to double an amount Future value after n year (FV_n)	$0.35 + \frac{69}{\text{Interest Rate}}$ $FV_n = PV\,(1+\frac{k}{m})^{m\times n}$
Relationship between effective and nominal rate	Nominal interest rate (K) and frequency of compounding (m)	Effective interest rate (R)	$r = (1+\frac{k}{m})^m - 1$
Present value of a single amount	Future value (FV_n)	Present Value (PV)	$PV_n = FV_n\,(\frac{1}{1+k})^n$
Future value of a regular annuity	Constant periodic cash flow (A) interest rate (k) and duration (n)	Further value of a regular annuity (FVA_n)	$FVA_n = A[\frac{(1+k)^n - 1}{k}]$
Future value of a annuity due	Constant periodic cash flow (A) interest rate (k) and duration (n)	Future value of an annuity due FVA_n (due)	$FVA_{n(due)} = A[\frac{(1+k)^n - 1}{k}](1+k)$
Present value of a regular annuity	Constant periodic cash flow (A) interest rate (k) and duration (n)	Present value of a regular annuity PVA_n	$PVA_n = A\left[\frac{(1+k)^n - 1}{k(1+k)^n}\right]$
Present value of an annuity due	Constant periodic cash flow (A) interest rate (k) and duration (n)	Present value of an annuity due PVA_n (due)	$PVA_{n(due)} = A[\frac{(1+k)^n - 1}{k(1+k)^n}](1+k)$
Present value of a perpetuity	Constant cash flows (A) and interest rate (k)	Present value of an perpetuity PVA_∞	$PVA_\infty = \frac{A}{K}$

2.5 SELF-ASSESSMENT QUESTIONS

1) If you are offered two investments, one that pays 5% simple interest per year and one that pays 5% compound interest per year, which would you choose? Why?

2) Suppose you make a deposit today in a bank account that pays compounded interest annually. After one, year, the balance in the account has grown.
   a) What has caused it to grow?
   b) After two year's the balance in the account has grown even more what has caused the balance to increase during the second year?

3) The Florida Lottery pays out winnings, after taxes, on the basis of 20 equal annual installments, providing, the first installment at that time when the winning ticket is turned in.
   a) What type of cash flow pattern is the distribution of lottery winnings?
   b) How would you value such winnings?

4) Rent is typically paid at the first of each month. What pattern of cash flow, an ordinary annuity or an annuity due, does a rental agreement follow?

5) a) Under what conditions does the effective annual rate of interest (EAR) differ from the annual percentage rate (APR)?
   b) As the frequency of compounding increases within the annual period what happens to the relation between the EAR and the APR?

6) Using the appropriate table, calculate the compound factor for each of the following combinations of interest rate per period and number of compounding periods:

Number of Periods	Interest rate per Period	Compound Factor
2	2%	-
4	3%	-
3	4%	-
6	8%	-
8	6%	-

7) Using the appropriate table, calculate the discount factor for each of the following combinations of interest rate per period and number of discounting periods.

Number of Periods	Interest Rate per Period	Discount Factor
2	2%	-
4	3%	-
3	4%	-
6	8%	-
8	6%	-

8) Using the appropriate table, calculate the future value annuity factor for each of the following combinations of interest rate per period and number of payments:

Number of Periods	Interest Rate per Period	Discount Factor
2	2%	-
4	3%	-
3	4%	-
6	8%	-
8	6%	-

9) Using the appropriate table, calculate the present value annuity factor for each of the following combinations of interest rate per period and number of payments:

Number of Periods	Interest Rate per Periods	Discount Factor
2	2%	-
4	3%	-
3	4%	-
6	8%	-
8	6%	-

10) Using an 8% compounded interest rate per period calculate the future value of

a) Rs.100 investment
b) one period into the future
c) two periods into the future
d) three periods into the future
e) four periods into the future
f) five periods into the future
g) 40 periods into the future.

11) Suppose you deposit Rs.1,000 into a savings account that earns interest at the rate of 4% compounded annually, what would the balance in the account be:

a) after two years
b) after four years
c) after six years
d) after 20 years

12) You deposit Rs.10,000 in an account that pays 6% compounded interest per period, assuming no withdrawal:

a) What will be the balance in the account after two periods?
b) after the two periods, how much interest has been paid on the principal amount?
c) After the two periods, how much interest has been paid on interest?

13) Using an 8% compounded interest rate, calculate the present value of Rs.100 to be received:

a) one period into the future
b) two periods into the future
c) three periods into the future
d) four periods into the future
e) five periods into the future
f) 40 periods into the future

14) Ted wants to borrow from Fred. Ted is confident that he will have Rs.1, 000 available to pay off Fred in two years. How much will Fred be willing to lend to Ted in return for Rs.1,000 two years from now if he uses a compounded interest rate per year of:
(a) 5% (b) 10% (c) 15%?

15) How much would you have to deposit into a savings account that earns 2% interest compounded quarterly, to have a balance of Rs. 2,000 at the end of four years if you make no withdrawals?

16) What is the present value of Rs.5, 000 to be received five years from now, if the nominal annual interest rate (APR) is 12 % and interest is compounded:
(a) Annually (b) Semiannually (c) Quarterly (d) Monthly

17) Calculate the future value at the end of the second period of this series of end-of period cash flows, using an interest rate of 10% compounded per period:

Year	End of Year Cash Flow
Year 1	Rs. 2,000
Year 2	Rs. 3,000
Year 3	Rs. 4,000
Year 4	Rs. 5,000

18) An investor is considering the purchase of an investment at the end of Year 0 that will yield the following cash flows:

Year	End of Year Cash Flow
Year 1	Rs. 2,000
Year 2	Rs. 3,000
Year 3	Rs. 4,000
Year 4	Rs. 5,000

If the appropriate discount rate for this investment is 10%, what will this investor be willing to pay for this investment.

19) Calculate the present value (that is the value at the end of period 0) of the following series of end of period cash flows:

Year	End of Year Cash Flow
0	Rs.1,000
Year 2	Rs. 200
2	Rs. 400

20) Suppose the investment promises to provide the following cash flows:

Year	End of Year Cash Flow
Year 1	Rs.0
Year 2	Rs.1,000
Year 3	Rs.0
Year 4	Rs.1,000

If interest is compounded annually at 5% what is the value of the investment at the end of: (a) Year 1 (b) Year 0

21) Calculate the future value at the end of the third period of an ordinary annuity consisting of three cash flows of Rs.2,000 each. Use a 5% rate of interest per period.

22) What is the present value of Rs.10 to be received each period forever, if the interest rate is 6%?

23) If an investor is willing to pay Rs.40 today to receive Rs.2 every year forever, what is this investor's opportunity cost used to value this investment?

24) Calculate the present value of an annuity due consisting of three cash flows of Rs.1,000 each, one year apart. Use a 6% compounded interest rate per year.

25) Calculate the future value at the end of the third period of an annuity due, consisting of three cash flows of Rs.1,000 each, each one year apart. Use a 6% compounded interest rate per year.

26) Suppose you have won the Florida Lotto worth Rs.18 million. Further suppose that the State of Florida will pay you the winnings in 20 annual installments,

starting immediately, of Rs.9,00,000 each. If your opportunity cost is 10% what is the value today of these 20 installments?

27) Calculate the required deposit to be made today so that a series of ten withdrawals of Rs.1,000 each can be made beginning five years from today. Assume an interest rate of 5% per period of end of period balances.

28) How much would you need to deposit today so that you can withdraw Rs. 4,000 per year for ten years, starting three years from today?

29) Suppose you wish to invest Rs. 2,000 today so that you have Rs. 4,000 six years from now. What must the compounded annual interest rate be in order to achieve your goal?

2.6 SOLUTIONS/ANSWERS

Check Your Progress 1

1) i) Annual Compounding Rs. 1,254.
   ii) Half year Compounding Rs. 1,262.
   iii) Quarterly Compounding Rs. 1,267.
   iv) Monthly Compounding Rs. 1, 270.

2) Rs. 1,806

3) 7%

Check Your Progress 2

1) a) Rs. 571.20 b) 470.50 c) 288.60

2) Equal yearly instalment = Rs. 3200.61
   Equal quarterly instalment = Rs. 793.28

3) 8.15%

UNIT 3 INVESTMENT APPRAISAL METHODS

Structure **Page Nos.**

3.0 INTRODUCTION

The value of any particular asset is not easy to determine as the value of any asset is determined by the present value of the future cash flows associated with the assets which itself are uncertain in nature. The managers are continually faced with decisions regarding the various alternative investments scenarios. In this unit we look at the various types of capital investment decisions which the finance manager takes we are also going to look at the ways and means to estimate the costs and benefits associated with these decisions.

3.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the nature and importance of capital investment decisions, and
- explain the various evaluation criteria for investment decisions.

3.2 THE INVESTMENT PROBLEM

Firms continually invest funds in assets and these assets produce cash flows and income, which can be either reinvested or paid to the shareholders. These assets represent the firms capital and is the firm's total assets and includes tangible and intangible assets. Capital investment is the firm's investment in its assets. The firm's capital investment decision may be comprised of a number of distinct decisions each referred to as a project. A capital project is a set of assets that are contingent on the other and are considered together. The investment decisions of the firms are decisions concerning a firm's capital investment.

Investment decisions of capital projects are primarily based on two factors:

(i) the changes in the firm's future cash flows by investing in a particular capital project, and

(ii) the uncertainty associated with future cash flows.

The value of a firm is the present value of all its future cash flows and the source of these future cash flows are:

- Assets that are already in place
- Future investment opportunities.

Future cash flows are re-discounted at a rate which takes into consideration the risk and uncertaininty of these cash flows. Cash flow risk comes from two basic sources:

- ***Sales risk***, which is the degree of uncertainty related to the number of units that will be sold and the price realised.

- ***Operating risk***, which is the degree of uncertainty concerning cash flows that arises from the particular mix of fixed and variable operating costs of sales. Risk is associated with general economic conditions prevailing in the markets in which goods and services are sold, whereas the operating risk is determined by the product itself and is related to the sensitivity of operating cash flows to changes in sales. The combination of these two risks is business risks.

The discount rate (the rate of return required to compensate the suppliers of capital) is a function of business risk associated with the project. From the investors perspective the discount rate is the required rate of return (RRR) and from the firm's perspective, the discount rate is the cost of capital.

3.3 CAPITAL INVESTMENT AND FIRM'S VALUE

As, we have already discussed the firm's value is the present value of all the future cash flows. In order to assess whether the capital investments are adding value to the firm we have to look at the future cash flows associated with capital investment and the discount rate which would equate these cash flows to their present values.

Capital Budgeting: Capital budgeting is the process of identifying and selecting investments in the long lived assets or the assets which are expected to produce benefits over more than a year. Business is all about exploring avenues for growth and innovation, which requires continuous evaluation of possible investment opportunities. Capital budgeting to a large extent depends upon the corporate strategy.

3.3.1 Stages in Capital Budgeting Process

There are four stages in the capital budgeting process:

Stage 1: Investment Screening and Selection **–** Projects consistent with the corporate strategy are identified by the various functional units (production, marketing, research and development) of the firm. Once the projects are identified, projects are evaluated and screened by an investment committee comprising of senior managers. The main focus of this process is to estimate how the investment proposal will affect the future cash flows of the firm and hence the value of the firm.

Stage 2: Capital Budgeting Proposal – Once the investment proposal survives the scrutiny of the investment committee, a capital budget is proposed for the project. The capital budget lists the amount of investment required for each investment proposal. This proposal may start with estimates of expected revenue and costs. At a later stage inputs from marketing, purchasing engineering, production and accounting and finance functions are put together.

Stage 3: Budgeting Approval and Authorisation Projects included in the capital budgets are authorised, which allows further fact gathering research and analysis as a result of which the capital budget proposal is refined and put up for approval. The approval allows the expenditure on the project. In some firms the projects are authorised and approved concurrently, where as in others a project is first authorised so that the estimates can be refined. It is then approved. Large expenditures require

formal authorisation and approvals whereas capital expenditures within a certain limit can be approved by the managers themselves.

Stage 4: Project Tracking – Once the project is approved the next step is to execute it. The concerned managers periodically report the progress of the project as well as any variances from the plan. The managers also report about time and cost overruns. This process of reporting is known as project tracking

Classifying Investment Project

Investment projects are classified according to their economic life. The economic life or useful life of an asset is determined by its:

- Physical decoration
- Obsolescence
- The degree of competition in the market for a product.

The economic life of an asset is an estimate of the length of time that the asset would provide benefits to the firm. After its useful life, the revenues generated by the assets decline rapidly and expenses on the assets increase in a disproportionate manner.

Generally an investment requires an immediate commitment of funds (cash outflows) and the benefits are received over a period of time in the form of cash inflows. If cash inflows are limited to current period only these types of investments are known as short term investments. If these benefits are spread over many years, these types of investments are referred to as long term investments and expenditure on these investments is known as capital expenditure.

3.3.2 Importance of Capital Investment Decisions

Investment decisions are vital and crucial for any company and merit special attention because of the following reasons:

- They influence the firm's growth in the long run
- They affect the risk of the firm
- They involve commitment of large amount of funds
- They are irreversible or reversible at substantial loss
- They are among the most difficult decisions to make.

Growth: Investment decisions affect the growth rate of the firm. A firm's decisions to invest in long-term assets will have a bearing on the rate and direction of its future growth. The assumptions on which capital investment decisions are based have to be estimated with a fair degree of precision; otherwise this may lead to the creation of excessive capacity and simultaneous increase in interest and other costs. On the other hand inadequate investments would lead to a loss of market share.

Risk: The risk complexion of the firm may also change with long- term commitment of funds for capital assets. The capital assets are financed by a mix of internal accruals, long-term borrowings and issue of fresh equity. The firms using borrowings to finance capital projects become more risky as the future cash flows associated with the capital projects are uncertain.
Funding: Investment decisions generally require large amount of funds, which make it imperative for the firms to plan their investment programame very carefully and make an advance arrangement for procuring finances internally or externally.

Irreversibility: Most of the capital investments are irreversible or reversible at very significant costs. Once the funds are committed for a capital project it becomes imperative for the firm to complete the project, abandoning it mid way would cause heavy losses to the firm as it is difficult to find a market for such custom made plant and machinery.

Complexity: Investment decisions are among the firm's most difficult decisions. The reasons for the complexity of these decisions are that they involve estimating the future cash flows of an investment, decisions, which in turn are depended on economic, political, social and technological variables.

3.3.3 Types of Investment Decisions

There are many ways of classifying investments, which are briefly described as follows:

(a) **Expansion and Diversification**

Increasing economic activities may lead the company in to adding new capacity to its existing product lines to expand existing operations. For example, most of the steel companies have increased their plant capacity to meet increased steel demand. Some of these companies have installed additional capacity to produce specialised products like cold rolled sheets, flat products etc. These types of expansion are known as related diversification. On the other hand the companies may go for unrelated diversification, which requires investment in new products and a new kind of production activity within the company. For example, Reliance Industries Ltd. (RIL) primarily a textile and petrochemical Company diversified into tele- communication. These types of diversification are known as unrelated diversification. In either case the objective of the investment is to generate additional revenue. Investment in existing or new products is also known as revenue-expansion investments.

(b) **Replacement and Modernisation**

Rapid technological advancements have necessitated the replacement and modernisation of existing plants and machinery. The main objective of replacement is to improve operating efficiency and reduce costs. Cost savings may lead to increased profits but the revenue may remain unchanged. In cases where replacement decisions lead to substantial technological and operational improvements, it may also lead to increase in revenues. Replacement investments are also referred to as cost reduction investment.

(c) **Forward and Backward Integration**

All companies require raw materials for production and the final product manufactured may be used as raw material for another company. When the companies integrate the source of raw material/inputs it is known as backward integration, for example, a cloth weaving company investing in yarn spinning, a petroleum product refining company investing in hydrocarbon exploration. In the same way when the intermediate product manufactured is further processed to make another product having a higher value it is known as forward integration, for example, a petroleum product refining company investing in manufacturing petrochemicals. The basic objective of forward and backward integration is to be present at every stage of the value chain.

Another way to classify investments is as follows:

(a) **Mutually Exclusive Investments**

These types of investment decisions involve choosing among different alternatives. Choosing one alternative will exclude all other alternatives. For example, for capital power generation a company may either choose between a gas based or coal based power generator. Choosing any one of the alternatives will automatically exclude all the other available alternatives.

(b) **Independent Investments**

In these type of investment decisions, the choosing of one of the capital investment will not affect the decision making process for other investments. For example, in a cement manufacturing plant, the installation of a rotatory klin and a captive power plant are independent decisions and decision regarding one alternative will not affect the other decision.

(b) **Contingent Investments**

In these types of investments, the decision regarding one project is dependent on the decision regarding another project. For example, a steel company contemplating investments in a blast furnace. The decision regarding this project would be contingent upon the investment in iron ore mines.

3.4 INVESTMENT EVALUATION CRITERIA

The investment evaluation process consist of three steps, which are as follows:

- Estimation of cash flows.
- Estimation of the required rate of return (the opportunity cost of capital).
- Application of a decision rule for making the choice.

Investment Decision Rule

For evaluating a capital investment proposal certain factors needs to be taken into consideration. Any capital budgeting technique should take into consideration the following factors:

1) It should consider all cash flows associated with the project.
2) It should provide for clear and unambiguous way of separating good projects from the bad ones.
3) It should help in ranking projects according to their profitability.
4) It should recognise the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferable to later ones.

Evaluation Criteria

A number of investment criteria (Capital Budgeting Techniques) are used in practice. They may be grouped under the following two categories:

1) Non Discounted Cash Flow Criteria
   - Pay Back Period (PB)
   - Accounting Rate of Return (ARR).

2) Discounted Cash Flows (DCF) Criteria
   - Net Present Value (NPV)
   - Internal Rate of Return (IRR)
   - Profitability Index (PI).

Cash Flow from Investments

A firm invests only to increase the value of their ownership interest. A firm will have cash flows in the future from its past investment decisions. When it invests in new assets, it expects the future cash flows to be greater than without the new investment.

Incremental Cash Flows

The difference between the cash flows of the firm with the investment project and the cash flow of the firm without the investment project both over the same period of time-is referred to as the projects incremental cash flows.

A more useful way of evaluating the change in value of the firm is the break down of the project's cash flow into two components:

1) The present value of the cash flows from the projects operating activities (revenue minus operating expenses), referred to as the project's operating cash flow (OCF); and

2) The present value of the investment cash flows which are the cash flow associated with the expenditure needed to acquire the projects asset and any cash flow associated with the disposal of the asset.

The present value of a project's operating cash flow are generally positive and the present value of the investment cash flows is typically negative.

Investment Cash Flows

When we consider the cash flows of an investment we must also consider all the cash flows associated with acquiring and disposing of assets in the investment.

Asset Acquisition

In acquiring any asset there are three types of cash flow to consider:

1) Cost of the asset
2) Set up expenditures, including shipping and installation
3) Any tax credit.

In addition to these factors two other factors viz., sunk cost and the opportunity cost should be factored in the analysis of new projects.

Sunk cost is any cost that has already been incurred that does not affect future cash flows of the firm, e.g., Research and Development cost of new products.

In case the new project uses already existing assets (generating cash flows) the cash flows foregone to use the above said assets represents the opportunity cost that must be included in the analysis of the new project. However, these foregone cash flows are not asset acquisition cash flows, but they represent operating cash flows that could have occurred but will not because of the new project, they must be considered part of the project's future operating cash flows.

Asset Disposal

At the end of the useful life of an asset the firm may be able to sell it or pay someone to diamantal and haul it away. If a firm is making replacement decision the cash flow from disposal of the asset must be factored in since this cash flow is relevant to the acquisition of the new assets. For the disposal of an existing asset whether at the end of the useful life or when it is replaced, two types of cash flows must be considered:

1) The firm receives or pays in disposing off the asset
2) The tax consequences resulting from the disposal.

Cash flow from disposing assets = proceeds or payments from disposal of assets – Taxes from disposing assets.

The tax on disposal would depend upon three factors:

1) The expected sales price.
2) The book value of the asset for tax purpose. The book value of an asset is (Original cost of acquisition – Accumulated depreciation). The book value is also referred to written Down Value (WDV).
3) The tax rate at the time of disposal.

If a firm sells the asset for more than its book value but for less uses than its original cost, the difference between the sales price and the book value for taxable purposes (called the tax basis) is a gain taxable at ordinary tax rates. If the firm sells the asset for more than its original cost than the gain is broken into two parts:

1) **Capital Gain:** The difference between the sales price and original cost.
2) **Recapture of Depreciation:** The difference between the original cost and the written down value.

The capital gains are taxed at special rates usually lower than the ordinary rates. The recapture of depreciation is taxed at the ordinary rate. If a firm sells off asset for less than its book value, the result is capital loss. The capital loss can be offset against capital gains.

Operating Cash Flows

In the simplest form of investment there is a cash outflow when assets are acquired and there may be either cash outflow or inflow during the economic life of the asset. The investment in assets or undertaking new projects results in change in revenue, expenditure, taxes and working capital. These are operating cash flows which result directly from the operating activities.

The operating cash flows cannot be predicted accurately for the future but an effort must be made to estimate the input for future planning. These estimates depend upon research, engineering analysis, operation research, competitor's analyses and managerial experience.

Estimating Cash flows

Non Discounted Cash Flow Criteria

Capital budgeting decisions are based on future information relating to costs and benefits associated with all the proposals being considered, besides the required rate of return which measures profitability. Therefore, the following data or information is required before using any technique of capital budgeting.

Cash Flows

In capital budgeting decisions, the costs and benefits of a proposal are measured in terms of cash flows. Clash flows refer to cash revenue minus cash expenses or cash oriented measures of return generated by a proposal. The costs are denoted as cash outflows whereas the benefits are denoted as cash inflows. The cash flows associated with a proposal, usually, involves the following three types of cash flows:

- Initial Investment or Cash Outflows
- Net Annual Cash Inflows
- Terminal Cash Inflows.

Initial Investment or Cash Outflows

In case of new projects, the initial investment is an outlay of total cash outflows that takes place in the initial period (zero time period) when an asset is purchased. It comprises:

- ***Cost of New Asset*** to purchase land, building, machinery etc. including expenses on insurance, freight, loading and unloading, installation cost etc.

- ***Opportunity Cost***, if the new investment makes use of some existing facilities for example, if a firm proposes to invest in a machine to be installed on some surplus land of the firm, the opportunity cost of this land would be its selling price.

- ***Additional Working Capital*** i.e., excess of current assets over current liabilities required to extend additional credit, to carry additional inventory, and to enlarge its cash balances.

In cash of **replacement projects,** while determining the amount of initial investment in the new asset in place of an old asset, the scrap or salvage value of the old asset is deducted from the cost and installation charges of the new asset.

The computation of cash outflows has been shown in the following *Table*:

Computation of Initial Investment

	Rs.
Purchase Price of the Asset (including duties and taxes, if any)	…….
Add : Insurance, Freight and Installations costs	…….
Add : Net Opportunity Cost (if any)	…….
Add : Net increase in working capital required	…….
	…….
Less : Cash Inflows in the form of scrap of salvage value of the old assets (in case of replacement decisions)	…….
Initial Investment or Cash Outlay	…….

Net Annual Cash Inflows or Operating Cash Flows

The initial investment or cash outflows are expected to generate a series of cash inflows in the form of cash profits by the project. These cash inflows may be the same every year throughout the life of the project or may vary from one year to another. These annual cash inflows are not accounting profits, because accounting profits are affected by accruals, provisions for future losses and non-cash transactions such as depreciation, preliminary expenses etc. Therefore, cash inflows that are related to capital budgeting decisions are the after tax cash inflows. In other words, net annual cash inflow refers to the annual net income (profits) before depreciation and after tax. For the calculation of these cash inflows, first of all income before tax is calculated by deducting all cash operating expenses and depreciation from the sales revenues. After deducting the tax, the amount of depreciation is added to the income after tax. The balance is the net cash inflows from the project which can also be calculated as follows:

$$NCF = Sales - EXP - DEP - TAX + DEP$$
$$Or \ = EBT - TAX + DEP$$

The amount of net annual cash inflows may also be determined by preparing a profitability statement in the following way:

(1) Profitability Statement (in revenue increasing decisions):

	Rs.
Annual Sales Revenue	……..
Less : Operating Expenses including depreciation	……..
Income before tax	…….
Less: Income Tax	…….
Net Income after tax	……..
Add : Depreciation	……..
Net Cash Inflows	……

(2) Profitability Statement (in cost reduction decision):

	Rs.
(A) Estimated Saving	
Estimated Savings in direct wages	…….
Estimated Savings in Scrap	…….
Total Savings (A)	…….
(B) Estimated Additional Costs	
Additional cost of maintenance	……..
Additional cost of supervision	……..
Add: Cost of indirect material	……..
Additional depreciation	……..
Total Additional Costs (B)	……..
Net Savings before tax (A–B)	……..
Less : Income Tax	……..
Net Savings after tax	……..
Add: Additional depreciation	……..
Net Savings after tax or Cash Inflows	.
	……..

(3) Terminal Cash Inflows

The cash inflows for the last or terminal year of the project will also include the terminal cash inflows in addition to annual cash inflows. The terminal cash inflows i.e., cash inflows to the firm in the last (terminal) year may occur in two ways:

(i) The estimated salvage or scrap value of the project realisable at the end of the economic life of the project or at the time of its termination,

(ii) The working capital which was invested in the beginning will no longer be required as the project is being terminated. This working capital released will be available back to the firm.

Payback Period Method

In the Payback period method the payback period is usually expressed in years, the time in which the cash outflows equal cash inflows. This method is focused on liquidity and profitability. This method recognises the original capital invested in a project. The basic element of this method is calculation of recovery time, by accumulation of the cash inflow (including depreciation) year by year until the cash inflows equal the amount of original investment. In simple terms it may be defined as the number of years required to recover the cost of investments.

$$\text{Payback period} = \frac{\text{Initial Investments}}{\text{Annual Cashflows}} = \frac{Co}{C}$$

Example 3.1:

Initial Investment Year	Project X (1,00,000)		Project Y (1,00,000)	
	Cash inflows to date	Total cash inflows	Cash inflows to date	Total cash inflows
1	20000	20000	25000	25000
2	20000	40000	25000	50000
3	30000	70000	50000	100000
4	30000	100000	20000	120000
5	50000	150000	10000	130000

Solution:
In this example project Y would be selected as its payback period of three years is shorter than the four years payback period of Project X.

Bail out Factor

In the above discussion we have skipped the probability of scrapping the project before the payback period. The salvage value of the project has to be taken into consideration. The bailout payback time is reached when the cumulative cash receipts plus the salvage value at the end of a particular year equals the initial investment.

Example 3.2: Project A costs Rs. 200000 and Project B Costs Rs. 3000000 both have a ten-year life. Uniform cash receipts expected are A Rs. 40,000 p.a. and B Rs. 80,000 p.a. Calculate the payback period.

Solution:

Under traditional payback

$$\text{Project A} = \frac{\text{Rs.}2{,}00{,}000}{\text{Rs.}40{,}000} = 5 \text{ years}$$

$$\text{Project B} = \frac{\text{Rs.}3{,}00{,}000}{\text{Rs.}80{,}000} = 3.75 \text{ years}$$

Merits of Payback Method

(a) It is simple and easy to understand and apply.
(b) This method is useful in case of capital rationing and in situations where there is high amount of uncertainity.
(c) Assuming regarding future interest rates are not changing.
(d) Firms facing liquidity constraints can use this technique to rank projects according to their ability to repay quickly.

Demerits of Payback Method

(a) This method does not take into consideration the time value of money.
(b) This method ignores cash generation beyond payback period.
(c) This method does not indicate whether an investment should be accepted or rejected.
(d) This method is biased against those investments which yield return after a long period.

Payback Period Reciprocal

An alternative way of expressing payback period is "payback period reciprocal" which is expressed as

$$\frac{1}{\text{Payback Period}} \times 100$$

Thus, if a project has a payback period of 5 years then the payback period reciprocal would be

$$\frac{1}{5} \times 100 = 20\%$$

Accounting Rate of Return Method (ARR)

The Accounting Rate of Return uses the accounting information as revealed by financial statements, to measure the profitability of an investment. The accounting rate of return is the ratio of average after tax profit divided by average investment.

$$\text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}}$$

$$\frac{\sum_{t=1}^{n} \text{EBIT}(1 - T)/n}{(I_0 + I_n)/2}$$

Here average income is adjusted for interest. Of the various accounting rate of return, the highest rate of return is taken to be the best investment proposal. In case the accounting rate of return is less than the cost of capital or the prevailing interest rate than that particular investment proposal is rejected.

Example 3.3: A project with a capital expenditure of Rs. 5,00,000 is expected to produce the following profits (after deducting depreciation).

Year	Rs.
1	40,000
2	80,000
3	90,000
4	30,000

Solution :

$$\text{Average annual profits} = \frac{40,000 + 80,000 + 90,000 + 30,000}{4} = \text{Rs.}60,000$$

Average investment assuming no scrap value is the average of the investment at the beginning and the investment at the end.

$$\text{i.e., } \frac{\text{Rs.}5,00,000 + 0}{2} = \text{Rs.}2,50,000$$

Note: If the residual value is not zero but say Rs. 60,000 then the average investment would be,

$$\frac{\text{Rs. } 5,00,000 + \text{Rs.}60,000}{2} = \text{Rs. } 2,80,000$$

The accounting rates of return = $\frac{\text{Rs.}60,000}{\text{Rs.}2,50,000} \times 100 = 24\%$

This percentage is compared with those of other projects in order that the investment yielding the highest rate of return can be selected.

Example 3.4: Consider the following investment opportunity:

A machine is available for purchase at a cost of Rs. 80,000.

We expect it to have a life of five years and to have a scrap value of Rs. 10,000 at the end of the five-year period. We have estimated that it will generate additional profits over its life as follows:

Year	Rs.
1	20,000
2	40,000
3	30,000
4	15,000
5	5,000

These estimates are of profits before depreciation. You are required to calculate the return on capital employed.

Solution:

Total profit before deprecation over the life of the machine = Rs. 1,10,000

Average profit p. a. $= \frac{\text{Rs. } 1,10,000}{5 \text{ years}} = \text{Rs. } 22,000$

Total depreciation over the life of the machine = Rs. 80,000 – Rs. 10,000 = Rs 70,000

Average depreciation p.a. $= \frac{\text{Rs.}70,000}{5 \text{ years}} = \text{Rs.}14,000$

Average annual profit after depreciation = Rs. 22,000 – Rs. 14,000 = Rs. 8,000

Original investment required = Rs. 80,000

Accounting rate of return = $\frac{\text{Rs.}8,000}{80,000} \times 100 = 10\%$

Return on average investment:

Average investment = $\frac{80,000 + 10,000}{2} = \text{Rs.}45,000$

Therefore, accounting rate of return = $\frac{8,000}{45,000} \times 100 = 17.78\%$

Merits of ARR

- It is easy to calculate
- It is not based on cash flows but on profits
- It takes into consideration all the years involved in the life of the project.

Demerits of ARR

- It does not take into consideration time value of money
- Change in depreciation policy may bring inconsistency in results
- This method fails to distinguish the size of the investment
- It is biased against short term projects
- Acceptance and rejection decisions are based on subjective management targets.

☞ Check Your Progress 1

1) A factory engaged in the manufacture of electronic goods has a ten-year old equipment depreciated on straight-line method. The useful life of the equipment was estimated to be 20 years with residual value of Rs.3 Lakhs (original cost of the equipment being Rs. 23 Lakhs). The output of the equipment is 1200 units per hour.

The management now proposes to install new equipment worth Rs. 50 Lakhs which has an estimated life of 15 years and a residual value of Rs. 5 Lakhs. The payment terms for the new equipment include a part exchange provision of Rs. 6 Lakhs in respect of the existing equipment. The output of the new equipment is 3,000 units per hours.

Particulars	Existing Equipment (Rs.)	New Equipment (Rs.)
Wages	1,00,000	1,20,000
Repair and Maintenance	20,000	52,000
Consumables	3,20,000	4,80,000
Power	1,20,000	1,50,000
Allocation of Fixed Costs	60,000	80,000
Total hours run per year	2,400	2,400

You are required to prepare a comparative schedule showing total conversion cost as well as cost per 1000 units after considering interest @ 10% on net cash outflow for procuring the new equipment and also for providing for the yearly recovery of the loss suffered in the transaction.

2) T.Ltd. has specialised in the manufacture of a particular type of transistor. Recently, it has developed a new model and is confident of selling all the 8,000 units (new product) that would be manufactured in a year. The required capital equipment would cost Rs. 25 Lakhs and that would have an economic life of 4 years with no significant salvage value at the end of such a period. During the first four years, the promotional expenses would be as planned below: -

Year	1	2	3	4
Expenses (Rs.)				
Advertisement	1,00,000	75,000	60,000	30,000
Others	50,000	75,000	90,000	1,20,000

Variable costs of producing and selling a unit would be Rs. 250. Additional fixed operating costs to be incurred because of this new products is budgeted at Rs. 75,000 per year. The management expects a discounted return of 15%

(after tax) on investment in the new product. You are required to work out an initial selling price per unit of the new product that may be fixed with a view to obtaining the desired return on investment. Assume a tax rate of 40% and use of straight-line method of depreciation for tax purpose.

Note: The present value of annuity of Rs. 1 received or paid in a steady stream throughout the period of four years in the future at 15 % is 3.0078.

3) A company proposes to undertake one of the two mutually exclusive projects namely, AXE and BXE. The initial outlay and annual cash inflows are as under:

Particular	AXE	BXE
Initial Capital outlay (Rs.)	22,50,000	30,00,000
Salvage Value at the end of the life	0	0
Economic life (years)	4	7

Particulars		AXE	BXE
	Year	Rs. Lakhs	Rs. Lakhs
After tax annual cash inflows	1	6.00	5.00
	2	12.50	7.50
	3	10.00	7.50
	4	7.50	12.50
	5	-	12.50
	6	-	10.00
	7	-	8.00

The company's cost of capital is 16%.

Required: (i) Calculate for each project (a) Net present value of Cash flows (b) Internal rate of return (ii) Recommend with reasons, which of the two projects should be undertaken by the Company.

Present value of Re. 1

Year	16%	19%	20%	21%	22%	23%
1	.862	.840	.833	.826	.820	.813
2	.743	.706	.694	.683	.672	.661
3	.641	.593	.579	.564	.551	.537
4	.532	.499	.482	.467	.451	.437
5	.476	.419	.402	.386	.370	.355
6	.410	.352	.335	.319	.303	.289
7	.354	.296	.279	.263	.249	.235
8	.305	.249	.233	.218	.204	.191

Discounted Cash Flow (DCF) Techniques

1) Net Present Value (NPV) Method

In this method all cash flows attributable to a capital investment project are discounted by a chosen percentage e.g., the firms weighted average cost of capital to obtain the present value of the future cash flows. If the present value of the future cash flows is higher than the present value of the investments the proposal is accepted else rejected. In order to arrive at the net present value the present value of the future cash flows is deducted from the initial investment.

$$NPV = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \ldots \frac{C_n}{(1+k)^n} - C_0$$

$$NPV = \sum_{t=1}^{n} \frac{C_n}{(1+k)^t} - C_0$$

Where C_0 = initial investment (cash outflows)
C_t = Cash flows occurring at time t
K= discount rate

Example 3.5: A firm can invest Rs. 10,000 in a project with a life of three years.

Year	Rs.
1	4,000
2	5,000
3	4,000

The cost of capital is 10% p.a should the investment be made?

Solution:
Firstly the discount factors can be calculated based on Rs. 1 received in with r rate of interest in 3 year

$$\frac{1}{(1+r)^n}$$

Year 1	$= \frac{Re.1}{(1.10/100)}$	$= \frac{Re.1}{(1.10)}$	= 0.909
Year 2	$= \frac{Re.1}{(1+10/100)^2}$	$= \frac{Re.1}{(1.10)^2}$	= 0.826
Year 3	$= \frac{Re.1}{(1+10/100)^3}$	$= \frac{Re.1}{(1.10)^3}$	= 0.751

In this chapter, the tables given at the end of the block are used wherever possible. Obviously, where a particular year or rate of interest is not given in the tables it will be necessary to resort to the basic discounting formula.

Year	Cash flow Rs.	Discount factor	Present value Rs.
0	10,000	1,000	10,000
1	4,000	0.909	636
2	5,000	0.826	4130
3	4,000	0.751	3.4
			NPV = 770

Since the net present value is positive, investment in the project can be made.
Example 3.6: Machine A costs Rs. 1,00,000 payable immediately. Machine B costs Rs. 1,20,000 half payable immediately and half payable in one year's time. The cash receipts expected are as follows:

Year (at the end)	A	B
1	20,000	
2	60,000	60,000
3	40,000	60,000
4	30,000	80,000
5	20,000	

With 7% interest which machine should be selected?

Solution:
Machine A

Year	Cash flow Rs.	DF@ 7%	PV Rs.
0	1,00,000	1,00000	1,00,000
1	20,000	0.93458	18692
2	60,000	0.87344	52,406
3	40,000	0.81630	32652
4	30,000	0.76289	22887
5	20,000	0.71299	14,260
			NPV = 40,897

Machine B

Year	Cash Flow Rs	DF@ 7%	PV Rs.
0	60,000	1,00000	60000
1	60,000	0.93458	56075
2	60,000	0.857344	52406
3	60,000	0.81630	48978
4	80,000	0.76289	61.031
			NPV = 46340

Since Machine B has the higher NPV, our decision should be to select Machine B.

Merits of NPV Method:

- It recognise the time value of money
- It considers the total benefits arising out of the proposal over its lifetime.
- This method is particularly useful for selection of mutually exclusive projects

Demerits of NPV Method:

- It is difficult to calculate as well as understand.
- Calculating the discount rate is complicated.
- This method is an absolute measure. When two projects are considered this method will favour the project with the higher NPV.
- If two projects with different life spans are evaluated using this method, this method may not yield satisfactory result.

2) Internal Rate of Return (IRR) Method

Internal rate of return is a percentage discount rate used in capital investment appraisals which makes the present value of the cost of the project equal to the future cash flows of the project. It is the rate of return which equates the present value of anticipated net cash flows with the initial outlay. The IRR is also defined as the rate at which the net present value is Zero. The test of profitability of a project is the relationship between the internal rate of return (%) of the project and the minimum acceptable rate of return. The IRR can be determined by solving the following equation for r:

$$C_0 = \frac{C_{1=}}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+k)^3} + \ldots \frac{C_n}{(1+r)^n}$$

$$C_0 = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t} - C_0 = 0$$

The IRR equation is the same as the one used for the NPV method. The only difference is that in the NPV method, the required rate of return k is known while in the IRR method the value of r has to be determined at which the net present value becomes zero.

A project is accepted if the internal rate of return is higher than the cost of capital.

Example 3.7: A company has to select one of the following two projects:

	Project A	Project B
Cost	11000	10000
Cash inflows		
Year 1	6000	1000
2	2000	1000
3	1000	2000
4	5000	10000

Using the internal rate of return method suggest which project is preferable.

Solution:

The cash inflow is not uniform and hence the internal rate of return will have to be calculated by the trial and error method. In order to have an approximate idea about such a rate, it will be better to find out the Factor. The factor reflects the same relationship of investment and cash inflows in case of payback calculation:

F	I/C
Where F	Factor to be located
I	Original investment
C	Average cash inflow per year
The factor in case of Project A would be:	The factor in case of Project B would be:
$F = \frac{11{,}000}{3{,}500} = 3.14$	$F = \frac{10{,}000}{3{,}500} = 2.86$

The factor thus calculated will be located in the table given at the end of the unit on the line representing number of years corresponding to estimated useful life of the asset.

This would give the expected rate of return to be applied for discounting the cash inflows, the internal rate of return.

In case of Project A, the rate comes to 10% while in case of Project B it comes to 15%.

Project A

Year	Cash inflows	Discounting factor at 10%`	Present value Rs.
1	6,000	0.909	5454

2	2,000	0.826	1652
3	1,000	0.751	751
4	5,000	0.683	3415
Total present value			

The present value at 10% comes to Rs. 11,272. The initial investment is Rs. 11,000. Internal rate of return may be taken approximately at 10%.

In case more exactness is required another trial rate which is slightly higher than 10% (since at this rate the present value is more than initial investment may be taken) Taking a rate of 12%, the following results would emerge:

Year	Cash inflows Rs.	Discounting factor at 12%	Present value Rs.
1	6,000	0.893	5358
2	2,000	0.797	1594
3	1,000	0.712	712
4	5,000	0.636	3180
Total present			10,844

The internal rate of return is thus more than 10% but less than 12%. The exact rate may be calculated as follows. Difference calculated in present

P.V. required	Rs. 11,000	
P.V. at 10%	Rs. 11,272	(+) Rs. 272
P.V. at 12%	Rs. 10,844	(–) Rs. 156

Actual IRR = $10+\frac{272}{272+156}\times 2 \quad = 11.27\%$

Project B

Year	Cash inflows Rs.	Discounting factor At 15%	Present Value Rs.
1	1,000	0.870	870
2	1,000	0.756	756
3	2,000	0.658	1316
4	10,000	0.572	5720
Total present value			8662

Since present value at 15% adds up to Rs. 8,662, a lower rate of discount should be taken. Taking a rate of 10% the following will be the result.

Year	Cash inflows Rs.	Discounting factor At 10%	Present Value Rs.
1	1000	0.909	909
2	1000	0.826	826
3	2000	0.751	1502
4	10000	0.683	6830
Total present value			10067

The present value at 10% cumulates Rs. 10067 which is more or less equal to the initial investment. Hence the internal rate of return may be taken as 10%
In order to have more exactness to internal rate of return can be interpolated as done in case of Project A.

P.V. required	Rs. 10,000	

P.V. at 10%	Rs. 10067	(+) Rs. 67
P.V. at 15%	Rs. 8,662	(–) Rs. 1,338
Actual IRR	$10+\frac{67}{67+1338}\times 5$	10.24%

Thus, internal rate of return in case of Project A is higher as compared to Project B. Hence, Project A is preferable.

Example 3.8: The project cash flows from two mutually exclusive Projects A and B are as under:

Period	Project A	Project B
0 (outflow)	Rs. 22,000	Rs. 27,000
1 to 4 (inflow)	Rs. 6,000 cash year	Rs. 7,000 each year
Project life	Years	7 years

- Advice on project selection with reference to internal rate of return
- Will it make any difference in project selection, if the cash flow from Project B is for 8 years instead of 7 year @ Rs. 7,000 each year?

Relevant P.V. factors at	For 7 years	For 8 years
15%	4.16	4.49
16%	4.04	4.34
17%	3.92	4.21
18%	3.81	4.08
19%	3.1	3.95
20%	3.60	3.84

Solution:

(i) Project selection based on internal rate of return.

The present values of Project A and Project B is calculated as follows:

Discount Rate	P.V. Factor for 7 yrs.	Project A		Project B	
		Cash inflow p.a (Rs.)	P.V (Rs.)		
15%	4.16	6000	24960	7000	29120
16%	4.04	6000	24240	7000	28280
17%	3.92	6000	23520	7000	27440
18%	3.81	6000	22,860	7000	26670
19%	3.71	6000	22260	70000	25970
20%	3.60	6000	216000	7000	25200

Project A

Since the original investment in Project A is Rs. 22,000 its IRR will fall between 19% and 20%.

	Rs.
P.V. of cash inflows at 19%	22,260
P.V. of cash inflows at 20%	21,600
Difference	660

Now, IRR of Project A is calculated as follows, by applying the formula for interpretation:

$$\text{IRR} = 19 + \frac{22{,}260 - 22{,}000}{660} \times 1 \quad = 19.4\% \text{ (approx)}$$

Project B

Since the original investment in project B is Rs. 27,000, its IRR will fall between 17% to 18%.

	Rs.
P.V. of cash inflows at 17%	27,440
P.V. of cash inflows at 18%	26,670
Difference	770

Now, the IRR of Project B is ascertained as follows:

$$\text{IRR} = 17 + \frac{27{,}440 - 27{,}000}{770} \times 1 \quad = 17.6\% \text{ (approximately)}$$

Selection of Project:

The IRR of Project A and Project B are 19.4% and 17.6% respectively. A project can be selected because of its higher IRR over the other Projects. Hence Project A is to be preferred as it has a higher IRR of 19.4%.

(i) Calculation of IRR of Project B whose cash flow from the Project is for 8 years instead of 7 years

Discount factor	P.V. factor for 8 years Rs.	Cash inflow each year Rs.	P.V. of cash inflows
15%	4.49	7,000	31,430
16%	4.34	000	30380
17%	4.21	7,000	29470
18%	4.08	7000	28,560
19%	3.95	7,000	27,650
20%	3.84	7,000	26,880

Since, the original investment in Project B is Rs. 27, 000, its IRR will fall between 19% to 210%.

	Rs.
P.V. of cash inflows at 19%	27650
P.V. of cash inflows @ 20%	26880
Difference	770

Now, IRR of Project B is calculated as follows:

$$\text{IRR } 19 + \frac{27{,}650 - 27{,}000}{770} \times 1 \quad = 19.8\% \ (\textit{approximately})$$

Selection of Project:

With the change in cash inflow of Project B from, 7 years to 8 years, its IRR is also improved from 17.6% to 19.8% and it is also higher than the IRB of Project A (i.e., 19.4%). Hence, Project B can be selected (based on its 8 years of cash inflows).

Example 3.9: Two investment projects are being considered with the following cash flow projections:

	Project 1	Project 2
Initial outlay		
Cash inflows		
Year 1	10	120
Year 2	30	90
Year 3	210	50
Year 4	50	10

Required:

(a) Prepare on a single graph present value profiles for each project. Use interest rates from 0% to 20% at 5% intervals.
(b) Using the graph paper determine the IRR for each of the projects
(c) State for which range of costs of capital Project 1 would be preferred to Project 2.

Solution:

Workgroups

Year	Undiscou -nted cash flow	Discounted at 5 %		Discounted at 10%		Discounted at 15%		Discounted at 20 %	
	Rs. 000	Discount factor	Cash Flow Rs. 000	Discount factor	Cash Flow Rs. 000	Discount factor	Cash Flow Rs. 000	Discount Factor	Cash Flow Rs. 000
Project 1									
0	(200)	1.000	(200)	1.000	(200)	1.000	(200)	1.000	(200)
1	10	0.952	9.5	0.909	9.1	0.870	8.7	0.833	8.3
2	30	0.907	27.2	0.826	24.8	0.756	22.7	0.694	20.8
3	210	0.864	181.4	0.751	157.7	0.657	138.0	0.579	121.6
4	50	0.823	41.2	0.683	34.2	0.572	28.6	0.482	24.1
5	100		59.3		25.8		2.0		25.2
Project 2									
0	200	1.000	200	1.000	200	1.000	200	1.000	200
1	120	0.952	114.2	0.909	109.1	0.870	104.4	0.833	100.0
2	90	0.907	87.6	0.826	74.3	0.756	68.0	0.694	62.5
3	50	0.864	43.2	0.51	37.6	0.657	32.9	0.579	29.0
4	10	0.823	8.2	0.683	6.8	0.572	5.7	0.482	4.8
	70		47.2		27.8		11.0		3.7

(i) IRR Project 1	15% (to nearest %)
(ii) IRR Project 2	19% to nearest %)

If the cost of capital is <9% (rounded) Project 1 would be preferred.

If the cost of capital is > 9% rounded project 2 would be preferred

The later cash inflows from Project 1 are more heavily discounted the higher the rate of interest in comparison with the earlier cash inflows on Project 2.

Merits of IRR Method:

(a) It considers the time value of money
(b) It takes into account total cash inflows and cash outflows.

Demerits of IRR Method:

(a) It involves tedious calculations, based on trial and error method
(b) It produces multiple rates which can be confusing
(c) Assessment of cash flows can't be estimated accurately
(d) Single discount rate ignores varying future interest rates.

3. Profitability Index (PI) Method

Another time adjusted method of evaluating the investment proposals is the Benefit Cost (B/C) ratio or Profitability Index (PI). Profitability Index is the ratio of the present value of cash inflows at the required rate of return, to the initial cash outflow of the investment. The formula for calculating benefit cost ratio or profitability index is as follows:

$$PI = \frac{\text{PV of cash inflows}}{\text{Initial cash outlay}} = \frac{PV(C_t)}{C_0} = \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} \div C_0$$

A project may be accepted if it's PI is greater than one.

Example 3.10: The following mutually exclusive projects can be considered**:**

Rs.

Particulars	Project A	Project B
1. P.V of cash inflows	20,000	8,000
2. Initial cash outlay	15,000	5,000
3. Net present value	5,000	3,000
4. Profitability index 1/2	1.33	1.60

Solution:

Accordingly to the NPV Method, Project A would be preferred, whereas accordingly to Profitability Index Project B would be preferred.

Although PI method is based on NPV, it is a better evaluation technique than NPV in a situation of capital rationing. For example, two projects may have the same NPV of Rs. 10,000 but Project A requires initial outlay of Rs, 1,00,000 where as B only Rs. 50,000. Project B would be preferred as per the yardstick of the PI method.

Example 3.11:

Original outlay Rs 8,000
Life of the project 3 years
Cash inflows Rs. 4,000 p.a for 3 years
Cost of capital 10% p.a
Expected interest rates at which the cash inflows will be re-invested:

Year end	%
1	8
2	8
3	8

Solution:

First of all, it is necessary to calculate of the total compounded sum which will be discounted to the present value.

Year	Cash inflow Rs.	Rate of Interest %	Years for investment	Compounding factor	Total compounding sum (Rs)
1	4,000	8	2	1.166	4,664
2	4,000	8	1	1.080	4,320
3	4,000	8	0	1.000	4,000
					12,984

Now, we have to calculate the present value of Rs. 12,984 by applying the discount rate of 10%

$$\text{Present Value} = \frac{\text{Compounded value of cash inflow}}{(1+i)^n}$$

$$= \frac{12,984}{(1.10)^3} = \text{Rs.}9,755 = 12984 \times 0.7513 = \text{Rs},9,755$$

(0.7513 being the p.v of Re. 1 received after 3 years).

Here, since the present value of reinvested cash flows i.e Rs. 9,755 is greater than the original cash outlay of Rs. 8,000, the project would be accepted under the terminal value criterion.

Example 3.12: XYZ Ltd. is implementing a project with a initial capital outlay of Rs. 7,600. Its cash inflows are as follows:

Year	Rs.
1	6,000
2	2,000
3	1,000
4	5,000

The expected rate of return on the capital invested is 12% p.a calculate the discounted payback period of the project.

Solution:

Computation of present value of cash flows.

Year	Cash inflow Rs.	Discounted factor @ 12%	Present Value Rs.
1.	6,000	0.893	5,358
2	2,000	0.797	1,594

3	1,000	0.712	712
4	5,000	0.636	3,180
		Total P.V	10,844

The discounted payback period of the project is 3 years i.e., the discounted cash inflows for the first three years (i.e., Rs. 5358 +Rs. 1594 + 712) is equivalent to the initial capital outlay of Rs. 7600.

Example 3.13: A Company is considering a capital investment proposal where two alternatives involving differing degrees of mechanisation are being considered. Both investments would have a five-year life.

In Option 1 new machinery would cost Rs. 2,78,000 and in Option 2 Rs. 8,05,000. Anticipated scrap values after 5 years are Rs. 28,000 and 1,50,000 respectively. Depreciation is provided on a straight-line basis. Option 1 would generate annual cash inflows of Rs. 1,00,000 and Option 2, Rs. 2,50,000. The cost of capital is 15%.

Required:

(a) Calculate for each option:
- (i) the payback period
- (ii) the accounting rate of return, based on average book value
- (iii) the net present value
- (iv) the internal rate of return

(b) Identify the preferred option, giving reasons for your choice.

(a) (i) **Payback period:**

$$\text{Option } 1 = \frac{2,78,000}{1,00,000} = 2.78 \text{ years}$$

$$\text{Option } 2 = \frac{8,05,000}{2,50,000} = 3.32 \text{ years}$$

(ii) **Accounting rate of return:**

Option 1

Annual Depreciation	$\frac{2,78,000 - 28,000}{5}$	50,000
Annual Profit	Rs. 50,000 (1, 00,000 cash flow– 50,000 depreciation)	
Average Investment	$\frac{2,78,000 + 28,000}{2}$	1,53,000
Accounting rate of return	$\frac{50,000}{1,53,000} \times 100\%$	33%

Option 2

Annual depreciation	$\frac{8,05,000-1,50,000}{5}$	Rs. 1,31,000
Annual Profit	Rs. 1,19,000	Rs. 2,50,000 cash flow- Rs. 1,31,000 depreciation
Average investment	$\frac{8,05,000+1,50,000}{2}$	Rs. 4,77,500
Accounting rate of return	$\frac{1,19,000}{4,77,500}\times 100$	25%

(iii) **Net present value (at 15% cost of capital):**

Option 1

Year 0		(2,78,000)
Year 1-5	(1,00,000×3.353)	3,35,300
Year 5	(28,000×0.497)	13,900
	NPV	71,200

Option 2

Approx cumulative discount factor (5 year) = $\frac{7,40,000}{2,50,000}=2.96=20\%$

NPV at 20% **(Rs.)**

Year 0		(8,05,000)
Year 1-5	(2,50,000×3.353)	8,38,300
Year 5	(1,50,000× 0.497)	74,500
	NPV	1,07,800

(iv) **Internal rate of return:**

Option 1

Approx: Commutative discount factor (5 years) = $\frac{2,68,000}{1,00,000}$ = 2.68 = 25%

NPV at 25%

Year 0		(2,78,000)
Year 1-5	(1,00,000x 2.689)	2,68,900
Year 5	(28,000 x 0.328)	9,200
	NPV	100

IRR 25%

Option 2

Approx cumulative discount factor (5 years) $\frac{7,40,000}{2,50,000}$ = 2.96 = 20%

NPV at 20% :

Year 0		(8,05,000)
Year 1-5	(2,50,000 × 2.991)	7,47,700
Year 5	(1,50,000 × 0.402)	60,300
	NPV	3,000

$$\text{IRR} = 15\% + \left(5 \times \frac{1,07,800}{1,04,800}\right) = 20.1\% \qquad \therefore \text{IRR} \quad 20\%$$

Both projects are indicated as being worthwhile when the discounted cash flow returns are compared with the cost of capital. The payback period, accounting rate of return, and internal rate of return calculations all points to option 1 being preferred. The net present value calculation, on the other hand, favours option 2.

The basic reason for the different ranking provided by the NPV method is an absolute money measure which takes into account the scale of the investment as well as the quality. The other three appraisal methods provide measure, which express returns relative to the investment. Investments of comparable relative quality will have the same returns regardless of scale. For example, an annual profit of Rs. 20 on an investment of Rs. 100 will have the same relative return as an annual profit of Rs. 2,00,000 on an investment of Rs. 10,00,000. If one is concerned especially with quality then the relative measures would provide the required ranking. However, if the objective is to maximise wealth, investment worth should be measured by the surplus net present value generated, over and above the cost of the capital.

In the situation in the question the differential between option 1 and option 2 provides an internal rate of return of 18% as follows:

NPV at 18%

Year 0		(5,27,000)
Year 1-5	(1,50,000 × 3.127)	4,69,100
Year 5	(1,22,000 × 0.437)	53,300
	NPV	4,600

The additional investment of Rs. 5,27,000 in option 2 is worthwhile as the IRR of 18 % exceeds the cost of capital.

Finally, it should be recognised that both the payback method and the accounting rate of return method have deficiencies. They do not provide an adequate measure of investment worth. The percentage return including the accounting rate of return calculations is not comparable with the cost of the capital.

The PI method is a conceptually sound method. It takes into consideration the time value of money. It is also consistent with the value maximisation principle. Like NPV and IRR methods the PI method also requires estimations of cash flows and discount rate. In practice, the estimation of discount rates and cash flows is difficult.

☞ Check Your Progress 2

1) Precision Instruments is considering two mutually exclusive Project X and Y: Following details are made available to you.

		Project X	Project Y
Project Cost		700	700
Cash inflows:	Year 1	100	500
	Year 2	200	400
	Year 3	300	200
	Year 4	450	100
	Year 5	600	100
	Total	1,650	1,300

Assume no residual values at the end of the fifth year. The firm's cost of capital is 10% required, in respect of each of the two projects: (i) Net present value, using 10% discounting (ii) Internal rate of return: (iii) Profitability index.

Present Value of Re.1

Year	**10%**	**25%**	**26%**	**2%**	**28%**	**36%**	**37%**	**38%**	**40%**
1	.909	.800	.794	.787	.781	.735	.730	.725	.714
2	.826	.640	.630	.620	.610	.541	.533	.525	.510
3	.751	.512	.500	.488	.477	.398	.389	.381	.364
4	.683	.410	.397	.384	.373	.292	.284	.276	.260
5	.621	.328	.315	.303	.291	.215	.207	.200	.186

2) XYZ Ltd. Has decided to diversity its production and wants to invest its surplus funds on a profitable project. It has under consideration only two projects. "A" and "B". The cost of Project "A" is Rs. 100 Lakhs and that of "B" is Rs. 150 Lakhs. Both projects are expected to have a life of 8 years only and at the end of this period "A" will have a salvage value of Rs 4 Lakhs and "B" Rs. 14 Lakhs. The running expenses of "A" will be Rs. 35 Lakhs per year and that of "B" Rs. 20 Lakhs per year. In both case the company expects a rate of return of 10%. The company tax rate is 50%. Depreciation is charged on a straight-line basis. Which project should the company take up?

Note: Present value of annuity of Re. 1 for eight years at 10% is 5.335 and present value of Re. 1 received at the end of the eight-year is 0.467.

3) National Electronics Ltd. An electronic goods manufacturing company, is producing a large range of electronic goods. It has under consideration two projects "X" and "Y", each costing Rs. 120 Lakhs.

The projects are mutually exclusive and the company is considering the selection of one of the two projects. Cash flows have been worked out for both the projects and the details are given below. "X" has a life of 8 years and "Y" has a life of 6 years. Both will have zero salvage value at the end of their operational lives. The company is already making profits and its tax rate is 50%. The cost of capital of the company is 15%.

At the end of the year	Project "X"	Project "Y"	Preset value of rupee at 15%
	(In Lakhs of rupees)		
1	25	40	0.870
2	35	60	0.756
3	45	80	0.685
4	65	50	0.572
5	65	30	0.497
6	55	20	0.432
7	35	-	0.36
8	15	-	0.327

The company presently follow straight-line method of depreciating assets. Advises the company regarding the selection of the project.

3.5 SUMMARY

Capital investment decisions are complex decisions as they involve estimating future cash flows associated with that particular investment. There are broadly two techniques which are used for appraising the worth of an investment project:

(i) Discounted cash flow criteria
(ii) Non discounted cash flow criteria.

The basic difference between these two techniques is that the former uses the concept of the time value of money, whereas in the latter technique absolute returns are used.

3.6 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) Write short notes on 'Internal Rate of Return'.

2) Write short notes on 'Capital Rationing'.

3) Write short notes on an 'Average Rate of Return'.

4) What is meant by 'Internal Rate of Return' of a project? How do you calculate I.R.R (Internal Rate of Return) given the initial investment on the Project and cash flows arising during the expected life of the Project?

5) Write short notes on 'Accounting Rate of Return'.

6) Distinguish clearly between Average rate of return and Internal rate of return.

7) Explain the operation of any two techniques (one a discounting method and another a none-discounting one for evaluation of investment decisions.

8) Write short notes on 'Profitability Index'.

9) What criteria must be satisfied for an investment evaluation to be ideal?

10) Can the payback period method of evaluating projects identify the ones that will maximise wealth? Explain.

11) Consider two projects, AA and BB, that have identical, positive net present values, but project BB is riskier than AA. If these projects are mutually exclusive, what is your investment decision?

12) Can the net present value method of evaluating projects identify the ones that will maximise wealth? Explain.

13) The decision rules for the net present value and the profitability index methods are related. Explain the relationship between these two sets of decision rules.

14) What is the source of the conflict between net present value and the profitability index decision rules in evaluating mutually exclusive projects?

15) Suppose you calculate a project's net present value to be Rs.3,000, what does this mean?

16) Suppose you calculate a project's profitability index to be 1.4. What does this mean?

17) The internal rate of return is often referred to as the yield on an investment. Explain the analogy between the internal rate of return on an investment and the yield-to maturity on a bond.

18) The net present value method and the internal rate of return method may produce different decisions when selecting among mutually exclusive projects. What is the source of this conflict?

19) The modified internal rate of return is designed to overcome a deficiency in the internal rate of return method. Specifically, what problem is the MIRR designed to overcome?

20) Based upon our analysis of the alternative techniques to evaluate projects, which method or methods are preferable in terms of maximising owners' wealth?

21) You are evaluating an investment project, Project ZZ, with the following cash flows?

Period	Cash Flow Rs.
0	100,000
1	35,027
2	35,027
3	35,027
4	35,027

Calculate the following:

(a) Payback period
(b) Net present value, assuming a 10% cost of capital
(c) Net present value, assuming a 16% cost of capital
(d) Profitability index, assuming a 10% cost of capital
(e) Internal rate of return

26) You are evaluating an investment project, Project YY with the following

cash flow:

Period	Cash Flow Rs.
0	100,000
1	43,798
2	35,027
3	35,027
4	35,027

Calculate the following:

(a) Payback period

(b) Net present value, assuming a 10% cost of capital

(c) Net present value, assuming a 14% cost of capital

(d) Profitability index, assuming a 10% cost of capital

(e) Profitability index, assuming a 14% cost of capital

(f) Internal rate of return

27) You are evaluating an investment project, Project XX with the following cash flows:

Period	Cash Flow Rs.
0	200,000
1	65,000
2	65,000
3	65,000
4	65,000
5	65,000

Calculating the following:

(a) Payback period

(b) Net present value, assuming a 10% cost of capital

(c) Net present value, assuming a 15% cost of capital

(d) Profitability index, assuming a 10% cost of capital

(e) Profitability index, assuming a 15% cost of capital

(f) Internal rate of return

28) Suppose you are evaluating two mutually exclusive projects, Project/Item 1 and Project/Item 2 with the following cash flows:

End of Year Cash Flows		
Year	Item 1 Rs.	Item 2 Rs.
2000	10,000	Rs.10,000
2001	3,293	0
2002	3,293	0
2003	3,293	0
2004	3,293	14,641

(a) If the cost of capital on both project, is 5% which project, if any, would you choose? Why?
(b) If the cost of capital on both projects is 8% which project, if any, would you choose? Why?
(c) If the cost of capital on both projects is 11% which project, if any, would you choose? Why?
(d) If the cost of capital on both projects is 14% which projects, if any, would you choose? Why?
(e) At what discount rate would you be indifferent between choosing Item 1 and Item 2?
(f) On the same graph, draw the investment profiles of Item 1 and Item 2. Indicate the following terms:

- Crossover discount rate
- NPV of Item 1 if the cost of Capital is 5%
- NPV of Item 2 if cost of Capital is 5%
- IRR of Item 1
- IRR of Item 2

29) Consider the results after analysing the following five projects:

Projects	Outlay Rs.	NPV Rs.
AA	300,000	10,000
BB	400,000	20,000
CC	200,000	10,000
DD	100,000	10,000
EE	200,000	-15,000

Suppose there is a limit on the capital budget of Rs.600,000. Which projects should we invest in, given our capital budget?

30) Consider these three independent projects?

Period	FF Rs.	GG Rs.	HH Rs.
0	100,000	200,000	300,000
1	30,000	40,000	40,000
2	30,000	40,000	40,000
3	30,000	40,000	40,000
4	40,000	120,000	240,000
Cost of Capital	5%	6%	7%

(a) If there is no limit on the capital budget, which projects would you choose? Why?

(b) If there is a limit on the capital budget of Rs.300,000, which projects would you choose? Why?

3.7 SOLUTIONS/ANSWERS

Check Your Progress 1

1) Working notes:

(i) Calculation of Depreciation per annum

$$\text{Existing equipment} = \frac{\text{Rs.}23{,}00{,}000 - \text{Rs.}3{,}00{,}000}{20\,\text{year}} = \text{Rs.}1{,}00{,}000\,\text{p.a.}$$

$$\text{New equipment} = \frac{\text{Rs.}50{,}00{,}000 - \text{Rs.}5{,}00{,}000}{15\,\text{year}} = \text{Rs.}3{,}00{,}000\,\text{p.a.}$$

(ii) Loss on sale of existing equipment

	(Rs.)
Cost	23,00,000
Less Deprecation (Rs)1,00,000×10 *years*)	10,00,000
	13,00,000
Less: Exchange value	6,00,000
Loss on exchange with new equipment	7,00,000

Loss per annum = Rs. 7,00,000/10 years = Rs. 70,000 p.a

(iii) Calculation of Interest (cash outflow) on purchase of new equipment

	(Rs.)
Cost of new equipment	50,00000
Less Exchange value of old equipment Deprecation	6,00,000
Net cash outflow	44,00,000
Interest (Rs. 44,00,000×10/100)	6,00,000

Comparative statement showing total conversation cost as well as cost 1,000 units.

Particulars	Equipment	
	Old	New
Annual Depreciation	1,00,000	3,00,000
Loss on sale of old equipment	-	70,000
Interest on capital	-	4,40,000
Wages	1,00,000	1,20,000
Repairs and Maintenance	20,000	52,000
Consumables	3,20,000	4,80,000
Power	1,20,000	1,50,000
Allocation of fixed expenses	60,000	80,000
Total conversation Cost (i)	7,20,000	16,92,000
Total run hours p.a (ii)	2,400	2,400
Operating Cost per hour (rs.) (i) (ii)	300	705

Output per hour (Units)	1,200	3000
Operating Cost (per 1,000 Units Units Rs.)	250	235

Analysis:

On replacement of existing equipment with new equipment there is a saving of Rs. 15 (i.e., Rs. 250- Rs. 235) per 1,000 units. Hence, replacement is recommended.

2) Let the initial selling price per unit of new product be 'x'

Then total sales = 8000 units $\times$ x = 8,000 x

Calculation of cash costs p.a

(Rs.)

Variable costs	(8,000 units $\times$ Rs. 250	20,00,000
Advt. And other expenses		1,50,000
Addl. Fixed operating cost		75,000
Total Cash costs p.a		22,25,000

Depreciation p.a	$\frac{\text{Rs.}25,00,000}{4\text{ years}}$	Rs. 6,25,000 p.a
Profit before Tax	8,000 x–(22,25,000+6,25,000)	8,000x–28,50,000
Tax @ 40% on Profit	0.40 (8,000x–28, 50,000	3,200x–11,40,000
Total Cash outflow	22,25,000+3,200x–11, 40,000	3,200x+10,85,000
Net Annual Cash inflow	8,000 $\times$ –(3,200x+10,85,000)	4,800x–10,85,000
Initial cash outflow	Present value of cash inflow	
Rs. 25,00,000	(4,800 $\times$ -10, 85,000) $\times$ 3.0079	
25,00,000	14,438 $\times$ -32,63,571.50	
14.438x	25,00,000+32,63,571.50	
14.438x	57,63,57,1.50	
X	57,63,51.50/14,438	Rs. 399.20

Hence, the initial selling price of the new product is Rs. 399.20 per unit.

3) (i) NPV and IRR for the two project proposals:

Year	AXE			BXE		
	Cash flows Rs. Lakhs	Discount Factor @ 16%	Total PVs Rs. Lakhs	Cash flows Rs. Lakhs	Discount Factor @ 16%	Total PVs Rs. lakhs
0	22.50	1.000	22.50	30.00	1.000	30.00
1	6.00	0.862	5.17	5.00	0.862	4.30
2	12.50	0.743	9.29	7.50	0.743	5.57
3	10.00	0.641	6.41	7.50	0.641	4.81
4	7.50	0.552	4.14	12.50	0.552	6.90
5				12.50	0.476	5.95
6				10.00	0.410	4.10

7				8.00	0.354	2.83
Net Present value			2.51			4.46
Year	AXE			BXE		
	Cash flows Rs. Lakhs	Discount Factor @20%	Total PVs Rs. Lakhs	Cash flows Rs. Lakhs	Discount Factor @ 24%	Total PVs Rs. Lakhs
0	22.50	1.000	22.50	30.00	1.000	30.00
1	6.00	0.833	5.00	5.00	0.806	4.03
2	12.50	0.694	8.68	7.50	0.650	4.88
3.	10.00	0.579	5.79	7.50	0.524	3.93
4	7.50	0.482	3.62	12.50	0.423	5.29
5	-	-	-	12.50	0.341	4.26
6	-	-	-	10.00	0.275	2.75
7	-	-	-	8.00	0.222	1.78
Profit Value			23.09			26.92
Less Initial Outlay			22.50			30.00
NPV			0.59			3.08

IRR

Project AXE $= 16 + \frac{2.51}{2.51 - 0.59} \times 4$ = 16+5.23 = 21.23%

Project BX $= 16 + \frac{4.46}{4.46 + 3.08} \times 8$ = 16+4.73 = 20.73%

(ii) Analysis:

The IRRs of both projects AXE and BXE are very similar, with barely one-half % separating them from each other. In such a case of marginal difference, it would be necessary to re-validate key assumptions and use sensitivity analysis to determine impact upon project returns to changes in key variables. The project that is less sensitive to such variations may be preferred. Also while NPVs and IRRs may provide a basis for financial decision-making, it is very important to check whether either project is in line with corporate strategy. The one more in tune with such strategy may be preferred even if the financial numbers are not the highest among the competing proposals.

Check Your Progress 2

1) (i) Net Present Value (NPV) (10% discounting)

(Rs. Lakhs)

Year	EFAT		PV Factor at 10%	Total PV	
	X	Y		X	Y
0	700	700	1.000	700	700
1	100	500	0.909	90.90	454.50
2	200	400	0.826	165.20	330.40
3	300	200	0.751	225.30	150.20
4	450	100	0.683	307.35	68.30

5	600	100	0.621	372.60	62.10
			Net Present value	461.35	365.50

(ii) Internal Rate of Return (IRR)

Project X (Rs. In lakhs)

Year	CFAT X	PV Factor At		Total PV At	
		27%	28%	27%	28%
0	700	1.0	1.0	700.00	700.00
1	100	.787	.781	78.70	78.10
2	200	.620	.610	124.00	122.00
3	300	.488	.477	146.40	143.10
4	450	.384	.373	172.80	167.85
5	600	.303	.291	181.80	174.60
NPV				3.70	14.35

$$\text{IRR} = 27 + \frac{3.70}{3.70 + 14.35} \times 1 = 27 + 0.205 = 27.21\%$$

Project X (Rs. In lakhs)

Year	CFAT X	PV Factor at		Total PV At	
		37%	38%	37%	38%
0	700	1.000	1.000	700.00	7.00.00
1	500	.730	.725	365.00	362.50
2	400	.533	.525	213.20	210.00
3	200	.389	.381	7.80	6.20
4	100	.284	.276	28.40	27.60
5	100	.207	.200	20.70	20.0
NPV				5.10	3.00

$$\text{IRR} = 37 + \frac{5.10}{5.10 + 3.00} \times 1 = 37 + 0.63 = 37.63\%$$

(iii) Profitability Index

PI	$\frac{\text{Total P.V. of cash inflow @ 10\%}}{\text{Initial cash outlay}}$
Project X	$\frac{\text{Rs. 1,161.35 Lakhs}}{\text{Rs. 700 Lakhs}} = 1.659$

Project Y	$\frac{\text{Rs.1,065.50 Lakhs}}{\text{Rs.700 Lakhs}} = 1.522$

2) Computation of NPV of the Projects

(Rs. in Lakhs)

Particulars		Project A	Project B
Profit after Tax	(10% of cost of Project	10.00	15.00
Add: Depreciation	(p.a)	12.00	17.00
Net cash inflow p.a		22.00	32.00
Present value of Net cash inflow for 8 years @ 10% annuity i.e. annuity factor 5.335		117.370	170.72
Present value of salvage value at the end of 8th year at 0.467		1.868	6.538
P.V. of Total Cash inflow		119.238	177.258
Less: Initial investment		100.000	150.000
Net Preset Value		19.238	27.258

Analysis:
Under the NPV analysis of Projects, Project B has higher NPV. Hence, Project B is suggested for implementation.

3) Computation of net present value of the projects

Project "X" (Rs. in Lakhs)

End of year	Cash flow	Deprec-iation	PBY	Tax	PAT	Net C.F. (PAT+Deprn.)	Discount factor @ 15%	P.V
1	25	15	10	5	5	20	0.870	17.40
2	35	15	20	10	10	25	0.756	18.90
3	45	15	30	15	15	30	0.658	19.74
4	65	15	50	25	25	40	0.572	22.88
5	65	15	50	25	25	40	0.497	19.88
6	55	15	40	20	20	35	0.432	15.12
7	35	15	20	10	10	25	0.376	9.40
8	15	15	-	-	-	15	0.27	4.91
PV of cash inflows								128.23
Less: Initial investment								120.00

Net Present Value							10.33

Project "Y"

End of year	Cash flow	Deprec-iation	PBY	Tax	PAT	Net C.F. (PAT+Deprn.)	Discount factor @ 15%	P.V
1	40	20	20	10	10	30	0.870	26.40
2	60	20	40	20	20	40	0.56	30.24
3	80	20	60	30	30	50	0.658	32.90
4	50	20	30	15	15	35	0.572	20.02
5	30	20	10	5	5	25	0.497	12.43
6	20	20	-	-	-	20	0.432	8.64
PV of cash inflows								130.33
Less: Initial investment								120.00
Net Present value								10.33

As Project "Y" has a higher Net Present Value. It should be taken up.

UNIT 4 WORKING CAPITAL DECISIONS

Structure **Page Nos.**

4.0 INTRODUCTION

The decisions regarding long-term investment are based on judgments on future cash flows, the uncertaininty of these cash flows and the opportunity cost of the funds to be invested. As far as working capital management decisions are concerned the underlying criteria are the same but, there is an increased focus on liquidity and management of operating cycle. Operating cycle refers to the time it takes to convert current assets (excluding cash) into cash. The operating cycle in part determines how long it takes for a firm to generate cash from current assets and therefore the risk and cost of its investment in current assets or working capital. Working capital is the capital that can be immediately put to work to generate the benefits of capital investment. Working capital is also known as current capital or circulating capital.

The major difference between long-term financial management and short-term financial management (also referred to as working capital management) is with regards to quantum and frequency of cash flows. In case of long-term financial management the amount of funds dedicated are usually large and one off decisions whereas, in case of short term financing the amount of funds dedicated are relatively small and frequently repetitive in nature. The impact of long term financing ranges over an extended period of time usually 15-20 years or more, whereas, the impact of short term financing is within the operating cycle usually ranging form three months to a year.

There are two concepts of working capital:

(i) Gross working capital

(ii) Net working capital

The gross working capital is the total of all current assets. Net working capital is the difference between current assets and current liabilities. The constituents of working capital are shown in *Table 4.1.* Part A of this table shows current assets and part B of this table shows current liabilities.

Table 4.1: Constituents of current assets and current liabilities

Part A	Part B
Current Assets	**Current Liabilities**
Cash and Bank Balances	Sundry Creditors
Inventories	Trade Advances
Raw material and components, work in progress/process (WIP) finished goods, trade debtors, loans and advances, investments, pre-paid expenses	Borrowings (short term) Outstanding expenses Taxes and dividends payable, Other liabilities maturing within a year

This unit deals with certain aspects and considerations related to overall working capital management and is divided into the following sections:

- characteristics of current assets
- factors influencing working capital requirements
- levels of current assets
- current assets financing policy
- profit criterion for current assets
- operating cycle analysis
- impact of inflation on working capital
- approaches to bank financing
- methods for estimating working capital requirements
- source of working capital finance

4.1 OBJECTIVES

After going through this unit, you would be able to:

- understand the concept and characteristics of working capital;
- understand the difference between net working capital and gross working capital;
- understand the concept of operating cycle;
- understand how the various factors influence working capital requirements; and
- understand the various methods of computing working capital.

4.2 CHARACTERISTICS OF CURRENT ASSETS

Working Capital management is influenced by two characteristics of current assets which are as follows (i) short life span (ii) swift transformation into other asset forms.

Current assets have a short life span, cash balances can remain idle for 7 to 14 days, while accounts receivable usually have a life span ranging from 30 to 90 days and inventories may be held for 30 to 100 days.

Each current asset is transformed into another current asset. This transformation will depend upon the time and degree of synchronisation of procurement, production, sales and collection of receivables.

The production process starts with the purchase of raw material resulting in either decrease in cash or creation of accounts payable. The raw material purchased from the inventory, which is further processed to produce finished goods. Finished goods are

sold resulting in either increase in cash or creation of accounts receivable while the discharge of accounts payable results in cash outflow. The current asset cycle and the operating cycle are shown in *Figures 4.1* and *4.2* respectively.

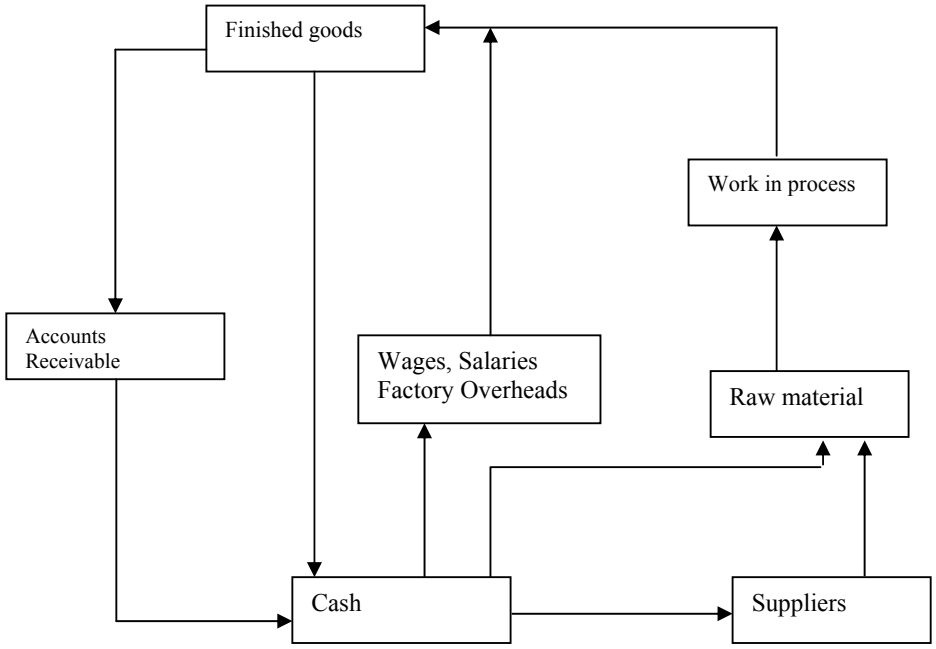

Figure 4.1: Current asset cycle

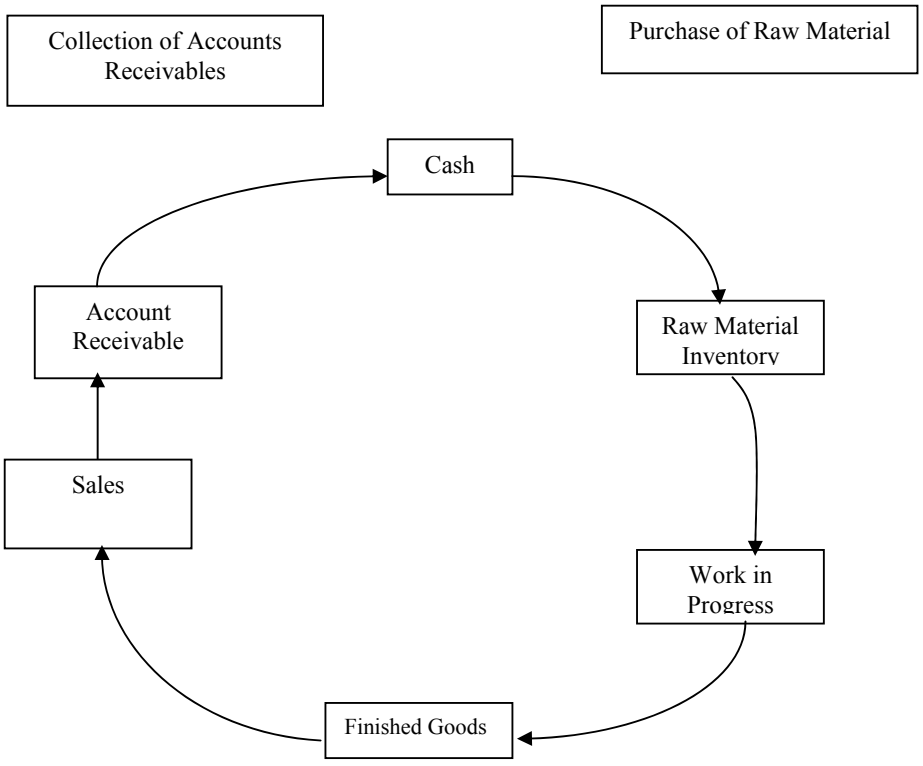

Figure 4.2: Operating Cycle

4.3 OPERATING CYCLE CONCEPTS

Operating cycle refers to the average time lapse between the acquisition of raw material and the final cash realisation. This concept is used to ascertain the requirements of cash working capital to meet the operating expenses. *Figure 4.3* depicts the operating cycle and the cash cycle.

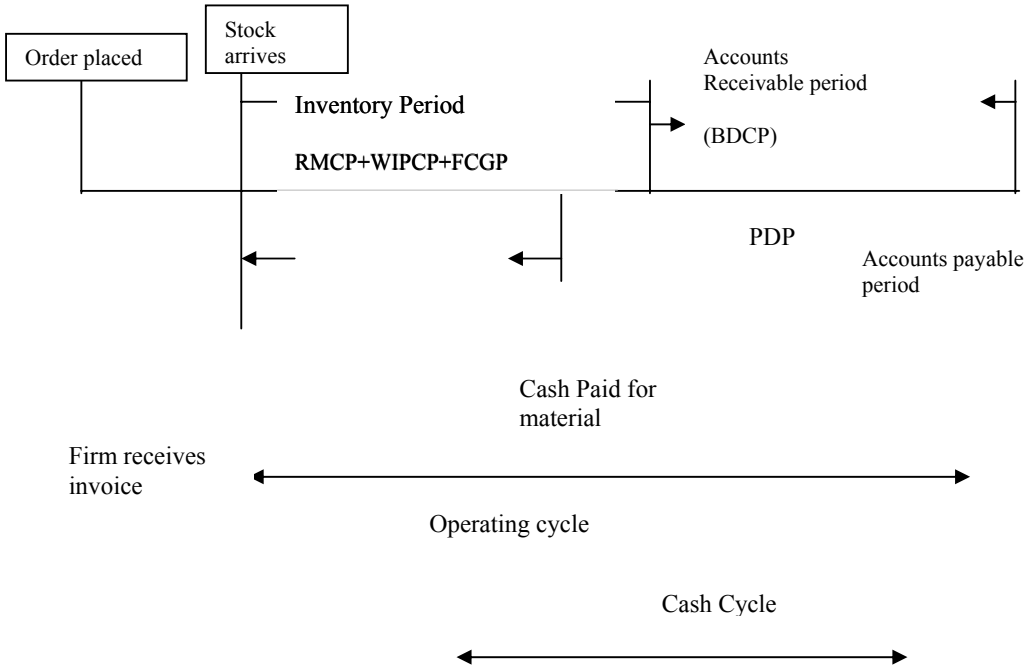

Figure 4.3: Operating cycle

From the above figure you can easily estimate that the time which lapses between the purchase of raw material and the collection of cash for sales is referred to as operating cycle, whereas the time length between payment of raw material purchases and collection of cash for sales is referred to as cash cycle.

In the operating cycle the inventory period consists of:

(i) Raw Material Conversion Period (RMCP), which is the time gap between purchase of raw material and the issuance of raw material for production.

(ii) Work in Progress Conversion Period (WIPCP), which is the time gap between issuance of raw material and the conversion of raw material into finished goods.

(iii) Finished Goods Conversion Period (FGCP), which is the time gap between sale of goods and the transfer of finished goods from shop floor to the warehouse.

(iv) Book Debt Collection Period (BDCP), which is the time gap between sales and realisation of cash

Now the length of the operating cycle for direct material can be calculated as follows:

Gross operating cycle = RMCP+WIPCP+FGCP+BDCP

Net Operating Cycle = Gross Operating Cycle – PDP
= RMCP+WIPCP+FGCP+BPCP-PDP

Where PDP is the Payment Deferral Period PDP is the credit time extended by suppliers to pay for the purchases.

4.4 FACTORS INFLUENCING WORKING CAPITAL REQUIREMENTS

The working capital needs of a firm are influenced by many factors. The important ones are as follows:

1. **Nature of business:** The working capital requirement of a firm is closely related to the nature of its business. In general businesses with short operating cycles will require lesser amount of working capital as compared to businesses with longer operating cycles. The firms engaged in manufacturing and trading will require more working capital as large amount of funds are locked in inventories and receivables. In general utility companies and service companies (water supply, electricity undertakings, telecom companies) will require lesser amount of working capital as compared to manufacturing and trading concern. Table 4.2 shows the relative proportion of investment in current assets and fixed assets of certain industries.

Table 4.2: Proportion of current assets and fixed assets

Current Assets %	Fixed Assets %	Industries
10-20 20-30	80-90 70-80	Hotels and restaurants Electricity generation and Distribution
30-40 40-50	60-70 50-60	Aluminum and Shipping Iron and Steel, Basic industries, Chemicals
50-60 60-70	40-50 30-40	Tea plantation Cotton textiles, Sugar
70-80 80-90	20-30 10-20	Edible oils, Tobacco Trading, Construction

2. **Business Cycle:** During economic boom there is increased production which require higher amount of working capital, but this is partly off set by reduced operating cycle. At the time of economic recession again there would be need for increased working capital, as large amount of funds would be locked in inventories and receivables.

3. **Seasonal Variations:** Commodities with seasonal demand results in increased level of working capital requirement. This could be offset by scaling down operations during the lean part of the year and increasing production prior to demand period. Products manufactured with raw materials, the production of which is seasonal (agricultural products) would require higher amount of working capital.

4. **Size of Business:** Size of the firm is also a determining factor in estimating working capital requirements. The size of a firm may be measured either in terms of scale of operations, or assets or sales. Large firms require more amount of working capital for investment in current assets and also to pay current liabilities than smaller firms. However, in some cases even a small firm may need more working capital as a cushion against cash flow interruptions.

5. **Change of Technology:** Changes in technology generally leads to improvements in the efficient processing of raw material, decrease in wastages, higher productivity and more speedy production. All these improvements lead to reduction in investment in inventories, which in turn leads to reduction in working capital requirement. If changed technology results in shorter manufacturing process the lesser would be the requirements of working capital.

6. **Length of Operating or Working Capital Cycle:** As explained in the section dealing with operating cycle concept of working capital the amount of working capital will depend upon the duration of operating cycle. The operating cycle in turn is dependent on many other variables such as length of manufacturing process, debtors collection period, etc.

7. **Firms credit policy:** The credit policy of the firm also impacts working capital needs. A firm following liberal credit policy will require more amount of working capital, as a large amount of funds would be blocked in debtors.

4.5 SOURCES OF WORKING CAPITAL

Sources of Working Capital Finance

Working capital finance may be classified into the following:

- **Spontaneous Source of Finance**

  Finance which naturally arise in the course of business is known as spontaneous financing. Trade creditors, credit from employees, credit from suppliers of services, etc., are the examples of spontaneous financing.

- **Negotiated Financing**

  Financing which has to be negotiated with lenders, say commercial banks, financial institutions, general public is known as negotiated financing. This kind of financing may either be short-term in nature or long-term.

  Before spontaneous and negotiated sources of finance, the latter is more expensive and inconvenient to raise. Spontaneous source of finance reduces the amount of negotiated financing. Working capital can be classified into long-term and short-term sources, which can be analysed as shown in *Figure 4.4*

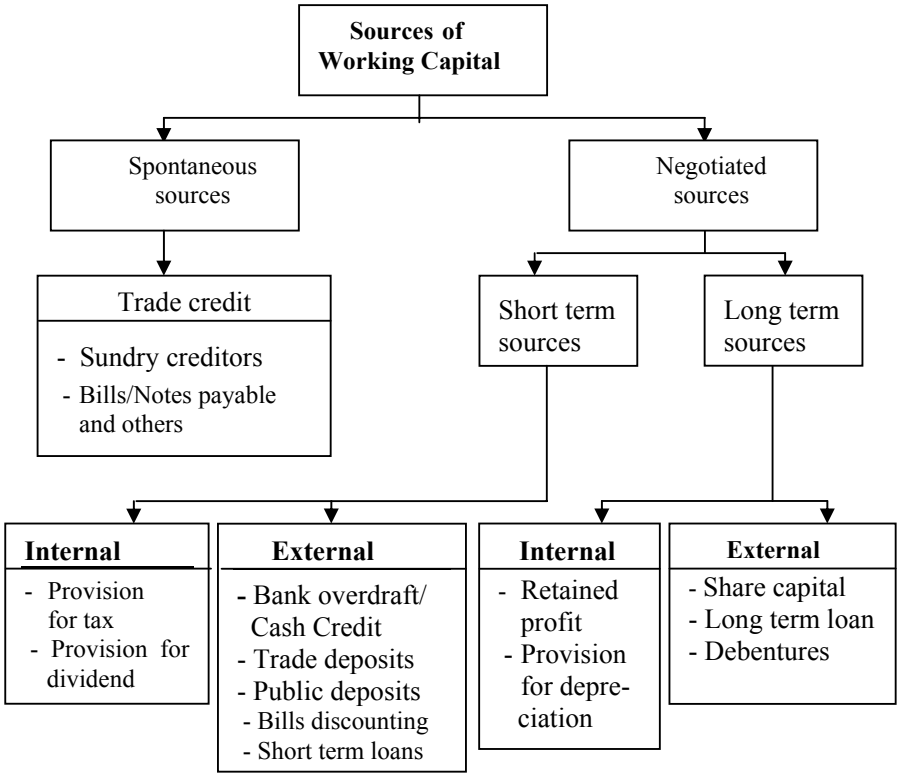

Figure 4.4: Financing Mix of Working Capital

- **Trade Credit**

Trade credit is a spontaneous source of finance which is normally extended to business organization depending on the custom of the trade and competition prevailing in the industry and relationship of the suppliers and buyers. This form of business credit is more popular since it contributes to about one-third of the total short-term credit. The dependence on this source of working capital finance is higher due to negligible cost of finance as compared to negotiated finances.

It is a facility whereby business firms are allowed by the suppliers of raw materials, services, components and parts, etc., to defer immediate payment to a definite future period. Trade credit is generated when a company acquires supplies, merchandise or materials and does not pay for them immediately. If a buyer is able to get the credit without any legal evidence or instrument, it is termed as *'Open Account Trade Credit'* and appears in the Balance Sheet of the buyer as sundry creditors. When an instrument is given, notably negotiable instrument, in acknowledgement of the debt, the same appears in the final statement as Bills or Notes payable.

- **Invoice Discounting or Factoring**

  If a company makes sales to a number of customers on credit terms it will have to wait for two or even three months before its debtors pay what they owe. This means that the debtors must be financed by the company, and the idea of factoring is to passover to the finance of debtors from the selling company to a special factoring, finance company or Bank. The factoring company after reviewing the amount of the debts and the creditworthiness of the debtors, will pay the selling company, at the end of the month in which the sales were made, the amount it can expect to receive from the debtors (less a percentage). In this way the selling company receives its money one or two months earlier than would normally be the case. The factoring company will then collect the debts from the selling company's customers when they fall due.

- **Bills of Exchange**

  A bill is defined as an unconditional order in writing, addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to, to pay on demand, or at a fixed or determinable future time, a sum certain in money to or to the order of a specified person or to the bearer.

- **Funds Generated from Operations**

  Funds generated from operations, during an accounting period, increase working capital by an equivalent amount. The two main components of funds generated from operations are profit and depreciation. Working capital will increase along with the extent of funds generated from operations.

- **Deferred Tax Payments**

  Another source of short-term funds similar in character to trade credit is the credit supplied by the tax authorities. This is created by the interval that lapses between the earning of the profits by the company and the payment of the taxes due on them.

- **Accrued Expenses**

  Another source of spontaneous short-term financing is the accrued expenses that arise from the normal conduct of business. An accrued expense is an expense that has been incurred, but has not yet been paid. For most firms, one of the largest accrued expenses is likely to be employees' accrued wages. For large firms, the accrued wages held by the firm constitute an important source of

financing. Usually, accrued expenses are not subject to much managerial manipulation.

- **Working Capital Finance from Banks**

  Working capital is an essential requirement for any business activity. Banks in India today constitute the major suppliers of working capital credit to any business activity. Recently, however, some term lending financial institutions have also announced schemes for working capital financing.

- **Bank Overdrafts**

  Short-term borrowing of the kind made available principally by the clearing banks in the form of overdrafts is very flexible. When the borrowed funds are no longer required they can quickly and easily be repaid. It is also comparatively cheap. The banks will impose limits on the amount they can lend.

- **Line of Credit**

  Line of credit is a commitment by a bank to lend a certain amount of funds on demand specifying the maximum amount of unsecured credit the bank will permit the customer to borrow at any point of time. The bank will charge extra cost over the normal rate of interest since it will keep the funds available to be made use of the funds by the customer at all times.

- **Revolving Credit**

  The revolving credit facility will be given by the banker to the customer by giving certain amount of credit facility on a continuous basis. The borrower will not be allowed to exceed the limits sanctioned by the bank. Such credit facilities will be given by the banks to their customers in the form of over draft facility. In customer financing, credit cards are known for this source of financing.

- **Bridge Loans**

  Bridge loans are available from the banks and financial institutions when the source and timing of the funds to be raised is known with certainty. When there is a time gap for access of funds, then for speeding up of or implementation of the projects, bridge loans will be provided. Such loans are repaid immediately after raising the funds. The cost of bridge loans is normally higher than the working capital facilities provided by the banks. At present the RBI has put a restriction on banks in giving bridge loans to curb malpractices in capital market dealings.

- **Transaction Loans**

  These loans are provided by the Banker for short periods for a specific activity like financing for a civil contract work. When the customer receives payment, the transaction will be repaid by the customer. The lender will evaluate the ability of the cash flow of the borrower before sanctioning this type of loan.

- **Public Deposits**

  Deposits from the public is one of the important source of finance particularly for well established big companies with a huge capital base. The period of public deposits is restricted to a maximum of three years at a time and hence, this source can provide finance only for short term to medium term, which could be more useful for meeting the working capital needs of the company. It is advisable to use the amounts of public deposits for acquiring assets of long-term nature unless its pay back period is very short.

- **Suppliers Line of Credit**

  Under this scheme, non-revolving line of credit is extended to the seller to be utilised within a stipulated period. Assistance is provided to manufactures for promoting sale of their industrial equipments on deferred payment basis. While on the other hand, this credit facility can be availed of by actual users for purchase of plant/equipment for replacement of modernisation scheme only.

- **Hire Purchase and Leasing**

  It is a most familiar form of medium term financing in acquiring plant and machinery, vehicles, etc. In hire purchase transactions, the purchaser of goods will acquire the possession of goods on payment of initial deposit, but the title to the goods will only be passed on from seller to the purchaser after the payment of the remaining installments.

- **Intercorporate Loans and Deposits**

  In the present corporate world, it is a common practice of companies with surplus cash to lend to other companies for a short period normally ranging from 60 days to 180 days. The rate of interest will be higher than the bank rate of interest and will depend on the financial soundness of the borrower company. This source of finance reduces the intermediation of banks in financing.

- **Commercial Paper (CP)**

  The CP introduced into the Indian financial market, on the recommendations of the *Vaghul Committee* has become a popular debt instrument of the corporate world. CP is a debt instrument for short-term borrowing, that enables highly rated corporate borrowers to diversify their sources of short-term borrowings, and provides an additional financial instrument to investors with a freely negotiable interest rate. The maturity period ranges from three months to less than a year. Since it is a short-term debt, the issuing company is required to meet dealers' fees, rating agency fees and any other relevant charges. Commercial paper is short-term unsecured promissory note issued by corporations with high credit ratings.

  Salient Features:

  Eligibility Criteria: A company can issue CP only if:

  1) Its tangible net worth is not less than Rs. 4 crore as per the latest audited balance sheet;
  2) Its fund based working capital limit is not less than Rs. 4 crore;
  3) It has obtained the specified minimum credit rating for issuance of CP from an approved credit rating agency. Such credit rating should not be more than 2 months old at the time of issue of the CP;
  4) Its borrowal account is classified as 'standard' by the financing bank; and
  5) It has a minimum current ratio of 1.33:1 as per the latest audited balance sheet and the classification of current assets and liabilities are in conformity with the Reserve Bank guidelines issued from time to time.

- **Bank Guarantees**

  Bank guarantee is one of the facilities that the commercial banks extend on behalf of their clients in favour of third parties who will be the beneficiaries of the guarantees. In fact, when a bank guarantee is given, no credit is extended and banks do not part with any funds. There will be only a guarantee to the beneficiary to make payment in the event of the customer on whose behalf the guarantee is given, defaults on his commitment. So, if the customer fails to pay as per the terms of the guarantee, the banker giving the guarantee has to pay and

claim reimbursement from his client. The banker's liability arises only if this customer fails to pay the beneficiary of the guarantee. That is why bank guarantee limits are known as non-borrowings limits or not-fund limits.

- **Asset Securitisation**

  The emerging financial scenario has created a fierce competition among the companies to raise funds through innovative financial products from the capital and/or money markets. Additional source of capital can be accessed through securitisation, relieving the normal receivable/deposit collection process for finance companies and banks, without disturbing the liabilities side of the balance sheet. Companies can raise finance and increase their lending activity thus, enhancing profitability.

  Meaning:

  The term *'Securitisation'* refers to both switching away from bank intermediation to direct financing via capital market and/or money market, and the transformation of a previously illiquid asset like automobile loans, mortgage loans, trade receivables, etc., into marketable instruments.

  "Securitisation is a process of transformation of illiquid asset into security which may be traded later in the open market."

  "Securitisation is the process of transforming the assets of a lending institution into negotiable instruments."

- **Consortium Lending and Loan Syndication by Banks**

  When the individual bank finds it difficult to meet the huge financial requirements of a borrower, it gives rise to multiple banking which may be in the form of (i) Consortium Lending or (ii) Loan Syndication.

  Consortium Lending: When the financial needs of a single unit are more than a single bank can cater to, then more than one bank comes together to finance the unit jointly spreading the risk as well as sharing the responsibilities of monitoring and finance. The arrangement is called *'consortium lending'* and it enables the industrial units to mobilise large funds for its operations.

  Loan Syndication: There are two methods of syndication: direct lending and through participation.

  - **Direct Lending:** In respect of "direct lending" all the lenders sign the loan agreement independently with the borrower and agree to lend upto their respective share. The obligations of the syndicate members are several and they do not underwrite one another.

  - **Through Participation:** In this method of lending the lead bank is the only lending bank, so far as the borrower is concerned, that approaches the other lender to participate in the loan. This normally takes place without the knowledge of the borrower. The lead bank grants a certain portion of the loan to each participant as agreed. It also agrees to pay to the participants a *pro rata* share of receipts from the borrower.

4.6 STRATEGIES IN WORKING CAPITAL MANAGEMENT

So far banks were the sole source of funds for working capital needs of the business sector. At present more finance options are available to a Finance Manager to enable smooth functioning of his/her firm. Depending on the risk exposure of business, two strategies are evolved to manage working capital.

Conservative Working Capital Strategy

A conservative strategy suggests the carrying high levels of current assets in relation to sales. Surplus current assets enable the firm to absorb sudden variations in sales, production plans, and procurement time without disrupting production plans. Additionally, the higher liquidity levels reduce the risk of insolvency. But lower risk translates into lower return. Large investments in current assets lead to higher interest and carrying costs and encouragement for inefficiency. But a conservative policy will enable the firm to absorb day to day business risks. It assures continuous flow of operations and eliminates worry about recurring obligations. Under this strategy, long-term financing covers more than the total requirement for working capital. The excess cash is invested in short term marketable securities and in need, these securities are sold off in the market to meet the urgent requirements of working capital.

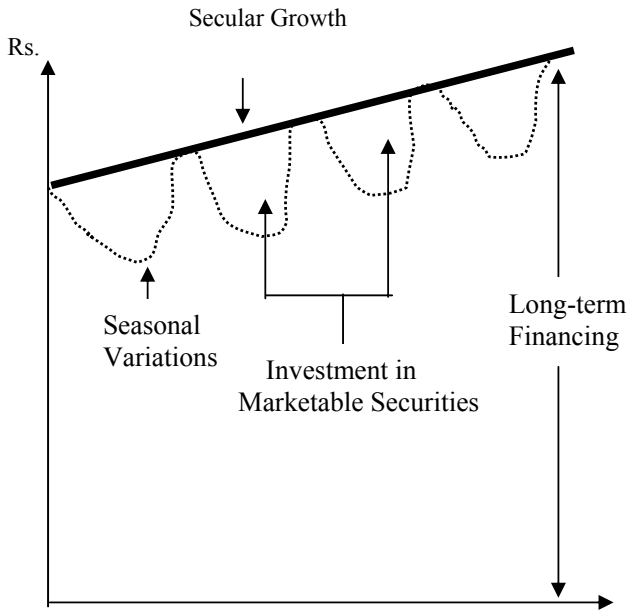

Figure 4.5: Conservative working capital strategy

Aggressive Working Capital Strategy

Under this approach current assets are maintained just to meet the current liabilities without keeping any cushion for the variations in working capital needs. The core working capital is financed by long-term sources of capital, and seasonal variations are met through short-term borrowings. Adoption of this strategy will minimise investment in net working capital and ultimately lower the cost of financing working capital. The main drawback of this strategy is that it necessitates frequent financing and also increases risk as the firm is vulnerable to sudden shocks.

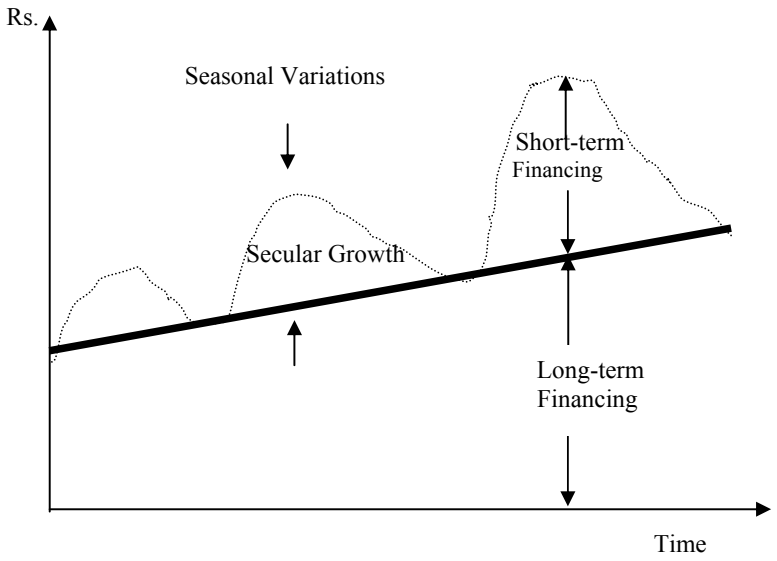

Figure 4.6: Aggressive Working Capital Strategy

A conservative current asset financing strategy would go for more long-term finance which reduces the risk of uncertainty associated with frequent refinancing. The price of the firm has to pay for adopting of this strategy is higher financing costs since, long-term rates will normally exceed short term rates. But when such an aggressive strategy is adopted, sometimes the firm runs into mismatches and defaults.
It is the cardinal principle of corporate finance that long-term assets should be financed by long-term sources and short-term assets by a mix of long and short-term sources.

4.7 ESTIMATING WORKING CAPITAL REQUIREMENTS

The most ticklish problem that is faced by the finance manager is the determination of the amount of working capital requirement at a particular level of production. To solve this problem, estimates of future requirements of current assets and cash flows are made. With the help of these cash flows, future requirements and availability of cash for current assets are ascertained. For this purpose a working capital forecast is prepared involving some calculations after taking into consideration the factors affecting working capital (as discussed above). All these calculations are made on cash basis. Thus, estimation of working capital is the determination of future cash requirements of a firm so that the liquidity of financial resources may be maintained. Following methods are generally used in estimating working capital for the future period:

a) Operating Cycle Method
b) Net Current Assets Forecasting Method
c) Projected Balance Sheet Method
d) Adjusted Profit and Loss Method
e) Cash Flow Forecast Method

a) **Operating Cycle Method**

Under this method, total operating expenses for a period are divided by the number of operating cycles in the relevant period to calculate the cash requirement for working

capital. Thus, the computation of total operating expenses, operating cycle period and number of operating cycles in the year is essential for estimating the amount of working capital, as discussed below:

1. **Operating Expenses:** These expenses include purchase of raw materials, direct labour cost, fuel and power, administrative and selling and distribution expenses for a specific period for which estimates can be obtained from cost records. Depreciation, write off of intangible assets are not included in these expenses because these are non-cash items. Similarly, tax and dividend being appropriation of profits are also excluded from these expenses. Capital expenses are also not included in it. While estimating the amount of these expenses fact like changes in product mix, introduction of a new product or discontinuation of an old product should be made for the changes occurring in expenses and price level due to internal and environmental factors.

2. **Operating Cycle Period:** Period of operating cycle means the total number of days involved in the different stages of operation commencing from the purchase of raw materials and ending with collection of sale proceeds from debtors after adjusting the number of days credit allowed by suppliers. Thus, the operating cycle is the total period involved in different stages of operations, which may be calculated by using the following formula:

$$OC = M+W+F+D-C$$

Here, OC = Operating Cycle Period
M = Material Storage Period
W = Work in Process or Conversion Period
F = Finished Goods Storage Period
D = Debtors Collection Period
C = Creditors Payment Period

$$\text{Material Storage Period (M)} = \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}}$$

Or

$$= \frac{(\text{Opening Stock} + \text{Closing Stock})1/2}{\text{Material Consumed for the Year}/365}$$

$$\text{WIP or Conversion Period (W)} = \frac{\text{Average Stock of Work} - \text{in} - \text{Process}}{\text{Daily Average Production Cost}}$$

OR

$$= \frac{(\text{Opening WIP} + \text{Closing WIP})/2}{\text{Total Production Cost}/365}$$

(a) Total Production or Factory Cost is calculated by adding opening stock of work-in progress in the total of direct material, labour and factory overheads and deducting from this the closing work-in-progress. Depreciation is excluded being a non-cash item.

(b) Sometimes the Conversion Period is also known as the Production Cycle Period. In case, information about this period is given, then conversion period is not to be calculated with the above formula.

$$\text{Finished Goods Storage Period (F)} = \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}}$$

OR

$$\frac{(\text{Opening Stock} + \text{Closing Stock})/2}{\text{Total Cost of Goods Sold}/365}$$

Cost of Goods Sold is calculated by adding excise duty with the factory cost after adjusting opening and closing stock of finished goods. Administration/selling and distribution expenses are not considered in it, because, in financial accounting, stock of finished goods is valued at production or factory cost.

$$\text{Debtors Collection Period (D)} = \frac{\text{Average Debtors}}{\text{Credit Sales Per Day}}$$

OR

$$\frac{(\text{Opening Drs.} + \text{Closing Drs.})/2}{\text{Total Credit Sales}/365}$$

$$\text{Creditors Payment Period (C)} = \frac{\text{Average Creditors}}{\text{Total Credit Purchases}/365}$$

OR

$$= \frac{(\text{Opening Crs.} + \text{Closing Crs.})/2}{\text{Total Credit Purchases}/365}$$

Notes: In respect of the above formula the following points are worth noting

- The 'Average' value in the numerator stands for the average of opening balance and closing balance of the respective items. However, if only the closing balance is available, then even the closing balance may be taken as 'Average'.
- The figure '365' represents number of days in a year. However, there is no hard and fast rule and sometimes even 360 days are considered.
- In the calculation of M, W, F, D and C, the denominator is calculated at cost basis and the profit margin is excluded. The reason being that there is no investment of funds in profits.
- In the absence of any information, total purchases and total sales be treated as credit.

3. **Number of Operating Cycles:** The number of operating cycles in a period are determined by dividing the number of days in a year i.e.365 by the length of net operating cycle. Expressed as formula-

$$\text{No. of Operating Cycles} = \frac{365}{\text{Operating Cycle Period}}$$

4. **Amount of Working Capital:** Once the operating expenses and the number of operating cycles have been determined, the amount of actual working capital required is calculated by dividing the total operating expenses for the period by the number of operating cycles in that period.
For example, if the total operating expenses for the year amounts to Rs. 45,000 and the number of operating cycles in a year are assumed to be 3, the amount of working capital would be Rs.15,000 (Rs.45000/3).

Alternatively, the working capital may be calculated by using the following formula:

$$WC = C + \frac{OC}{N} \times CS$$

where WC = Working Capital
C = Cash Balance Required
OC = Operating Cycle Period
CS = Estimated Cost of Goods sold
N = Number of days in year

5. **Provision for Contingencies**: After ascertaining the amount of working capital as above, a certain amount say 5% or 10% may be added to cover contingencies. It is to be noted that facts based on estimates may not be cent percent accurate. Therefore, this provision is made to cover probable error in these calculations.

Example 4.1: Himalaya Ltd.'s Profit and Loss Account for the year ended 31st December 2005 is given below. You are required to calculate the working capital requirements under operating cycle method.

Trading and Profit & Loss Account
For the year ended 31st December, 2005

Particulars	Rs.	Particulars	Rs.
To Opening stock:		By Sales (Credit)	1,00,000
Raw Materials	10,000	By Closing stock:	
Work-in-Progress	30,000	Raw Materials	11,000
Finished Goods	5,000	Work-in-progress	30,500
To Purchases (Credit)	35,000	Finished Goods	8,500
To Wages & Mfg. Expenses	15,000		
To Gross Profit c/d	1,50,000		1,50,000
			55,000
To Administrative Exp.	15,000	By Gross Profit b/d	
To Selling and Dist.Exp.	10,000		
To Net Profit	30,000		
		Total	
Total	**55,000**		**55,000**

Opening and closing debtors were Rs. 6,500 and 30,500 respectively, whereas opening and closing creditors were Rs 5,000 and Rs. 10,000 respectively.

Solution: Computation of Operating Cycle

1. Raw Material Storage Period:

$$= \frac{\text{Average Stock of Raw Material}}{\text{Daily Average Consumption}}$$

$$= \frac{(\text{Rs.}10{,}000 + 11{,}000)/2}{\text{Rs.}34{,}000/365}$$

$$= \frac{\text{Rs.}10{,}500}{\text{Rs.}93.15} = 113 \text{ days}$$

Raw Material Consumed = Opening Stock +Purchases – Closing Stock
= Rs.10, 000+35,000-11,000
= Rs.34, 000

2. Conversion or Processing Period

$$= \frac{\text{Average Stock of work} - \text{in} - \text{Progress}}{\text{Daily Average Production Cost}}$$

$$= \frac{(\text{Rs.}30{,}000 + 30{,}500)/2}{\text{Rs.}48{,}500/365}$$

$$= \frac{\text{Rs.}30{,}250}{132.88}$$

Production Cost:	Rs.
Opening Work-Progress	30,000
Add: Material Consumed (as Above)	34,000
Add: Wages and Mfg. Expenses	15,000
	79,000
Less: Closing Work-in Progress	30,500
	48,500

3. Finished Goods Storage Period

$$= \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}}$$

$$= \frac{(\text{Rs.}5{,}000 + 8{,}500)/2}{\text{Rs.}45{,}000/365}$$

$$= \frac{\text{Rs.}6{,}750}{\text{Rs.}123.29} = 55 \text{ days}$$

Cost of goods sold:	Rs.
Opening Stock of Finished Goods	5,000
Add: Production Cost (As above)	48,500
	53,500
Less: Closing Stock of Finished Goods	8,500
	45,000

4. Debtors Collection Period

$$= \frac{\text{Average Debtors}}{\text{Daily Average Sales}}$$

$$= \frac{(\text{Rs.}6{,}500 + 30{,}500)/2}{\text{Rs.}1{,}00{,}000/365}$$

$$= \frac{\text{Rs.}18{,}500}{\text{Rs.}273.97} = 67 \text{ days}$$

5. Creditors Payment Period

$$= \frac{\text{Average Creditors}}{\text{Daily Average Purchases}}$$

$$= \frac{(\text{Rs.}5{,}000 + 10{,}000)/2}{\text{Rs.}35{,}000/365}$$

$$= \frac{\text{Rs.}7{,}500}{\text{Rs.}95.89} = 78 \text{ days}$$

6. Net Operating Cycle Period:

OC = M + W + F + D – C
= 113+228+55+67-78
= 385 Days

Computation of Working Capital Requirement

1. Number of Operating Cycle Per Year = $\frac{365}{\text{Net Operating Cycle Period}}$

$$= \frac{365}{385} = 0.948$$

2.

Total Operating Expenses:	**Rs**
Total cost of Production (as per 3)	45,000
Add: Administrative Expenses	15,000
Add: Selling And Distribution Expenses	10,000
	70,000

3. Working Capital Required = $\frac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles in a year}}$

$$= \frac{\text{Rs. } 70,000}{0.948} = \text{Rs. } 73,839$$

Alternatively, $WC = C + \frac{OC}{N} \times CS$

where WC = Working Capital

C = Cash Balance Required

OC = Operating Cycle Period

CS = Estimated Cost of Goods Sold

N = Number of days in a year

$$WC = O + \frac{385}{365} \times \text{Rs. } 70,000$$

= Rs. 73,835

Note: The difference is due to approximation in the number of operating cycle:

☞ Check Your Progress 1

1) From the following information taken from SNS Company; calculate the working capital required using the operating cycle method.

   (1) Annual sales are estimated at 1,00,000 units @ 20 per unit.

   (2) Production and sales quantities coincide and will be carried on evenly throughout the year and production cost is: Material Rs. 10; Labour Rs.4; Overheads Rs. 4 per unit.

   (3) Customers are given 60 days credit and 40 days credit is taken from suppliers.

   (4) 30 days of supply of raw material and 15 days supply of finished goods are kept in stock.

   (5) The production cycle is 30 days and all materials are issued at the commencement of each production cycle.

   (6) A cash balance equal to one-third of the other average working capital is kept for contingencies.

2) From the following information, extracted from the books of a manufacturing company, compute the operating cycle period and working capital required:

Period Covered: 365 days

Average Period Allowed by Supplier: 16 days	**Rs.**
Average total of debtors outstanding	48,000
Raw Material Consumption	4,40,000
Total Production Cost	10,00,000
Total Cost of sales	10,50,000
Sales for the year	16,00,000
Value of Average Stock Maintained:	
Raw Material	32,000
Work-Progress	35,000
Finished goods	26,000

b) **Net Current Assets Forecasting Method**

This is the most practical method of estimating working capital requirements. Under this method, the finance manager prepares a working capital forecast. In preparing this forecast, first of all, an estimate of all the current assets is made on a monthly basis. Thus, estimate of stock of raw materials, amount of raw material that will remain in process, stock of finished goods and outstanding amount from debtors and other receipts will have to be made. This should be followed by an estimate of current liabilities comprising outstanding payments for material, wages, rent, and administrative and other expenses. The difference between the forecasted amount of current assets and current liabilities gives the networking capital requirements of the firm.

To this amount, a flat percentage would be added by way of provision for contingencies. The resulting figure will be the amount of total estimated working capital required. From this, bank finance is to be subtracted, if available. The remaining balance will be the amount of working capital that is to be managed by the firm. The method of forecasting working capital needs is 'cash' technique as all transactions are shown on cash cost basis.

Statement showing working Capital Requirements

(A)	**Current**	**Amount**	**Rs.**
(i)	Stock of Raw Material (for …month consumption)	….	
(ii)	(a) Work-in-Process (for months)	….	
	(b) Direct Labour	….	
	(c) Overheads	….	
(iii)	Stock of finished Goods (for …month's sales)		
	(a) Raw Material		
	(b) (b) Labour		
	(c) Overheads		
(iv)	Sundry Debtors or Receivables (for …month's sales)		
	(a) Raw Material		
	(b) Labour		
	(c) Overheads		

(v)	Payment in Advance (if any)		
(vi)	Balance of Cash (required to meet day-to-day expenses)		

(B)	**Current Liabilities**	
	(i) Creditors (for month's purchase of Raw Materials)	----------
	(ii) Lag in Payment of Expanses	
	(Outstanding expenses …month's)	----------
	(iii) Others (if any)	
	Net Working Capital (A) – (B)	----------
	Add: Provision for Contingencies	
	Total Working Capital Required	

Example 4.2: Prepare an estimate of working capital requirements from the following information of a trading concern:

(a)	Projected Annual Sales	1,00,000
(b)	Selling Price	Rs.8 per unit
(c)	Profit Margin on Sales	25%
(d)	Average Credit Period Allowed to Customers	8 weeks
(e)	Average Credit Period Allowed by Suppliers	4 weeks
(f)	Average Stock Holding in terms of Sales Requirement	12 weeks
(g)	Allow 10% for Contingencies	

Solution:

Statement Showing working Capital Requirements

(a)	**Current Assets**	**Rs.**
	Stock (12 Weeks)	1,38,462
	(Rs.6,00,000 × 12/52)	92,308
	Debtors (8 weeks)	2,30,770
	Rs. 6,00,000 × 8/52)	
Less:	**Current Liabilities**	46,154
	Creditors (4 weeks)	
	(6,00,000 × 4/52)	
	Net Working Capital (A–B)	1,84,616
Add:	10% for Contingencies	18,462
	Total Working Capital Required	

Working Notes

(i) Cost of Goods Sold

Sales = Rs. 1,00,000 × 8 = Rs. 8,00,000

Profits = Rs. 8,00,000 × 25% = Rs. 2,00,000

Cost of Sales = Rs. 8,00,000–2,00,000= Rs. 6,00,000

(ii) As, it is a trading concern; hence cost of sales is treated as purchases.

(iii) Profits have been ignored because profits may or may not be used as source of working capital.

Example 4.3: On 1st January, 2005 the Board of Directors of Paushak Limited wanted to know the amount of working capital required to meet the programme they have planned for the year. From the following information, prepare an estimate of working capital requirements.

Issued Share Capital	Rs. 2,00,000
8% Debentures	Rs. 50,000
Fixed Assets as on 1st January	Rs. 1,25,000

Production during the previous year was 60,000 units and it is proposed to maintain the same during 2005. The expected ratio of cost to selling price are:
Raw Materials 60%; direct wages 10% Overheads 20%.

The following further information is available:

a) Raw materials are expected to remain in the stores on an average for two months before being issued to the production unit.
b) Each unit of production is expected to be in process for one month.
c) Finished goods will stay in the warehouse awaiting dispatch to customers for approximately three months.
d) Credit allowed by creditors is two months from the date of delivery of raw materials.
e) Credit given to debtors is three months from the date of dispatch.
f) Selling price is Rs 5 per unit.

Solution:

Statement Showing working Capital Requirements

(a)	Current Assets	Rs.	Rs.
(i)	Stock of raw material (2 months) (Rs.15,000×2)		30,000
(ii)	Work-in-Progress (1 month)		
	Material (Rs.15,000×1)	15,000	
	Labour (Rs.2,500×1)	2,500	
	Overheads (Rs.5,000×1)	5000	22,500
(iii)	Stock of finished Goods (3 months)		
	Material (Rs.15,000×3)	45,000	
	Labour (Rs.2,500×3)	7,500	
	Overheads (Rs.5,000×3)	15,000	67,000
(iv)	Debtors (3 months)		
	Material (Rs. 15,000×3)	45,000	
	Labour (Rs. 2,500×3)	7,500	
	Overheads (Rs. 5,000×3)	15,000	67,000
			1,87,500
(B)	**Current Liabilities:**		
	Creditors for raw Material (2 months) Rs. 15,000×2)		30,000
	Net working Capital required (A–B)		**1,57,500**

Working Notes:

1) Debtors have been valued and calculated on sales basis which would be Rs. 75,000 ($60,000 \times 5 \times 3 \times 12$). Hence, working capital taking Current Assets at total value

	Rs.	
Working Capital required as per above statement	1,57,500	
Add: Increase in Debtors (Rs. 75,000–Rs.67, 500)		7,500
		1,65,000

2) Monthly amount of each element of cost is calculated as follows-
Total sales $60,000 \times 5$ = Rs. 3,00,000

(a) Raw Materials = $\frac{3,00,000 \times 60}{100 \times 12} = \text{Rs.}15,000$

(b) Direct Labour = $\frac{3,00,000 \times 10}{100 \times 12} = \text{Rs.}2,500$

(c) Overheads = $\frac{3,00,000 \times 20}{100 \times 12} = \text{Rs.}5,000$

3) It is assumed that labour and overhead in the beginning. Hence, full amount of labour and overhead is included in work-in-progress. If it is assumed that labour and overheads accrued evenly, half of the amount will be included in work-in-progress.

4) Additional capital required will be Rs. 35,500 (Rs. 1,57,500-1,25,000), because Rs. 1,25,000 is available from long-term sources (share capital debentures-Fixed assets)

☞ Check Your Progress 2

1) You are required to prepare for the Board of Directors of Suman Ltd. a statement showing the working capital needed to finance a level of activity of 5,200 units of output. You are given the following information:

Elements of Cost	Amount per unit (Rs.)
Raw Material	8
Direct Labour	2
Overheads	6
Total Cost	16
Profit	4
Selling Price	20

(i) Raw Materials are in stock, on an average one month, (ii) Materials are in process, on an average half a month, (iii) Finished Goods are in stock on an average 6 weeks, (iv) Credit allowed to Debtors is two months, (v) Lag in payment of wages is $1^{1/2}$ weeks, (vi) Assume 52 weeks in a year and 4 weeks in a month.

Cash in hand and at Bank is expected to be Rs. 7,300. You are informed that production is carried on evenly during the year and wages and overheads accrue evenly.

2) From the following information, you are required to estimate the net working capital:

	Cost Per unit (Rs.)
Raw Material	200
Direct Labour	100
Overhead (excluding Depreciation)	250
Total Cost	550

Estimated data for the forthcoming period are given below:

Raw Material in Stock	Average 6 weeks
Work-in-progress (assume 50% completion stage with full material consumption)	Average 2 weeks
Finished Goods in Stock	Average 4 weeks
Credit Allowed by Suppliers	Average 4 weeks
Credit Allowed to Debtors	Average 6 weeks
Cash at Bank Expected to be	Rs.75,000
Selling Price	Rs. 800 per unit
Output	52,000 units per annum.

Assume that production is sustained at an even pace during 52 weeks of the year. All sales are on credit basis.

c) **Projected Balance Sheet Method**

Under this method, estimates, of different assets (excluding cash) and liabilities are made taking into consideration the transactions in the ensuring period. Thereafter, a balance sheet is prepared based on these forecasts. Assets and liabilities are called 'Projected balance sheet'. The difference between assets and liabilities of this balance sheet is treated as shortage or surplus cash of that period. If the total liability is more than total assets, it represents excess cash, which is not required by the firm. The management may plan for its investment. On the contrary, if total assets are more than total liabilities, then it indicates the deficiency of working capital, which is to be arranged by the management either from bank overdraft or from other sources.

d) **Adjusted Profit and Loss Method**

In this method, estimated profit is calculated based on transactions of the ensuing period. Thereafter, increase or decrease in working capital is computed adjusting the estimated profit by cash inflows and cash outflows. It is like cash flow statement. A few banks in India use forms for computing working capital under this method. A specimen of such a form is given below.

Computation of Working Capital

	Rs.
Net Income	……..
Add: (i) Non-cash Items	……
Working Capital Provided Operations	… … … …
Add: (ii) Cash inflow Items	……..
Less: Cash Outflow items	.
Net Changes in Working Capital	……..

e) **Cash Forecasting Method**

In this method, estimate is made of cash receipts and payments in the ensuring period. The difference of these receipts and payments indicates deficiency or surplus of cash. The management formulates plans to procure the amount of deficit. This method, in a way, is a form of cash budget.

Example 4.4: Calculate the operating cycle and the working capital requirements from the following figures:

	Balance as at 1st January	Balance as at 31st December
	Rs.	Rs.
Raw Material	80,000	1,20,000
Work-in-Progress	20,000	60,000
Finished goods	60,000	20,000
Sundry Debtors	40,000	40,000
Wages and Manufacturing Expenses	-	2,00,000
Distribution and Other Expenses	-	40,000
Purchases of Materials	-	4,00,000
Total Sales	-	10,00,000

(i) The Company obtains a credit for 60 days from its suppliers.
(ii) All goods were sold for credit.

Solution:

Computation of Operating Cycle

(i) Material Storage Period:

$$= \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}}$$

$$= \frac{(Rs.80,000 + 1,20,000)/2}{Rs.3,60,000/365}$$

$$= \frac{(Rs.1,00,000)}{Rs.986.3} = 101.38\,\text{days}$$

Material Consumed = Opening Stock + Purchases – Closing Stock

= Rs. 80,000 + 4,00,000-1,20,000
= Rs. 3,60,000

(ii) Conversion or Processing Period

$$\frac{\text{Average Stock of Work – in – progress}}{\text{Daily Average Factory Cost}}$$

$$= \frac{(Rs.20,000 + 60,000)/2}{Rs.5,20,000/365}$$

$$= \frac{(Rs.40,000)}{Rs.1,424.65} = 28.07\,\text{days}$$

Factory Cost: **Rs.**

Opening Work-Progress	20,000
Material Consumed (as above)	3,60,000
Wages and Mfg. Expenses	2,00,000
	5,80,000
Less: Closing Work-in-Progress	60,000
	5,20,000

(iii) Finished Goods Storage Period

$$\frac{\text{Average Stock of Finished Good}}{\text{Daily Average Cost of Goods Sold}}$$

$$= \frac{(\text{Rs.}60{,}000 + 20{,}000)/2}{\text{Rs.}5{,}60{,}000/365}$$

$$= \frac{(\text{Rs.}40{,}000)}{\text{Rs.}1{,}534.25} = 26.07\text{days}$$

Cost of Goods sold **Rs.**

Opening Stock of Finished Goods	60,000
Factory Cost (as above)	5,20,200
	5,80,000
Less: Closing Stock of Finished Goods	20,000
	5,60,000

(iii) Debtors Collection period

$$= \frac{\text{Average Debtors}}{\text{Daily Average Sales}}$$

$$= \frac{(\text{Rs.}40{,}000 + 40{,}000)/2}{\text{Rs.}10{,}00{,}000/365}$$

$$= \frac{(\text{Rs.}40{,}000)}{\text{Rs.}2{,}739.7} = 14.6\,\text{days}$$

Computation of Working Capital Required

1. Operating Cycle Period = M+W+F+D-C
   = 101.38 +28.07+26.07+14.60-60
   = 110.12 or 110 days

2. Total Cost of Sales Rs

Cost of Goods Sold	5,60,000
Distribution and other Expenses	40,000
	6,00,000

3. Cash Working Capital $= C + \frac{OC}{N} \times CS$

$$= O + \frac{110}{365} \times \text{Rs.}6{,}00{,}000 = \text{Rs.}1{,}80{,}822$$

Example 4.5: Mr. Krishan wishes to commence a new trading business and gives the following information:

The total estimated sales in a year will be Rs. 12,00,000.

His expenses are estimated as fixed expenses of Rs. 2,000 per month plus variable expenses equal to five percent of this turnover.

He expects to fix a sale price for each product which will be 25 percent in excess of his cost of purchase.

He expects to turnover his stock four times in a year.

The sales and purchases will be evenly spread throughout the year. All sales will be for cash and purchases on credit, but he expects one month's credit for purchases.

He keeps cash in hand to meet one month's expenses.

Calculate: (a) His estimated profit for the year;
(b) His average working capital requirements.

Solution:

(a)

Estimated Profit of Mr. Krishan for the year

Sales		**Rs.**
		12,00,000
Less: Gross Profit $\left(12,00,000 \times \frac{25}{125}\right)$		2,40,000
Cost of Goods Sold		9,60,000
Gross Profit (as above)		2,40,000
Less: Expenses:		
Fixed (2000×12)	24,000	
		84,000
Variable $\left(12,00,000 \times \frac{5}{100}\right)$	60,000	1,56,000

(b) **Statement of Average Working Capital Requirements**

(A) Current Assets:		Rs.
(i) Stock		2,40,000
(ii) Turnover of Stock is 4 times		
(iii) Stock Turnover = $\frac{\text{Cost of Goods Sold}}{\text{Average stock at cost}}$		
Or $4 = \frac{\text{Rs.}9,60,000}{\text{Average Stock}}$		
So Average Stock = $\frac{\text{Rs.}9,60,000}{4} = \text{Rs.}2,40,000$		
(i) Cash		
To meet fixed expenses	2,000	
To meet variable expenses	5,000	7,000
$\left(12,00,000 \times \frac{5}{100} \times \frac{1}{12}\right)$		Nil
(ii) Debtors (as all the sales are for cash only)		2,47,000
		1,00,000
(B) Current Liabilities		
(i) Creditors [1 month/ (12,00,000x1/12)]		1,47,000
(ii) Working Capital Required (A-B)		

Total Purchases = Cost of Goods Sold + Closing Stock

(As it is a new business, there is no opening stock)

= Rs. 9,60,000 + 2,40,000 = Rs. 12,00,000.

Example 4.6: Manekchand Ltd. Plans to sell 30,000 units next year. The expected cost of goods sold is as follows:

	Rs. (Per units)
Raw Material	100
Manufacturing Expenses	30
Selling Administration And Finance Expanses	20
Selling Price	200

The duration of various stages of the operating cycle is expected to be as follows:

Raw Material Stage	2 month
Work in Progress	1 month
Fished Goods Stage	½ month
Debtors Stage	1 months

Assuming the monthly sales level of 2,500 units; estimate the gross working capital requirements if the desired cash balance is 5 % of the gross working capital requirement.

Solution:

Statement of Gross Working Capital Requirements

Current Assets:		**Rs.**	**Rs.**
(i)	Raw Material (2 months) (Rs. 2,500×100×2)	`	5,00,000
(ii)	Work in progress (1 month) Raw material (Rs. 2,500×100×1) Mfg. Expenses (Rs. 2,500×30×1)	2,50,000 75,500	3,25,000
(iii)	Finished good (1/2 months) Raw Material (Rs. 2,500×100×5) Mfg. Expenses (Rs. 2,500×30×.5)	1,25,000 37,500	1,62,500
(iv)	Debtors (1 month) (Rs. 2,500×150×1)		3,50,000
(v)	Cash		13,62,500
			71,711
	(5% of gross working capital i.e., 13,62,500×5/95)		14,34,211
	Gross Working Capital Required		

Working Notes:

1. Selling administration and finance expenses are not included in the value of closing stock of finished goods but added in the cost of sales for valuing debtors.

2. It is assumed that degree of completion of work-in-progress is 100% as regards materials, labour and overhead and as such material and manufacturing expenses for the full period are included in the cost of work-in-progress.
3. It is assumed that all sales are credit sales.
4. Profit has not been treated as source of working capital hence fully ignored.

☞ **Check Your Progress 3**

1) From the following particulars, calculate working capital adding 10% per annum for contingencies.

(a)	Average amount backed up for stocks: Stock of finished products Stock of materials and stores		 1,000 1,600
(b)	Average credit given: Home market 6 weeks credit Foreign market 1.5 week's credit		 62,400 15,600
(c)	Payment in Advance: Sales promotion expenses (Paid quarterly in advance)		 1,600
(d)	Lag in payment of wages and other expenses: Wages Materials and Stores Office Salaries Rent Other expenses	 1.5 weeks 1.5 months 0.5 months 6 months 1.5 months	 52,000 9,6000 12,480 2,000 9,600

2) M/s. ABC Limited have approached their bankers for their working capital requirements, who have agreed to sanction the same by retaining the margin as under.

Raw Material	20%	Finished Goods	25%
Stock-in-process	30%	Debtors	10%

From the following projections for 2004-2005, you are required to work out:

(i) The working capital required by the company and

(ii) The working capital limits likely to be approved by bankers Estimates for 2004-2005.

Annual Sales:	Rs.
Cost Production (including depreciation of Rs. 1,20,000	14,40,000
Raw Material Purchases	12,00,000
Monthly Expenditures	7,05,000
Anticipated Opening Stock of Raw Materials	25,000
Anticipated Closing Stock of Raw Materials	1,40,000
Inventory norms:	
Raw Materials	2 months
Work in progress	15 days
Finished Goods	1 months

The company enjoys a credit of 15 days on its purchase and allows one-month credit to its debtors. On sales orders the company has received an advance of Rs. 15,000.

You may assume that production is carried out evenly throughout the year and minimum cash balance desired to be maintained is Rs.10,000.

3) Bharat Company Ltd. sells goods in the home market only and earns a gross profit of 25 % on sales. For the year ending 31st Dec; 2005, the following figures are available.

	Rs.
Material used	1,12,500
Wages paid	90,000

Manufacturing expenses (including depreciation	1,35,000
Administrative expenses	30,000
Depreciation	15,000
Sales promotion expenses	15,000
Income Tax payable in four installments which falls in the next financial year	37,500
Sales	**4,50,000**

Other particulars are

1. Suppliers of materials provide two month's credit;
2. Wages are paid half month in arrear;
3. Manufacturing and administrative expenses are all cash expenses and are paid one month in arrear;
4. Sales promotion expenses are paid quarterly in advance;
5. Sales are made at one month's credit;
6. Company wishes to keep one month stock of raw materials and also of finished goods;
7. The Company believes in keeping Rs. 25,000 available with it including the overdraft limit of Rs. 12,500 not yet utilised by the Company.

You are required to ascertain the requirements of working capital for the year 2005.

4) A Performa cost sheet of a Company provides the following particulars:

Element of Cost	**Amount per unit Rs.**
Raw Materials	80
Direct Labour	30
Overhead	60
Total Cost	170
Profit	30
Selling Price	200

The following further particulars are available:

Raw materials are on stock for one month on an average. Materials are in process of half month on an average. Finished goods are in stock for one month on an average. Credit allowed by suppliers is one month. Credit allowed to debtors is two months. Lag in payment of wages is 2 weeks. Lag in payment of overhead expenses is one month. 25% of output is sold for cash. Cash in hand and at bank is expected to be Rs. 30,000.

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 overhead accrue similarly and a time period of 4 weeks and 52 weeks is equivalent to a month and a year respectively.

4.8 SUMMARY

Financial decisions are based on certain considerations the main being the cash flows, cost and liquidity. Short-term financial decisions or working capital decisions are

different with regard to quantum and frequency of cash flows. There are two concepts of working capital:

(i) Gross Working Capital

(ii) Net Working Capital.

The main characteristic of the current asset is that they change their form within one operating cycle. Working capital requirement is influenced by a variety of factors, the main among them is nature and size of business. There are various methods of calculating working capital requirement. In some the base figures are obtained from financial statements.

4.9 SELF-ASSESSMENT QUESTIONS/EXERCISES

1. Explain the concept of working capital. Are gross and net concepts of working capital exclusive? Discuss.
2. What is the importance of working capital for a manufacturing firm? What will be the repercussions if a firm has (a) paucity of working capital (b) excess working capital?
3. What is the concept of working capital cycle? What is meant by cash conversion cycle? Why are these concepts important in working capital management? Give an example to illustrate your point.
4. Briefly explain factors that determine the working capital needs of a firm.
5. How is working capital affected by (a) Sales, (b) Technology and Production Policy, and (c) Inflation? Explain.
6. Define working capital management. Why is it important to study the management of working capital as a separate area in financial management?
7. Do you recommend that a firm should finance its current assets entirely with short term financing? Explain your answer.
8. What methods do you suggest for estimating working capital needs? Illustrate your answer.
9. Explain the difference between Gross and Net Working Capital.
10. What is the operating cycle concept of working capital?
11. State the difference between fixed and variable working capital.
12. How is working capital affected by the nature of business?
13. Why is excess working capital dangerous?
14. Explain the concept of working capital. What are the constituents of working capital of a company?
15. What is operating cycle concepts or working capital? How will you determine the amount of working capital under this method? Explain with examples?
16. "Inadequate working capital is disastrous whereas redundant working capital is a criminal waste". Critically examine this statement.
17. What is the concept of "Working Capital"? What factors determine the needs of working capital and how is it measured?

18. What is meant by working capital forecasting? Briefly explain the techniques used in making such forecasts.

19. Write short notes on the following:
    (i) Operating Cycle of Working Capital
    (ii) Types of Working Capital.

Practical Questions

1. The following data has been taken from the financial records of Meenakshi Company Ltd.

Raw Material	Rs. 40 per units
Direct Labour	Rs. 20 per unit
Overheads	Rs. 5,40,000 (Total)

The following additional information is also available:

1. The management of the company is planning to manufacture 1,00,000 units in the coming year. The selling price per unit will be Rs. 125. There is perfect harmony between output and sales of the Company, which is maintained throughout the year.
2. The average storage period is 40 days for raw material and 30 days for finished goods.
3. The company sells goods to its customer on 30 days credit and purchase raw material on 60 days credit from its suppliers.
4. The duration of the production cycle in the Company is 20 days and the needed raw material is issued to the production at the beginning of each production cycle.
5. 20% of the average working capital is kept as extra cash for contingencies.

Assume 360 working days in the operating period, work out an estimate of the total requirements of working capital for the Company using Operating Cycle Method.

2. From the following data, compute the duration of the operating cycle and working capital requirements for each of the two years:

Average Stocks:	Year 1 (Rs.)	Year 2 (Rs.)
Raw Material	20,000	27,000
Work-in-progress	14,000	18,000
Finished Goods	21,000	24,000
Purchase	96,000	1,35,000
Cost of Goods Sold	1,40,000	1,80,000
Sales	1,60,000	2,00,000
Debtors	32,000	50,000
Creditors	16,000	18,000

Assume 360 days per year for computational purposes.

Forecasting Net Current Assets Methods

3. From the following information, you are required to estimate the working capital requirements of Mahesh Ltd.

Raw Material Cost	0.75 per units
Overheads	Rs. 15,000 per annum
Labour	581/2 p. per unit

Output and Sales	10,000 units per month
Selling Price	Rs. 5.00 per unit
Buffer Stocks to be carried	
Raw Materials	2 weeks production
Finished Goods	3 weeks supply

The debtors on an average take 2.25 month's credit. Raw Material is received in uniform deliveries daily and suppliers have to be paid at the end of the month when goods are received. Other creditors for overheads allow on an average 1 ½ months credit. Calculate the working capital required for February in the form, for presentation to the Board. For this purpose, you may assume that a month is a four-week period.

4. The Board of Directors of ABC Engineering Company Ltd. requests you to prepare a statement showing the working capital requirements forecast for an expected level of production of 22,000 tonnes. The following information is available for your computation.

Raw Material to remain in stock on an average	4 weeks
Processing Material in process	2 weeks
Permanent Material in process	200 tonnes
Finished Goods in Stock	6 weeks
Credit allowed to Customers	8 weeks
Expected ratio of material to sale price	72%
Wages and Overheads	22%
Selling Price per ton	Rs. 3,000

5. Prepare a working capital forecast from the given below information:

Issued Share Capital	Rs. 4,00,000
6% Debentures	Rs. 1,50,000
Fixed Assets	Rs. 3,00,000

Production during the previous year is 1-lac units. The same level of activity is intended to be maintained during the year. The expected ratios of cost to selling prices are:

Raw materials 50% Direct Wages 10% Overheads 25%. The inventory holding norms are as under:

Raw Material	2 month's Consumption
Stock-in-process	2 month's cost of production
Finished Goods	4 month's cost of sales

Besides sundry Creditors and Sundry Debtors are equivalent to 3 month's purchases and 3 months sales respectively. Selling price is Rs. 6 per unit. Both production and sales are in regular cycle and wages and overhead accrue evenly.

6. The Board of Directors of Nanak Engineering Company Private Limited requests you to prepare a statement showing the working capital requirements forecast for a level of activity of 1,56,000 units of production. The following information is available for your calculation:

Raw Material	90
Direct Labour	40

Overheads	75
	205
Profits	60
Selling Price	265

1) Raw Materials are in stock on an average for one month;
2) Materials are in process on an average two weeks;
3) Finished goods are in stock on an average one-month;
4) Credit allowed by suppliers one month;
5) Time lag in payment from debtors two months;
6) Lag in payment of wages is 1 ½ weeks; and
7) Lag in payment of overheads is one month

20% of the output is sold against cash. Cash in hand and at bank is expected to be Rs. 60,000. It is to be assumed that production is carried on evenly throughout the year, wages and overheads accrue similarly and time period of 4 weeks is equivalent to a month and 52 weeks a year.

7. The following data is available from the cost sheet of a Company.

	Cost per unit
Raw Material	50
Direct Labour	20
Overhead (including depreciation of Rs. 10)	40
Total Cost	110
Profit	20
Selling Price	130

Additional information:

Average raw material in stock is for one month. Average material in progress is for half month. Credit allowed by suppliers is one month, credit allowed to debtors is one month. Average time lag in payment of wages: 10 days; average time lag in payment of overheads 30 days. 25% of the sales are on cash basis. Cash balance expected to be Rs. 1,00,000. Finished goods lie in the warehouse for one month.

You are required to prepare a statement showing the working capital needed to finance a level of the activity of 50,000 units of output. Production is carried out evenly throughout the year and wages and overheads accrue similarly. State your assumptions if any, clearly.

4.10 SOLUTIONS / ANSWERS

Check Your Progress 1

Solution 1

Computation of Operating Cycle

1.	**Operating Period**		**Days**
	(i) Raw Material Storage Period		30
	(ii) Finished Stock Storage Period		15
	(iii) Processing or Conversion Period		30
	(iv) Debtors Collection Period		60
			135
Less:	Creditors Payment Period		40
			95
2.	Number of Operating Cycle per year	365/95 =	3.842
3.	Total Operating Expenses		Rs.
	Raw Material (1,00,000 × 10)		10,00,000

Labour (1,00,000 × 4)	4,00,000	
Overheads (1,00,000 × 4)	4,00,000	

4. Working Capital = $\frac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles}}$

$= \frac{\text{Rs.18,00,000}}{3.842 \text{ or } 365/95}$

Add: 1/3 for Contingencies	4,68,493
	1,56,164
Total Working Capital Required	6,24,657

Alternatively

$WC = C + \frac{OC}{N} \times CS$

$= 0 + \frac{95}{365} \times 18,00,000 = 4,68,493$

Add: 1/3 for Contingencies = 1,56,164

6,24,657

Solution 2:

Computation of Operating Cycle Period

1. Material Storage Period

$= \frac{\text{Average Stock of Raw Material}}{\text{Daily Average Consumption}}$

$= \frac{\text{Rs.32,000}}{\text{Rs.4,40,000}/365} = \frac{32,000}{1,205.48} = 27 \text{ days}$

2. Conversion Period

$\frac{\text{Average Stock of work} - \text{in} - \text{progress}}{\text{Daily Average Pr oduction Cost}}$

$\frac{\text{Rs.35,000}}{\text{Rs.10,00,000}/365} = \frac{35,000}{2,739.73} = 13 \text{ days}$

3. Finished Goods Storage Period

$\frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Sales}}$

$\frac{\text{Rs.26,000}}{\text{Rs.10,50,000}/365} = \frac{26,000}{2,876.7} = 9 \text{ days}$

4. Debtors Collection Period:

$= \frac{\text{Average Debtors}}{\text{Sales per day}}$

$= \frac{\text{Rs.48,,000}}{\text{Rs.16,00,000}/365} = \frac{48,000}{4,383.56} = 11 \text{ days}$

1.	Operating Cycle Period	Days
	(i) Material Storage Period	27
	(ii) Conversion Period	13
	(iii) Finished Goods Storage Period	9
	(iv) Debtors Collection Period	11/60
	Less: Creditors Payment Period	16/44

2. Number of Operating Cycle Per year 365/44 8.3

3. Total Operating Expenses Rs. 10,50,000

4. Working Capital Required $= \frac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles in a Year}}$

$= \frac{\text{Rs.10,50,000}}{\text{Rs.8.3}}$

$=$ Rs. 1,26,506

Alternatively

$$WC = C + \frac{OC}{N} \times CS$$

$$= 0 + \frac{44}{365} \times \text{Rs.10,50,000}$$

$$= \text{Rs.1,26,575}$$

Note: A little difference between the two methods is due to approximation.

Check Your Progress 2

Solution 1:

Statement Showing Working Capital Requirements

(A)	Current Assets:	Rs.	Rs.
	(i) Stock of Raw Materials (4 weeks):		3,200
	(ii) Work in process (2 weeks):		
	Raw Materials (Rs.800 × 2)	1,600	
	Labour (Rs. 200 × 1)	200	
	Overheads (Rs.600 × 1)	600	2,400
	(iii) Stock of finished Goods (6 weeks):		
	Raw Materials (Rs.800 × 6)	4,800	
	Labour (Rs 200 × 6)	1,200	
	Overheads (Rs.600 × 6)	3,600	
			9,600
	(iv) Debtors (8weeks):		
	Raw Materials (Rs.800 × 8)	6,400	
	Labour (Rs.200 × 8)	1,600	12,800
	Overheads (Rs.600 × 8)	4,800	7,300
	(v) Cash as per estimate		35,300
	(B) Less: Current Liabilities:		
	(i) Creditors (4 Weeks)	3,200	
	(ii) Lag in payment of wages ($1^{1/2}$ Weeks):		
	Labour (Rs.200 × $1^{1/2}$)	300	3,500
	Working Capital Required (A-B)		31,800

Working Notes:

(1) Weekly amount of each element of costs calculated as follows:
Total Sales for of the year = 5,200 × Rs.20 = Rs.1,04,000

(i) Raw Material $= \frac{1,04,000}{52 \times 20} = \text{Rs.800}$

(ii) Direct Labour = $\frac{1,04,000 \times 2}{52 \times 20} = \text{Rs.}200$

(iii) Overhead = $\frac{1,04,000 \times 6}{52 \times 20} = \text{Rs.}600$

Alternative Method

Annual Production = 5,200 units
Weekly production = 5,200/52 = 100 units
Material = 100 × Rs.8 = Rs.800
Labour = 100 × Rs.2 = Rs.200
Overhead = 100 × Rs.6 = Rs.600

(2) Debtors are calculated at cash cost of sales.

(3) It has been assumed that material is issued at the commencement in each production cycle, but labour and overheads are incurred in the process of production. Therefore, half of the amount (one week) is invested in the process.

(4) Profit may be or may not be a source of working capital. Payment of Income Tax and Dividend are adjusted in these profits, therefore, profits have not been considered.

Solution 2

Computation of Net Working Capital

(A)	**Current Assets**	**Rs.**	**Rs.**
	(i) Stock of raw Materials (6 weeks)		
	(Rs. 52,000 × 200 × 6/52)		12,00,000
	(ii) Work-in-progress (2 weeks)		
	Raw Materials (Rs.52, 000 × 200 × 2/52)	4,00,000	
	Direct Labour (Rs.52,000 × 100 × 1/52)	1,00,000	
	Overheads (Rs.52, 000 × 250 × 1/52)	2,50,000	7,50,000
	(iii) Stock of Finished Goods (4 weeks)		
	(52,000 × 800 × 4/52)		22,00,000
	(iv) Debtors (6 weeks)		
	(52,000 × 800 × 6/52)		48,00,000
	(v) Cash at Bank		75,000
			90,25,000
(B)	Current Liabilities		
	(ii) Creditors (4 Weeks)		
	(iii) (52,000 × 400 × 4/52)		8,00,000
(c)	Net Working Capital (A-B)		82,25,000

Working Notes:

(i) Debtors are taken at selling price as the amount of net working capital is to be calculated. If working capital requirements are to be calculated, then debtors should be taken at cash cost.

(ii) It is assumed that there is no time lag in payment of overheads.

Check Your Progress 3

Solution 1

Computation of "Working Capital Requirements"

(A) Current Assets	**Rs.**	**Rs.**

(i) Stock of Material and Stores		
(ii) Stock of finished Goods		
(iii) Books Debts (a) Home (62,400×6/52)	7,200	
(b) Foreign (15,600×1.5/52)	450	
(iv) Advance Payment (1,600×3/12)		
(B) Current Liabilities		
(i) Creditors for Stores and Materials (9,600×1.5/12)		
(ii) Outstanding expenses:		
Wages (52,000×1.5/52)	1,500	
Office Salaries (12,480×.5/12)	520	
Rent (2,000×6/12)	1,000	
Other Expenses (9,600×1.5/12)	1,200	
© Net Working Capital (A-B)	5,420	
Add: 10% Contingency Allowance	5,230	
Average amount of working Capital required	523	
	5,753	

Working notes:

(i) For calculation purposes, 52 weeks or 12 months in a year are assumed.
(ii) In the absence of cash cost of current assets, the actual working capital will differ from that of amount computed above.

Solution 2

(i) Statement Showing Working Capital Requirements

(A) Current Assets	**Rs.**	**Rs.**
(i) Cash Balance		10,000
(ii) Stock of Raw Materials (2 months) (Rs. 7,20,000×2/12)		1,20,000
(iii) Stock of Work-in-progress (15 days) (Rs. 10,80,000×.5/12)		45,000
(iv) Stock of Finished Goods (1months) (Rs. 10,80,000×1/12)		90,000
(v) Debtors (1 month) (Rs. 10,80,000×1/12)		90,000
(vi) Monthly Expenditure		25,000
		3,80,000
(B) Current Liabilities		
(i) Creditors (15 days) (Rs. 7,05,000×.5/12)	29,375	
(ii) Advance received from Debtors	15,000	44,375
Net Working Capital Required (A) – (B)		3,35,625

(ii) **Working capital limits likely to be approved by bankers.**

	Particulars	**Required by Co. (Rs.)**	**Margin (Rs.)**	**Allowed by bankers (Rs)**
A.	Raw Materials	1,20,000	20% = 24,000	96,000
B.	Work-in-Progress	45,000	30% = 13,500	31,500

C.	Finished Goods	90,000	25% = 22,500	67,500
D.	Debtors	90,000	10% = 9,000	81,000
E.	Expenses	25,000		NIL
	Working Capital Likely to be approved by Bankers.			2,76,000

Working Notes:

Rs.

A	Calculation of raw material consumed:	
	Opening Stock of Raw Material	1,40,000
	Add: Purchases	7,05,000
		8,45,000
	Less: Closing Stock of Raw Material	1,25,000
	Annual Consumption	7,20,000
B	Cash cost of annual production	Rs.
	Cost of production as given	12,00,000
	Less: Depreciation	1,20,000
		10,80,000

(iii) It is assumed that there is neither opening stock of finished goods nor closing stock. Hence, cost of sales is taken to Rs. 10,80,000 after deducting depreciation.

Solution 3

A	**Current Assets**		Rs.
	(i)	Debtors (cash cost of goods sold i.e. (3,67,500×2/12)	30,625
	(ii)	Prepayments: Sales Promotion Expenses (15,000×3/12)	3,750
	(iii)	Stock of Raw Materials (Rs. 1,12,500×1/12)	9,375
	(iv)	Stock of finished good (Rs. 3,22.500×12)	26,875
	(V)	Cash in hand	25,000
		Total	**956,25**
B		**Current Liabilities**	
	(i)	Sundry Creditors (Rs. 1,12,500×2/12)	18,750
	(ii)	Outstanding Expenses:	
		(a) Wages (Rs. 90,000×5/12)	3,750
		(b) Mfg. Expenses (Rs. 1,20,000×1/12)	10,000
		(c) Administration Expenses (Rs. 30,000×1/12)	2,500
	(iii)	Bank Overdraft	12,500
		Total	**47,500**
C		Net Working capital Required (A-B)	**48,125**

Working Notes:

(i) **Cash Cost of Production and Total Cost is Calculated as under:**

	Rs.
Sales	4,50,000
Less: Gross Profit @ 25% on sales	1,12,500
	3,37,500
Less: Depreciation	15,000

Cash Production Cost	3,22,000
Add: Administration Expenses	30,000
Sales Promotion Expenses	15,000
Total Cash Cost	3,67,500
Or	
Material Consumed	1,12,500
Wages Paid	90,000
Cash Mfg. Expenses	1,20,000
Cash Production Cost	3,22,500
Add: Administration Expenses	30,000
Sales Promotion Expenses	15,000
Total Cash Cot	3,67,500

(ii) Debtors have been calculated at cash cost.

(iii) Income tax has been ignored because profits are not treated as source of working capital, while income tax is paid out of profits.

Solution 4

Computation of Working Capital Requirement

A	Current Assets:		Rs.
	(i)	Stock of Materials (1 months) (1,04,000 × 80 × 4/52)	6,40,000
	(ii)	Work-in-progress (1/2 months)	
		Materials Cost (1,04,000 × 80 × 2/52)	3,20,000
		Labour Cost (1,04,000 × 30 × 1/52)	60,000
		Overheads (1,04,000 × 60 × 1/52)	1,20,000
	(iii)	Finished Goods (1 months)	
		Material Cost (1,04,000 × 80 × 4/52)	6,40,000
		Labour Cost (1,04,000 × 30 × 4/52)	2,40,000
		Overheads (1,04,000 × 60 × 4/52)	4,80,000
	(iv)	Debtors (2 months)	20,40,000
		(78,000 × 70 × 8/52)	30,000
	(v)	Cash Balance	45,70,000
B		**Current Liabilities**	
	(i)	Creditors for Material (1 months) (1,04,000 × 80 × 4/52)	6,40,000
	(ii)	Outstanding Expenses	
		(a) Overheads (1 months) (1,04,000 × 60 × 4/52)	4,80,000
		(b) Wages (2 weeks) (1,04,000 × 30 × 2/52)	1,20,000
			12,40,000
C		**Estimated Requirements of Working Capital (A-B)**	33,30,000

Working Notes:

(ii) 25% of production i.e 26,000 units are sold for cash. Hence credit sales are 78,000 units. The cash cost of debtors is calculated on these units.

(iii) It is assumed that full material is issued in the beginning and labour and overhead accrue evenly. Therefore, their 50% (one week) amount is included in WIP.

(iv) Profit on cash as well as on credit sales may or may not be the source of working capital. Income tax and dividends paid are to be adjusted from these profits. Hence, profits are ignored.

(v) All the overheads are assumed to be variable. Working capital will be reduced by the amount of depreciation. In absence of these data, estimates cannot be accurate.

(vi) It is assumed that stock of raw material and finished goods is maintained on the basis of goods produced.

UNIT 1 CASH AND TREASURY MANAGEMENT

Structure **Page Nos.**

1.0 INTRODUCTION

Cash is an important current asset for the operations of business. Cash is the basic input that keeps business running continuously and smoothly. Too much cash and too little cash will have a negative impact on the overall profitability of the firm as too much cash would mean cash remaining idle and too less cash would hamper the smooth running of the operations of the firm. Therefore, there is need for the proper management of cash to ensure high levels of profitability. Cash is money, which can be used by the firm without any external restrictions. The term cash includes notes and coins, cheques held by the firm, and balances in their (the firms) bank accounts.

It is a usual practice to include near cash items such as marketable securities and bank term deposits in cash. The basic characteristics of near cash items is that, they can be quickly and easily converted into cash without any transaction cost or negligible transaction cost.

In the recent years we have witnessed an increasing volatility in interest rates and exchange rates which calls for specialised skills known as Treasury Management. Recent years have also witnessed an expanding economy due to which there is an increased demand of funds from the industry.

1.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the motives for holding cash;
- prepare cash budget;
- understand how surplus cash is invested;
- understand how to reduce collection float, and
- understand the role and function of treasury management.

1.2 FACETS OF CASH MANAGEMENT

Cash management is concerned with the management of:

- Cash inflows and outflows of the firm
- Cash flows within the firm
- Cash balances (financing deficit and investing surplus).

The process of cash management can be represented by the cash management cycle as shown in *Figure 1.1*.

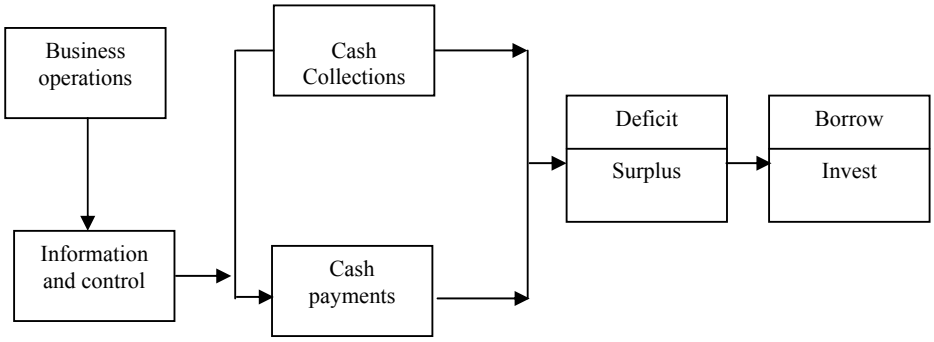

Figure 1.1: Cash Management Cycle

Sales generate cash which is used to pay for operating activities. The surplus cash has to be invested while deficit has to be borrowed. Cash management seeks to accomplish this cycle at minimum cost. At the same time it also seeks to achieve liquidity and control. Cash management assumes more importance than other current assets because cash is the least productive asset that a firm holds; it is significant because it is used to pay the firm's financial obligations. The main problem of cash management arises due to the difference in timing of cash inflows and outflows. In order to reduce this lack of synchronisation between cash receipts and payments the firm should develop appropriate strategies for cash management, encompassing the following:

- **Cash planning**: Cash inflows and outflows should be planned. Estimates regarding cash outflows and inflows for the planning period should be made to project cash surplus or deficit. Cash budget should be prepared for this purpose.

- **Managing cash flows**: Cash flows should be managed in such a way, that it, accelerates cash inflows and delays cash outflows as far as possible.

- **Optimum cash level**: The firm should decide about the optimum cash balance, which it should maintain. This decision requires a trade of between the cost of excess cash and the cost of cash deficiency.

- **Investing surplus cash and financing deficit**: Surplus cash should be invested in short term instruments so as to earn profits as well as maintain liquidity. Similarly, the firm should also plan in advance regarding the sources to finance short term cash deficit.

The cash management system design is influenced by the firm's products organisation structure, the market, competition and the culture in which it operates. Cash management is not a stand-alone function but it requires close coordination, accurate and timely inputs from various other departments of the organisation.

1.2.1 Motives for Holding Cash

The firm's need to hold cash may be attributed to the three motives given below:

- The transaction motive
- The precautionary motive
- The speculative motive.

Transaction Motive: The transaction motive requires a firm to hold cash to conduct its business in the ordinary course and pay for operating activities like purchases, wages and salaries, other operating expenses, taxes, dividends, payments for utilities etc. The basic reason for holding cash is non-synchronisation between cash inflows and cash outflows. Firms usually do not hold large amounts of cash, instead the cash is invested in market securities whose maturity corresponds with some anticipated payments. Transaction motive mainly refers to holding cash to meet anticipated payments whose timing is not perfectly matched with cash inflows.

Precautionary Motive: The precautionary motive is the need to hold cash to meet uncertainties and emergencies. The quantum of cash held for precautionary objective is influenced by the degree of predictability of cash flows. In case cash flows can be accurately estimated the cash held for precautionary motive would be fairly low. Another factor which influences the quantum of cash to be maintained for this motive is, the firm's ability to borrow at short notice. Precautionary balances are usually kept in the form of cash and marketable securities. The cash kept for precautionary motive does not earn any return, therefore, the firms should invest this cash in highly liquid and low risk marketable securities in order to earn some returns.

Speculative Motive: The speculative motive refers to holding of cash for investing in profit making opportunities as and when they arise. These kinds of opportunities are usually prevalent in businesses where the prices are volatile and sensitive to changes in the demand and supply conditions.

1.2.2 Cash Planning

Firms require cash to invest in inventory, receivables, fixed assets and to make payments for operating expenses, in order to increase sales and earnings and ensure the smooth running of business.

In the absence of proper planning the firm may face two types of situations: i) Cash deficit, and ii) Cash Surplus. In the former situation the normal working of the firm may be hampered and in extreme cases this type of situation may lead to liquidation of the firm. In the latter case the firm having surplus cash may be losing out on opportunities of earning good returns, as the cash is remaining idle. In order to avoid these types of conditions the firms should resort to cash planning. Cash planning is a technique to plan and control the use of cash. It involves anticipating future cash flows and cash needs of the firm. The main objective of cash planning is to reduce the possibility of idle cash (which lowers the firms profitability) and cash deficits (which can cause the firms failure). Cash planning involves developing a projected cash statement from a forecast of cash inflows and outflows for a given period. These forecasts are based on present operations or anticipated future operations. The frequency of cash planning would depend upon the nature and complexity of the firms operations. Usually large firms prepare daily and weekly forecasts whereas medium and small firms prepare monthly forecasts.

Cash Forecasting and Budgeting

A cash budget is one of the most significant devices to plan and control cash receipts and payments. In preparation of a cash budget the following points are considered.

- Credit period allowed to debtors and the credit period allowed by creditors to the firm for goods and services.

- Payment of dividends, taxes etc., and the month in which such payments are to be made.
- Non-consideration of non-cash transactions (Depreciation). These type of transactions have no impact on cash flow.
- Minimum cash balance required and the amount of credit/overdraft limit allowed by the banks.
- Plan to deal with cash surplus and cash deficit situations.
- Debt repayment (time and amount).

Figure 1.2 highlights the cash surplus and cash shortage position over the period of cash budget for preplanning to take corrective and necessary steps.

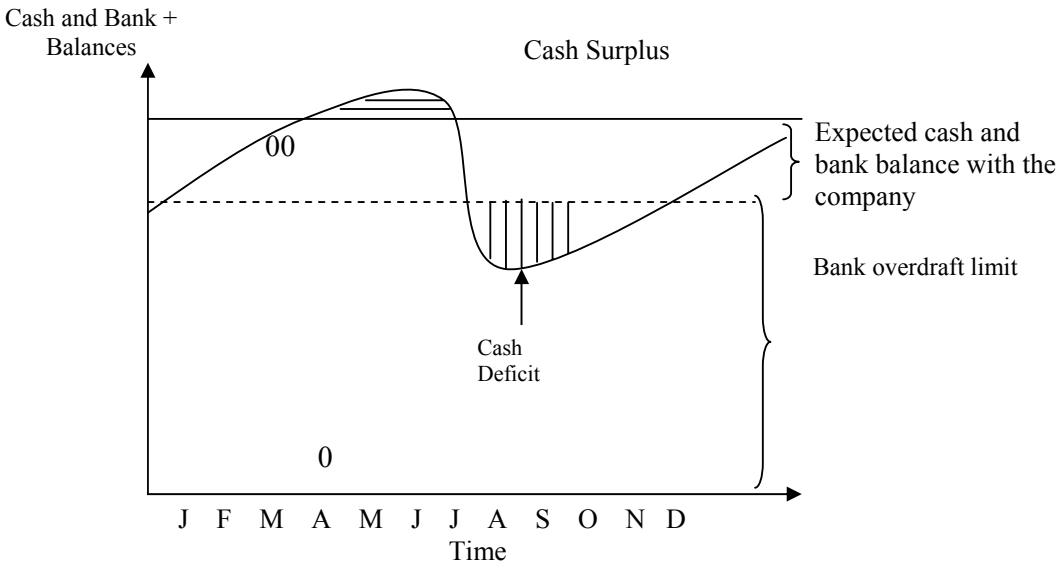

Figure 1.2: Cash surplus and cash deficit situations

1.2.3 Determining Optimum Cash Balance

One of the primary responsibilities of the financial manager is to maintain a sound liquidity position for the firm so that the dues are settled as and when they mature. Apart from this the finance manager has to ensure that enough cash is available for the smooth running of operating activities as well as for paying of interest, dividends and taxes. In a nut shell there should be availability of cash to meet the firm's obligation as and when they become due. The real dilemma which the finance manager faces is to decide on the quantum of cash balance to be maintained in such a way that at any given point of time there is neither cash deficit nor cash surplus. Cash is a non-earning asset; therefore, cash should be maintained at the minimum level. The cost of holding cash is the loss of interest/return had that cash been invested profitably. The cost of surplus cash is the cost of interest/opportunities foregone. The cost of shortage/deficit of cash is measured by the cost of raising funds to meet the deficit or in extreme cases the cost of bankruptcy, restructuring and loss of goodwill. Cash shortage can result in sub-optimal investment decisions and sub-optimal financing decisions.

The firm should maintain optimum – just enough neither too much nor too little cash balance. There are some models used to calculate the optimum cash balance that a firm ought to maintain. But the most widely known model is **Baumol's** model. It is chiefly used when cash flows are predictable.

Optimum Cash Balance: Baumol's Model

The **Baumol Model** (1952) considers cash management problem as similar to inventory management problem. As such the firm attempts to minimise the total cost,

which is the sum of cost of holding cash and the transaction cost (cost of converting marketable securities to cash). The **Baumol model** is based on the following assumptions:

- the firm is able to forecast its cash need with certainty,
- the opportunity cost of holding cash is known and it does not change over time, and
- the transaction cost is constant.

Let us assume that the firm sells securities and starts with a cash balance of **C** rupees. Over a period of time this cash balance decreases steadily and reaches zero. At this point the firm replenishes its cash balance to **C** rupees by selling marketable securities. This pattern continues over a period of time. Since the cash balance decreases steadily therefore the average cash balance is C/2. This pattern is shown in *Figure 1.3*.

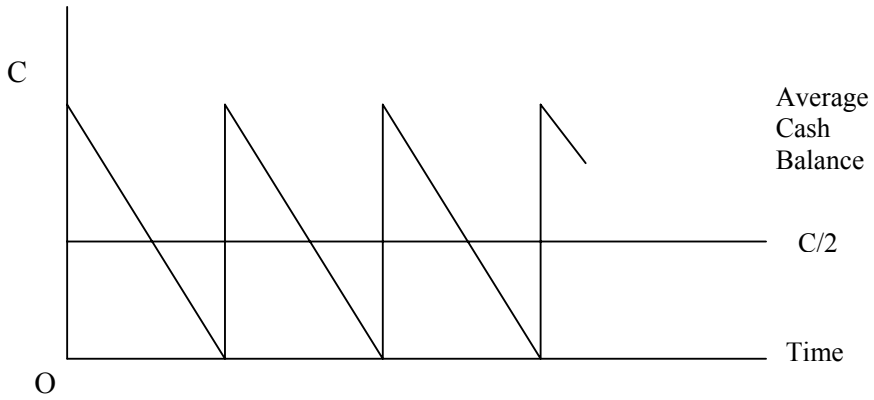

Figure 1.3: Pattern of Cash Balance: Baumol's Model

The firm incurs a holding cost for maintaining a cash balance. It is an opportunity cost, that is the return foregone on marketable securities. If the opportunity cost is I, then the firm's holding cost for maintaining an average cash balance is as follows:

$$\text{Holding Cost} = I\,(C/2).$$

The firm incurs a transaction cost whenever it converts its marketable securities to cash. Total number of transactions during the year would be the total fund requirement T divided by the cash balance C i.e., T/C. Since per transaction cost is assumed to be constant and if per transaction cost is B the total transaction cost would be B (T/C).

The total cost may be expressed as:

$$TC = \underbrace{I\,(C/2)}_{\text{Holding cost}} + \underbrace{B\,(T/C)}_{\text{Transaction cost}}$$

where

C = Amount of marketable securities converted into cash per cycle
I = Interest rate earned on marketable securities
T = Projected cash requirement during the period
TC = Total cost or sum of conversion and holding costs.

The value of C which minimises TC may be found from the following equation

$$C^* = \sqrt{\frac{2bt}{I}}$$

The above equation is derived as follows:

Finding the first derivative of total cost function with respect to C.

$$\frac{dTC}{dC} = \frac{I}{2} - \frac{bT}{c^2}$$

Setting the first derivative equal to zero, we obtain

$$\frac{T}{2} - \frac{bT}{c^2} = 0$$

Solving for C

$$C^* = \sqrt{\frac{2bt}{I}}$$

One can verify for second derivative condition ensuring C* to be minimized.

Example 1.1: M/s Sunrise Industries estimates its total cash requirement at Rs. 20 million for the next year. The company's opportunity cost fund is 15 per cent per annum. The company will have to incur Rs. 150 per transaction when it converts its short term securitites to cash. Determine the optimum cash balance. What is the total annual cost of the demand for optimum cash balance? How many deposits will have to be made during the year?

Solution:

$$C^* = \sqrt{\frac{2bT}{I}}$$

$$C^* = \sqrt{\frac{2(150)(2,00,000,00)}{.15}}$$

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

The annual cost will be:

$$TC = I\,(C/2) + B\left(\frac{T}{C}\right)$$

$$= 0.15\left(\frac{2,00,000,00}{2}\right) + 150\left(\frac{2,00,000,00}{2,00,000}\right)$$

$$= 15,000 + 15,000$$

$$= \text{Rs. } 30,000$$

In this financial year therefore, the company would have to make 100 conversions.

Short Term Cash Forecasts

The important objectives of short-term cash forecast are:

- determining operating cash requirement
- anticipating short term financing
- managing investment of surplus funds.

The short-term cash forecast helps in determining the cash requirement for a predetermined period to run a business. In the absence of this information the finance manager would not be able to decide upon the cash balances to be maintained. In addition to this the information given earlier would also be required to tie up with the financing bank in order to meet anticipated cash shortfall as well as to draw strategies to invest surplus cash in securities with appropriate maturities. Some of the other purposes of cash forecast are:

- planning reduction of short and long term debt
- scheduling payments in connection with capital expenditure programmes
- planning forward purchase of inventories
- taking advantage of cash discounts offered by suppliers, and
- guiding credit policy.

1.3 METHODS OF CASH FLOW BUDGETING

Cash budget is a detailed budget of income and cash expenditure incorporating both revenue and capital items. For control purposes the year's budget is generally phased into smaller periods e.g., monthly or quarterly. Since the cash budget is concerned with liquidity it must reflect changes in opening and closing balances of debtors and creditors. It should also focus on other cash outflows and inflows. The cash budget shows cash flows arising from the operational budgets and the profit and asset structure. A cash budget can be prepared by considering all the expected receipts and payments for budget period. All the cash inflow and outflow of all functional budgets including capital expenditure budgets are considered. Accruals and adjustments in accounts will not affect the cash flow budget. Anticipated cash inflow is added to the opening balance of cash and all cash payments are deducted from this to arrive at the closing balance of cash.

Format of Cash Budget

Period : First Quarter of 2005

Particulars	Months		
	Jan.	Feb.	March
	Rs.	Rs.	Rs.
Balance b/d			
Receipts:			
Cash Sales	…….	…….	…….
Cash collected from Debtors	…….	…….	…….
Calls on Shares and Debentures	…….	…….	…….
Sales of Investments	…….	…….	…….
Cash Available (A)	…….	…….	…….
Payments:			
Cash Purchases	…….	…….	…….
Payment to Creditors	…….	…….	…….
Wages and Salaries	…….	…….	…….
Expenses paid	…….	…….	…….
Dividend and Tax paid	…….	…….	…….
Repayment of Loans	…….	…….	…….
Purchase of Fixed Assets	…….	…….	…….
Total Payments (B)	…….	…….	…….
Balance c/d (A-B)	…….	…….	…….

☞ Check Your Progress 1

1) ABC Co. wishes to arrange overdraft facilities with its bankers during the period April to June of a particular year, when it will be manufacturing mostly for stock. Prepare a Cash-Budget for the above period from the following data, indicating the extent to which the company would require the facilities of the bank at the end of each month:
(a)

Month	Sales Rs.	Purchases Rs.	Wages Rs.
February	1,80,000	1,24,800	12,000
March	1,92,000	1,44,000	14,000
April	1,08,000	2,43,000	11,000
May	1,74,000	2,46,000	10,000
June	1,26,000	2,68,000	15,000

(b) 50% of the credit sales are realised in the month following sales and remaining 50% sales in the second month following. Creditors are paid in the following month of Purchase.

(c) Cash in the Bank on 1st April (estimated) Rs. 25,000.

2) A company is expecting Rs. 25,000 cash in hand on 1st April 2005 and it requires you to prepare an estimate of cash position during the three months, April to June 2005. The following information is supplied to you.

Month	Sales Rs.	Purchase Rs.	Wages Rs.	Expenses Rs.
February	70,000	40,000	8,000	6,000
March	80,000	50,000	8,000	7,000
April	92,000	52,000	9,000	7,000
May	1,00,000	60,000	10,000	8,000
June	1,20,000	55,000	12,000	9,000

Other Information: (a) Period of credit allowed by suppliers is two months; (b) 25% of sale is for cash and the period of credit allowed to customers for credit sale is one month; (c) Delay in payment of wages and expenses one month; (d) Income tax Rs. 25,000 is to be paid in June 2005.

3) From the following forecast of income and expenditure prepare a cash Budget for three months ending 30th November. The Bank Balance on 1st September is Rs. 3,000.

Month	Sales Rs.	Purchase Rs.	Wages Rs.	Factory Exp.	Expenses Rs.
July	24,000	12,000	1,680	1,170	3,000
August	22,950	12,600	1,740	1,230	3,600
September	23,400	11,550	1,740	1,260	4,200
October	2,000	11,250	170	1,530	4,800
November	28,500	13,200	1,770	1,800	3,900

Other Information : (i) A sales commission @ 5% on sales which is due in the month following the month in which sales dues are collected is payable in addition to office expenses; (ii) Fixed Assets worth Rs. 19,500 will be purchased in September to be paid for in October; (iii) Rs. 5,000 in respect of debenture interest will be paid in October; (iv) The period of credit allowed to customers is two months and one month's credit is obtained from the suppliers of goods; (v) Wages are paid on an average fortnightly on 1st and 16th of each month in respect of dues for periods ending on the date preceding such days; (vi) Expenses are paid in the month in which they are due.

1.4 INVESTING SURPLUS CASH

The demand for working capital fluctuates as per the level of production, inventory, debtor's, creditors etc. The working capital requirements is not uniform throughout the year due to the seasonality of the product being manufactured and business cycles. Apart from this, the working capital requirement would also depend upon the demand of the product and demand-supply situation of the raw material. Interplay of all these variables would determine the need for working capital at any point of time.

In situations where the working capital requirement is reduced, it results in excess cash. This excess cash may be needed when the demand picks up. The firms may hold this excess cash as buffer to meet unpredictable financial needs. Since this excess cash does not earn any return the firms may invest this cash balance in marketable securities and other investment avenues.

Since this excess cash balance is available only for a short period of time, it should be invested in highly safe and liquid securities. The three basic features – safety, maturity and marketability should be kept in mind while making investment decisions

regarding temporary surplus cash. Here safety implies that the default risk (viz., payment of interest and principal amount on maturity) should be minimum. Since the prices of long-term securities are more sensitive to interest rate changes as compared to short-term securities the firms should invest in securities of short-term maturity. Marketability refers to convenience, speed and transaction cost with which a security or an investment can be converted into cash.

Types of Short Term Investment Opportunities

The following short-term investment opportunities are available to companies in India to invest their temporary cash surplus.

a) **Treasury Bills:** Treasury Bills are short-term government securities, they are sold at a discount to their face value and redeemed at par on maturity. They are highly liquid instruments and the default risk is negligible.

b) **Commercial Papers:** Commercial papers are short term, unsecured securities issued by highly creditworthy and large companies. The maturity of these instruments ranges from 15 days to one year. These instruments are marketable hence they are liquid instruments.

c) **Certificate of Deposits:** Certificate of Deposits are papers issued by banks acknowledging fixed deposits for a specified period of time, they are negotiable instruments, this makes them liquid.

d) **Bank Deposits:** Firms can deposit excess/surplus cash in a bank for a period of time. The interest rate will depend upon the maturity period. This is also a liquid instrument in the sense that, in case of premature withdrawal only a part of interest earned has to be foregone.

e) **Inter-corporate Deposit:** Companies having surplus cash can deposit its funds in a sister or associate company or to other companies with high credit standing.

f) **Money Market Mutual Funds:** Money market mutual funds invest in short term marketable securities. These instruments have a minimum lock in period of 30 days and returns are usually two percent above that of bank deposits with the same maturity.

1.5 CASH COLLECTION AND DISBURSEMENTS

Once the cash budget has been prepared and appropriate net cash flows established the finance manager should ensure that there does not exist a significant deviation between projected and actual cash flows. The finance manager should expedite cash collection and control cash disbursement. There are two types of floats, which would require the attention of finance managers.

1) **Collection Float:** Collection float refers to the gap between the time, payment is made by the customer/debtor and the time when funds are available for use in the company's bank account. In simple words it is the amount tied up in cheques and drafts that have been sent by the customers, but has not yet been converted into cash. The reasons for this type of collection float are:

- The time taken in postal transmission
- The time taken to process cheques and drafts by the company, and
- The time taken by banks to clear the cheques.

To reduce this float companies can use various techniques, which are as follows:

a) **Concentration Banking:** When the customers of the company are spread over wide geographical areas then instead of a single collection centre the company opens collection centres at the regional level. The customers are instructed to remit payments to their specific regional centres. These regional centres will open bank accounts with the branches of banks where it has collection potential. These branches will telegraphically or electronically transfer the collected amount to the Head Office bank account. This system accelerates cash inflows.

b) **Lock Box System:** In this system, the customers are advised to mail their payments to a post office box hired by the firm for collection purposes near their area. The payments are collected by local banks who are authorised to do so. They credit the payments quickly and report the transaction to the head office.

c) **Zero Balance Account:** In this type of account any excess cash is used to buy marketable securities. Excess cash is the balance remaining after the cheques presented against this account are cleared. In case of shortage of cash marketable securities are sold to replenish cash.

d) **Electronic Fund Transfer:** Through electronic fund transfer the collection float can be completely eliminated the other benefit of electronic fund transfer is instant updation of accounts and reporting of balances as and when required without any delay.

2) **Payment Float:** Cheques issued but not paid by the bank at any particular time is called payment float. Companies can make use of payment float, by issuing cheques, even if it means as per books of account an overdraft beyond permissible bank limits. The company should be very careful in playing this float in view of stringent provisions regarding the dishonouring of cheques, loss of reputation etc.

1.6 TREASURY MANAGEMENT

Treasury management is defined as "the corporate handling of all financial matters, the generation of external and internal funds for business, the management of currencies and cash flows and the complex strategies, policies and procedures of corporate finance".

In today's exceptionally volatile financial markets and complex business environment, successful companies are directing their efforts aggressively to strengthen their treasury management strategy and tactics for accelerating cash flow, ensuring better management of unused cash, enhancing the performance of near cash assets, optimising their capital structure and financing arrangements, identifying and managing treasury risks and introducing more efficient and control oriented processes. The role of the Treasury function is rapidly changing to address these challenges in an effort to achieve and support corporate goals.

Cash has often been defined as "King" and it is. However, it is no longer good enough just to mobilise and concentrate cash and then invest it overnight with pre-tax returns barely exceeding 5% when the cost of short and longer-term debt is significantly greater. The entire treasury cycle needs to be evaluated more closely. Questions such as, how can we harvest our cash resources better, where can we achieve the most efficient utilisation of our financial resources, and what are our alternative needs to be answered. Treasures and Chief Financial Officer (CFOs) need to get closer to the process of the overall treasury cash and asset conversion cycle (sales/revenue generation/cash flow) to better understand how, when and where cash will flow and then to take steps to enhance its utilisation.

An effective, and efficient treasury management operations predicts, analyses and resolves the following questions which arise during business operations.

- Do and will we have enough cash flow and funds available?
- Are our near cash assets effectively utilised?
- Should we pay down debt? Take on more debt?
- Should we hedge our interest and currency risk exposures?
- Where do our risks exist? What is the impact of those risks?
- How effective is our risk identification and control processes?
- How are these risks being mitigated? Are the methods adopted for mitigating risk effective?
- Do we have enough experienced human resources?
- Do we have the right tools and technology?
- Are we actively identifying opportunities to unlock value?
- Are we implementing effectively and are alternatives properly evaluated?
- Are our Financial Risks managed within a reasonable tolerance level?

By optimising the treasury operations and related risk management process, the companies can reap significant benefits such as:

- Improve cash flows, enhance return or reduce interest expense.
- Put money on the table.
- Reduce excessive and unnecessary costs.
- Introduce more effective technologies.
- Enhance the utilisation of near cash assets.
- Better control and mitigate operational and financial risks.
- Streamline banking structure.
- Strengthen controls and procedures.

1.6.1 Treasury Risk Management

A few of the main focus areas of treasury operations are as follows:

1) **Cash Flow-Receipts and Disbursements**: Accelerating the collection of cash receipts and mobilisation/consolidation of cash, improving effectiveness of lockboxes; cheque clearing, credit card payments, wire transfer systems, and electronic commerce initiatives to optimise cash utilisation. Design and operate effective and control oriented payment and disbursement systems.

2) **Bank and Financial Institution Relations**: Assess global banking and financial institutions relationships among themselves as well as with domestic ones and identify ways to maximize the value of these relationships. Enhance the value received from banking and financial products and implement more efficient processes and account structures to strengthen global cash and treasury risk management. Review capital structure and financing arrangements to maximise the utilisation of financial resources and minimise their cost.

3) **Cash Management Controls**: Assess and improve controls to minimise exposure to fraud and other such risks. This also strengthens and supports internal control initiatives.

4) **Cash Forecasting and Information Reporting**: Improve the reliability, accuracy and timeliness of data from domestic and international cash forecasting models and processes; and improve the effectives of treasury information reporting.

5) **International Cash Management**: Optimize global cash and treasury risk Management by improving Foreign Exchange (FX) management system.

6) **FX and Interest Rate Management**: Evaluate foreign exchange and interest rate practices and strategy to identify, measure, manage and monitor these activities. Also, assess opportunities for improvement.

The two main focus areas of treasury operations are: (i) Fund management, and (ii) Financial risk management. The former includes cash management and asset-liability mix. Financial risk management includes forex and interest rate management apart from managing equity and commodity prices and mitigating risks associated with them.

1.6.2 Functions of the Treasury Department

The important functions of a treasury department are as follows:

a) Setting up corporate financial objectives

- Financial aim and strategies
- Financial and treasury policies
- Financial and treasury systems.

b) Liquidity Management

- Working capital management
- Money transmission and collection management
- Banking relationships.

c) Funding Management

- Funding policies and procedures
- Sources of funds (Domestic, International, Private, Public)
- Types of fund (Debt, equity, hybrid).

d) Currency Management

- Exposure policies and procedures
- Exchange dealings including, hedging, swaps, future and options
- Exchange regulation.

e) **Corporate Finance**

- Business acquisitions and sales
- Project finance and joint ventures.

The main functions of the treasury department can be broadly classified as follows:

a) raising of funds
b) managing interest rate and foreign exchange exposure, and
c) maintenance of liquidity.

Raising of funds in not a regular activity. During normal operations the funds which have already been raised are used for operations, but when the firm opts for new projects, or when the firms go for backward and forward integration, additional amount of funds are required. In these cases the treasury department has to look out for different sources of funds and decide upon the source. The treasury department

will also decide the manner in which funds are to be raised viz., it should be either be through a public issue or private placement, through debt or equity.

With the growing globalisation of economies all over the world, companies are increasingly exporting and importing goods and services. This gives rise to the problem of foreign exchange exposure. For example, company A exports goods worth Rs.44, 000, as of today which is equivalent to $1000 assuming an exchange rate of Rs.44 = 1$. The payment for this export order will be received after 3 months. During this intervening period if the Indian rupee appreciates in comparison to dollar by 5% i.e., Rs. 41.80 = 1$ the effective receipt after 3 months would be Rs.41, 800 only. In order to avoid this the company could take a forward cover through which the unfavourable movement in currency prices are evend out.

The main function of the treasury department is to maintain liquidity. Liquidity here implies the ability to pay in cash the obligations that are due. Corporate liquidity has two dimensions viz., the quantitative and qualitative aspects. The qualitative aspects refer to the ability to meet all present and potential demands on cash in a manner that minimises costs and maximizes the value of the firm. The quantitative aspect refers to quantum, structure and utilisation of liquid assets.

Excess liquidity (idle cash) leads to deterioration in profits and decreases managerial efficiency. It may also lead to dysfunctional behaviour among managers such as increased speculation, unjustified expansion and extension of credit and liberal dividend. On the other hand a tight liquidity position leads to constraints in business operations leading to, reduced rate of return and missing on opportunities. Therefore, the most important challenge before the treasury department is to ensure the 'proper' level of cash in a firm.

☞ Check Your Progress 2

1) Optimising treasury operations results in:

……..

……..

……..

2) The main focus areas of treasury operations are:

a) ……

b) ……..……..

c) ……..…..

d)

……..……

3) The main functions of treasury department are:

a)

…….

b)

..……..……...

c) ……..….

……..

d) .

……..……

1.7 SUMMARY

In this unit we have discussed the motives for holding cash balances. Further we have discussed cash deficit /surplus situation and how this can be contained through the use of various models. Cash planning and forecasting is an important component of cash management and the principal tool for effective cash management is cash budget. We have also dealt with, how a firm can invest surplus cash and the type of instruments that a firm should opt for. We have also examined collection float and payment float and the ways and means to reduce collection float. In the last section we have discussed the various functions of the treasury department and how an effective and efficient treasury department will bring down the financial cost and mitigate risks.

1.8 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) How do cash flow problem arise? What steps are suggested to overcome the problem?

2) What are the reasons for holding cash balance?

3) Explain the Baumol model of cash management.

4) Write a short note on 'Cash Conversion Cycle'.

5) Write short notes on the following:

- Lock Box system
- Zero Balance Accounts.

6) How is temporary cash surplus managed?

7) What is cash flow budget? What are the methods used in the preparation of cash flow budget?

8) Treasury management mainly deals with working capital management and financial risk management. Explain.

9) Prepare the Cash Budget of Fashion Fabrics for the months April 2005 to July 2005 (four months) from the details given below:

(i) Estimated Sales: ***(Rs.)***

February 2005	12,00,000
March 2005	12,00,000
April 2005	16,00,000
May 2005	20,00,000
June 2005	18,00,000
July 2005	16,00,000
August 2005	14,00,000

(ii) On an average 20% sales are cash sales. The credit sales are realised in the third month (i.e., January sales in March).

(iii) Purchases amount to 60% of sales. Purchases made in a month are generally sold in the third month and payment for purchasing is also made in the third month.

(iv) Variable expenses (other than sales commission) constitute 10% of sales and there is a time lag of half a month in these payments.

(v) Commission on sales is paid at 5% of sales value and payment is made in the third month.

(vi) Fixed expenses per month amount to Rs. 75,000 approximately.

(vii) Other items anticipated:

		Due
Interest payable on deposits	1,60,000	(April, 2002)
Sales of old assets	12,500	(May 2002)
Payments of tax	80,000	(June, 2002)
Purchase of fixed assets	6,50,000	(July 2002)

(viii) Opening cash balance Rs. 1,50,000.

Solved Examples

Example 1: Company Ltd. has given the following particulars. You are required to prepare a cash budget for three months ending 31st December 2005.

(i) Rs.

Months	**Sales**	**Materials**	**Wages**	**Overheads**
August	40000	20400	7600	3800
September	42000	20000	7600	4200
October	46000	19600	8000	4600
November	50000	20000	8400	4800
December	60000	21600	9000	5000

Credit terms are:

(ii) Sales/debtors - 10% Sales are on cash basis. 50% of the credit sales are collected in the following month and the balance too is collected in the following months:
Creditors Material 2 months
Wages 1/5 month.
Overheads 1/2 month.

(iii) Cash balance on 1st October, 2005 is expected to be Rs. 8000.

(iv) Machinery will be installed in August, 2005 at the cost of Rs. 100,000 The monthly instalment of Rs. 5000 will be payable from October onwards.

(v) Dividend at 10% on preference share capital of Rs.300,000 will be paid on 1st December 2005.

(vi) Advance to be received for sale of vehicle Rs. 20,000 in December.

(vii) Income-tax (advance) to be paid in December Rs. 5,000.

Solution:

(i) Cash collected from debtors:

Particulars	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Cash Sales10%	4,000	4,200	4,600	5,000	6,000
Credit sales 90%	36,000	37,800	41,400	45,000	54,000
Collection debtors					
1st Month 50%			18,900	20,700	22,500
2nd Month 50%			18,000	18,900	20,700
Total			36,900	39,600	43,200

(ii) Since the period of credit allowed by suppliers is two months the payment for

a purchase of August will be paid in October and so on.

(iii) 4/5th of the wages is paid in the month itself and 1/5th will be paid in the next month and so on.

(iv) 1/2 of the overheads is paid in the month itself and ½ will be paid in the next month and so on.

XYZ Company Ltd.

Cash budget for three months-October to December 2005

(Rs)

Particulars	Oct.	Nov.	Dec.
Opening cash balance	8000	11780	18360
Receipts			
Cash Sales	4600	5000	6000
Collection from debtors	36900	39600	43200
Advance from sale of vehicle	-	-	20000
Total	49500	56380	87560
Payments			
Materials (creditors)	20400	20000	19600
Wages	7920	320	8880
Overheads	4400	4700	4900
Machinery (monthly instalment)	5000	5000	5000
Preference dividend	-	-	30000
Income-tax advance	-	-	5000
Total	37,720	38,020	73,380
Closing balance	11,780	18,360	14,180

Example 2: On 30th September 2002 the balance sheet of M.Ltd. (retailer) was as under**:**

Liabilities	Rs.	Assets	Rs.
Equity shares of		Equipment (at cost)	20000
Rs.10 each fully paid	20000	Less: Depreciation	5000
Reserve	10000		15000
Trade creditors	40000	Stock	20000
Proposed dividend	15000	Trade debtors	15000
		Balance at bank	35000
	85,000		85,000

The company is developing a system of forward planning and on 1st October 2005 it supplies the following information:

Month		Sales		Purchases
		Credit	Cash	Credit
September 2005	Actual	15000	14000	40000
October 2005	Budget	18000	5000	23000
November 2005	Budget	20000	6000	27000
December 2005	Budget	25000	8000	26000

All trade debtors are allowed one month's credit and are expected to settle promptly.

All trade creditors are paid in the months following delivery. On 1st October 2005 all equipments were replaced at a cost of Rs. 30,000. Rs.14, 000 was allowed in exchange for the old equipment and a net payment of Rs. 16,000 was made. The proposed dividend will be paid in December 2005.

The following expenses will be paid: Wages Rs. 3000 per month Administration Rs. 1500 per monthly rent Rs. 3600 for the year upto 30th September 2006 (to be paid in October 2005). You are required to prepare a cash budget for the months of October November, and December 2005.

Solution:

Cash Budget of M. Ltd. for the quarter ending 31st December 2005

(Rs.)

Particular	October	November	December	Total
Opening Balance	35,000	(9,100)	(12,600)	35000
Cash receipts				
Sales				
Cash sales of current month	5000	6000	8000	19000
Collection of credit sales of previous month	15000	18000	20000	53000
Cash Payment				
Payment to creditors (of preceding month purchase)	40000	23000	27000	90000
Payment for new equipment	16000	-	-	16000
Wages	3000	3000	3000	9000
Administration expenses	1500	1500	1500	4500
Rent	3600	-	-	3600
Dividend	-	-	15000	15000
Total (B)	64100	27500	46500	138100
Closing Balance	9100	12600	31100	31100
Total (A)	55,000	1,49,000	15,400	1,07,000

Example 3: From the following details furnished by a business firm, prepare its Cash Budget for April 2005:

(i) The sales made and collection obtained conform to the following pattern:

Cash Sales	20%
Credit Sales	40% collected during the month of sales 30% collected during the first month following the month of sale 25% collected during the second month following the month of sale 5% become bad debts

(ii) The firm has a policy of buying enough goods each month to maintain its inventory at 2.5 times the following month's budgeted sales.

(iii) The firm is entitled to 2% cash discount on all its purchases if bills are paid within 15 days and the firm avails of all such discounts.

(iv) Cost of goods sold without considering the cash discount is 50% of the sales value at normal selling prices. The firm records inventory net of discount.

(v) Other information:

Sales (Rs.)

January 2005 (actual)	1,00,000
February 2005 (actual)	1,20,000
March 2005 (actual)	1,50,000
April 2005 (budgeted)	170,000
May 2005 (budgeted)	1,40,000

(Rs.)

Inventory on 31st March 2005	2,25,400
Closing cash balance on 31st March, 2005	30,000

Gross purchases made in March 2005	1,00,000

(vi) Selling general and administration expenses budgeted for April 2005 amounts to Rs. 45,000 (includes Rs. 10,000 towards depreciation).

(vii) All transactions take place at an even pace in the firm.

Solution:

Cash Budget for April 2005

Particulars		**(Rs.)**
Opening balance		30,000
Collection from Sales:		
Cash Sales	(20% of Rs. 1,70,000)	34,000
Collection against Credit Sales		
Feb. 2002 Sales	(25% of Rs. 96,000)	24,000
March, 2002 Sales	(34% of Rs. 1,20,000)	36,000
April, 2002 Sales	(40% of Rs. 1,36,000)	54,400
Total		1,78,400
Payments		
For purchases:		
March 2002	(Rs. 1,00,000 × 98% × 1/2)	49,000
April 2002	(Rs. 29,400 × 12)	14,700
Selling, general and Admn. Expense excluding depreciation		35,000
Total		**98,700**
Budget Closing Cash balance		79,700

Working Notes:

Purchase Budget	**Gross**	**Net**
Desired ending inventory	1,75,000	1,71,500
Add Cost of Sales for April 2002	85,000	83,300
Total requirements	2,60,000	2,54,800
Deduct beginning inventory	2,30,000	2,25,400
Purchases to be made in April, 2002	30,000	29,400

Example 4: Prepare a cash budget for the three months ended 30th September 2005 based on the following information:

(Rs.)

Cash in bank on 1st July, 2005	25000
Monthly salaries and wages (estimated)	10000
Interest payable in August 2005	5000

(Rs.)

Estimated	**June**	**July**	**August**	**September**
Cash sales (actual)	1,20,000	140000	152000	121000
Credit sales	100000	80000	140000	120000
Purchases	160000	170000	240000	180000
Other expenses	18000	20000	22000	21000

Credit sales are collected 50% in the month of sale and 50% in the following month.

Collections from credit sales are subject to 10% discount if received in the month of sale and to 5% if received in the month following. 10% of the purchase are in cash and balance is paid in next month.

Solution:

Cash Budget for three months-July 2005 to September 2005

		July	**August**	**September**
Opening Balance	(i)	25,000	57,500	96,500
Receipts				

Sales: Cash		1,40,000	1,52,000	1,21,000
Credit Current month		36,000	63,000	54,000
Previous month		47,500	38,000	66,500
Total Receipts	(ii)	2,23,500	2,53,000	2,41,500
Total Cash	(iii) = (i)+(ii)	2,48,500	3,10,500	3,38,000
Payments:				
Purchases Cash		17,000	24,000	18,000
Credit (Previous Month)		1,44,000	1,53,000	2,16,000
Other expenses		20,000	22,000	21,000
Interest		-	5,000	-
Salaries and Wages		10,000	10,000	10,000
Total Payment	(iv)	1,91,000	2,14,000	2,65,000
Closing Balance	(iii)-(iv)	57,500	96,500	73,000

1.9 SOLUTIONS/ANSWERS

Check Your Progress 1

1) Cash Balance – April Rs. 56,000; O/D required – May Rs. 47,000 but assumed Rs. 50,000, June Rs. 1,20,000 Total Rs. 1,70,000.

2) Closing Cash Balance: April Rs. 53,000; May Rs. 81,000 and June Rs. 91,000.

3) Closing Cash Balance September Rs. 7,200 October Rs. 15,185 (Cr.); November Rs. 11,653 (Cr.).

UNIT 2 RECEIVABLES MANAGEMENT

Structure **Page Nos.**

2.0 INTRODUCTION

In the previous unit, we have seen how firms determine their needs for current assets and manage their holdings in cash and marketable securities. In a typical manufacturing company the debtors to total asset ratio varies from 20 to 25% which is a considerable investment of funds. The effective management of this asset will have a significant effect on the profitability of the company. The receivable (debtors) arise due to credit sales, which is undertaken in order to encourage customers to purchase goods or services. Accounts receivable use funds, and tying up funds in these investments has an associated cost which, must be considered along with the benefits from enhanced sales of goods and services. In this unit we are going to discuss the various issues involved in management decisions of extending credit (i.e., accounts receivable).

2.1 OBJECTIVES

After going through this unit, you should be able to:

- understand the need for establishing sound credit policy;
- understand the various credit policy variables;
- understand the credit evaluation process;
- understand the techniques of monitoring receivables, and
- understand the concept of factoring.

2.2 TERMS OF PAYMENT

Terms of payment vary widely in practice. At one end, if the seller has financial resources, s/he may extend liberal credit to the buyers, on the other hand the buyer pays in advance and finances the entire trade cycle. The terms of credit vary for different industries and are dictated by prevailing trade practices. In general, businesses operating in monopoly environment will insist on advance/cash payment whereas business operating in a competitive environment will extend credit to the buyers. The major terms of payment are listed below:

Cash Terms

When goods are sold on cash terms, the sales consideration (payment) is received either before goods are sold (advance payment) or when the goods are delivered (cash on delivery) Cash term generally exist under the following conditions:

(a) when goods are made to order
(b) when the buyer is perceived to be less credit worthy
(c) the seller is in strong bargaining position.

Open Account

Credit sales is generally on open account which implies that the seller ships the goods to the buyer and thereafter sends the bill (invoice).

Consignment

Under this type of terms, the goods are merely shipped to the consignee; they are not sold to the consignee. The consignee then sell these goods to the third party. One should note here that the title of the goods is retained by the seller till they are sold by the consignee to the third party. Sales proceeds are remitted by the consignee to the seller.

Negotiable Instruments/Hundi

When the goods are sold on credit either through an open account or through consignment an formal legal evidence of the buyers obligation is not created. In order to overcome this a more secure agreement usually in the form of a draft is sought. A draft represents an unconditional order issued by the seller to the buyer asking the buyer to pay on demand (demand draft) or at some future certain date (time draft) the amount specified on the draft. The draft is usually accompanied by the shipping documents that are deliverable to the drawee when he pays or accepts the draft. Time drafts can be discounted with the bank. The draft performs four useful functions:

(a) it creates an evidence of buyer obligation
(b) it helps in reducing the cost of finance
(c) it provides liquidity to the seller
(d) it is a negotiable instrument.

Letter of Credit

Under the documentary bills the seller faces a lot of risk – the risk of non-payment or non-acceptance of goods. This poses a major risk for the seller. This additional security under this method comes from the fact that, the letter of credit is issued by the bank and not by the party to the contract buyer. This instrument guarantees payment to the seller on fulfilment of certain conditions specified therein. The Letter of Credit can be defined as an instrument issued by a bank in favour of the seller (known as beneficiary) whereby the issuing bank undertakes to pay the beneficiary a certain sum against delivery of specific documents within a stated period of time. There are many forms of a letter of credit; the most widely used are as follows:

1) Revocable vs. Irrevocable Letter of Credit
2) Confirmed vs. Unconfirmed Letter of Credit
3) Revolving Letter of Credit
4) Transferable Letter of Credit
5) Back to Back Letters of Credit
6) With Recourse vs. Without Recourse Letter of Credit.

2.3 CREDIT POLICY VARIABLES

Each company should establish its own credit policy depending upon the ground situation and the environment in which it is operating. The main objective of the credit policy is to stimulate sales as well as control expenses and bad debts associated with granting credit. The following are the main components of a credit policy.

1) credit period to be allowed to general customers
2) credit period to be allowed to special customers and the criteria for defining special customer to be predefined
3) credit rating system
4) cash discount policy or discount policy for pre-payment by debtors
5) collection policy
6) accounting system and management information system (MIS) for scrutiny and efficient management of debtors
7) policy for dealing with bad and doubtful debts
8) credit insurance cover
9) proper documentation of credit sales.

If we regroup the above components they can be classified under the four dimensions of a firm's credit policy which are as follows:

a) credit standards
b) credit period
c) cash discount
d) collection effort.

Deciding on the credit policy involves a trade off between sales and expenses/losses. Decreasing credit standards would increase sales but at the same time would lead to increase in bad debt losses. The same is true for other variables of credit policy also. Now let us examine the effect of each of these variables on the net profit on the firm.

Credit Standards

This variable deals with the granting of credit. On one extreme all the customers are granted credit and on the other extreme none of them are granted credit irrespective of their credit rating, but in today's competitive environment this is not possible. In general liberal credit standards lead to increased sales accompanied by higher incidence of bad debts, tying of funds in accounts receivable and increased cost of credit collection. Stiff or tight credit standards lead to decreased sales, lower incidence of bad debts, decreased investment in accounts receivable and decreased collection cost.

The quantitative effect of relaxing the credit standards on profit can be estimated by the equation 2.1

$$\Delta NP = [\Delta S(1 - V) - \Delta S\, b_n](1 - \mathrm{t}) - k\Delta I \qquad (2.1)$$

where

Δ NP	=	Change in net profit
Δ S	=	Increase in sales
V	=	Ratio of variable cost to sales
b_n	=	Bad debt ratio on new sales
T	=	Tax rate
K	=	Cost of capital
Δ I	=	Increase in receivable investment
Δ I	=	$\frac{\Delta S}{360} \times ACP \times V$

$\frac{\Delta S}{360}$ = Average daily change (increase in sales)

ACP = Average collection period

Now let us see how each component of equation 2.1 affects net profit. $\Delta S (1-V)$ represents the increase in gross incremental profit, due to relaxed credit standard and for this purpose gross profit, is defined as Sales-Variable cost. ΔSb_n calculates the bad debts on incremental sales. The first part of the equation $[\Delta S (1-V) - \Delta Sb_n]$ (1-t) represents the post tax operating profit arising out of incremental sales and $k\Delta I$ measures the post tax opportunity cost of capital locked in additional investment on account of relaxed credit standards. The pre tax operating profit is multiplied by (1–t) in order to get past tax operating profit.

Example 2.1: The current sales of M/s ABC is Rs.100 lakhs. By relaxing the credit standards the firm can generate additional sales of Rs.15 lakhs on which bad debt losses would be 10 per cent. The variable cost for the firm is, 80% percent average collection period ACP is 40 days and post tax cost of funds is 10 percent and the tax rate applicable to the firm is 40 percent. Find out whether the firm should relax credit standards or not?

Solution:

$$\Delta \text{ NP} = [\Delta S (1-V) - \Delta S\, b_n] (1-t) - k\Delta I$$

$$\Delta \text{ NP} = [15 (1-.80) - 15\times .1] (1-.4) - .10\times \frac{15}{360} \times 40 \times .80$$

$$= [3 - 1.5] (.6) - .1333$$

$$= .9 - .1333$$

$$= .7667 \times 1{,}00{,}000$$

$$= 76{,}667$$

Since the impact of change in credit standards results in a positive change in net profits therefore the proposed change should be accepted.

Credit Period

Credit period refers to the length of time provided to the buyer to pay for their purchases. During this period no interest is charged on the outstanding amount. The credit period generally varies from 30 to 90 days and in some businesses even a period of 180 days is allowed. If a firm allows 45 days of credit with no discount for early payment credit terms are stated as 'net 45'. In case the firm allows discount for early payment the credit terms are stated as 1.5/15, net 45' implying that if the payment is made within 15 days a discount of 1.5 percent is allowed else the whole amount is to be paid within 45 days.

Increasing the credit period results in increased sales but at the same time entails increased investment in debtors and higher incidence of bad debts. Decreasing the credit period would have the opposite result. The effect of increasing the credit period on net profit can be estimated with the help of equation 2.2.

$$\Delta \text{NP} = [\Delta S (1-V) - \Delta Sb_n] (1-t) - k\ \Delta\ I \qquad (2.2)$$

In this case ΔI is calculated as follows:

$$\Delta I = (ACP_n - ACP_0) \left[\frac{50}{360}\right] + V(ACP_n)\frac{\Delta S}{360} \qquad (2.2a)$$

where Δ I = increase in investments

ACP_n = new average collection period
ACP_0 = old average collection period

In equation 2.2a the first term represents incremental investments in receivables associated with existing sales and the second term represents the investment in receivables arising from incremental sales.

Example 2.2: M/s ABC has an existing sales of Rs.50 lakhs and allows a credit period of 30 days to its customers. The firms cost of capital is 10 percent and the ratio of variable cost to sales is 85. The firm is contemplating on increasing the credit period to 60 days which would result in an increased sales of Rs.5 lakhs. The bad debts on increased sales are expected to be 8 percent. The tax rate for M/s ABC is 40 percent. Should the firm extend the credit period?

Solution: $\Delta \text{I} = (\text{ACP}_n - \text{ACP}_0)\ [\frac{S0}{360}] + V\,(ACP_n)\frac{\Delta S}{360}$

$$\Delta I = (60-30)\left[\frac{50}{360}\right] + .85 \times 60 \times \frac{5}{360}$$

$$\Delta I = 30 \times \frac{50}{360} + .708333$$

$$\Delta I = 4.8749997 \times 1{,}00{,}000 = 4{,}87{,}500 = 4{,}874{,}99.9$$

$$\Delta NP = \left\lfloor \Delta S\,(1-V) - \Delta\, Sb_n \right\rfloor (1-t) - k\Delta I$$

$$= [5\,(015) - 5 \times .08\,](1-04) - .10 \times 4{,}87{,}500$$

$$= [.75 - .4\,](.6) - 4.875000$$

$$= (.35)\,(-6) - .48750$$

$$= (.21 - .48750\,) \times 1{,}00{,}000$$

$$= -27{,}750$$

The increase in credit period results in a negative net profit therefore the credit period should not be extended.

Cash Discount

Cash discount is offered to buyers to induce them to make prompt payment. The credit terms specify the percentage discount and the period during which it is available. Liberal cash discount policy imply that either the discount percentage is increased or the discount period is increase. This leads to enhanced sales, decrease in average collection period and increase in cost. The effect of this on net profit can be estimate by the equation 2.3.

$$\Delta NP = [\Delta S\,(1-V) - \Delta DIS](1-t) + k\Delta I \qquad (2.3)$$

where Δ I = Savings in receivables investment

Δ DIS = Increase in discount cost

$$\Delta \text{I} = \frac{S0}{360}(ACP_0 - ACP_n) - V\frac{\Delta S}{360}ACP_n \qquad (2.3a)$$

$$\Delta \text{DIS} = \text{P}_n\,(\text{S}_0 + \Delta\text{S})\,\text{d}_n - \text{P}_0\text{S}_0\text{d}_0 \qquad (2.3b)$$

where Pn = Proportion of discount sales after liberalising the discount terms.

S_0 = Sales before liberalising the discount terms
ΔS = Increase in sales
d_n = New discount percentage
P_0 = Proportion of discount sales before liberalising the discount terms
d_0 = Old discount percentage

Example 2.3: M/s ABC's present credit terms are 1/10 net 30 which they are planning to change to 2/10 net 30. The present average collection period is 20 days and the variable cost to sales ratio is 85 and the cost of capital is 10 percent. The proportion of sales on which customers currently take discount is .5. After relaxation of discount terms it is expected that the ACP will reduce to 14 days, sales will increase from Rs.80 lakhs to Rs 85 lakhs and the proportion of discount sales will increase to .8. Tax rate for the firm is 40% calculate the effect of above changes on net profit.

Solution: $\Delta I = \frac{S_0}{360}(ACP_0 - ACP_n) - \vee \frac{\Delta S}{360} ACP_n$

$= \frac{80}{360}(20-14) - .85 \times \frac{5}{360} \times 14$

$= 1.1680555$ lakhs

$\Delta DIS = P_n (S_0 + \Delta S)\, d_n - P_0 S_0 d_0$

$= .96$ lakhs

$\Delta NP = \Delta S(1-v) - \Delta DIS](1-t) + k\Delta I$

$= [5(1-.85) - .96](1-.4) + .1 \times 1.1680555$

$= (.75 - .96)(.6) + .116805555$

$= -.126 + .11680555$

$= -.009194$ lakhs

Since the increase in net profit is negative the cash discount policy should not be liberalised.

Collection Effort

The collection policy of a firm is aimed at timely collection of overdue amount and consist of the following.

1) Monitoring the state of debtors (account receivable)
2) Reminders
3) Personal letters
4) Telephone calls
5) Personal visit of salesman
6) Restriction of credit
7) Use of collection agencies
8) Legal action.

An efficient and rigorous collection program tends to decrease sales, shorten average collection period, reduce bad debts percentage and increase the collection expenses, whereas a lax collection program will have just the opposite effect. The effect of decreasing the collection effort on net profit can be estimated with the equation 2.4.

$\Delta NP = [\Delta S (1-V) - \Delta BD] (1-t) - k \Delta I$

where ΔBD = increase in bad debt cost

ΔI = increase in investment in receivables

$$\Delta I = \frac{S_0}{360}(ACP_n - ACP_0) + \frac{\Delta S}{360} ACP_n V$$

$$\Delta BD = b_n (S_0 + \Delta S) - b_0 S_0$$

Example 2.4: M/s ABC is considering relaxing its collection efforts. At present its sales are Rs.40 lakhs, the ACP is 20 days and variable cost to sales ratio is .8 and bad debts are .05 per cent. Relaxation in collection effort is exected to push sales up by Rs. 5 lakhs, increase ACP to 40 days and bad debt ratio to 0.06. ABC tax rate is 40 percent. Calculate the effect of relaxing credit effort on net profit.

Solution:

Δ BD $= b_n (S_0 + \Delta S) - b0\ S0$
$= .06\ (40+5) - .05 \times 40$
$= 2.7-2$
$= .7$ lakhs

$$\Delta I = \frac{S_0}{360}(ACP_n - ACP_0) + \frac{\Delta S}{360} ACP_n V$$

$$= \frac{40}{360}(40-20) + \frac{5}{360} \times 40 \times .8$$

$$\frac{20}{9} + \frac{4}{9}$$

$$\Delta I = 2.6666667$$

$$\Delta NP = [\Delta S(1-V) - \Delta BD](1-t) - k\Delta I$$

$$= [5(.2) - .7](.6) - .12(2.666667)$$

$$= .18 - .32$$

$$= -.14 \text{ lakhs}$$

Since the effect on net profit is negative therefore the credit efforts should not be relaxed.

Check Your Progress 1

1) As a part of the strategy to increase sale and profit, the sales manager of the company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by Rs. 1,00,000 per annum. Production and selling expenses amount to 80% of sales and the income tax rate is 50%. The company's minimum required rate of return (after tax) is 25%. Should the sales manager's proposal be accepted?

2) Manjit Ltd. is examining the question of relaxing its credit policy. It sells at present 20,000 units at a price of Rs. 100 per unit, the variable cost per unit is Rs. 88 and average cost per unit at the current sales volume is Rs. 92. All sales are on credit, the average collection period being 36 days.

   A relaxed credit policy is expected to increase sales by 10% and the average age of receivables to 60 days. Assuming 15% return, should the firm relax its credit policy? Assume 360 days in a year.

3) A company wants to adopt a stricter collection policy. While going through its books the following details are revealed:

   The enterprise is at present selling 20,000 units on credit at a price of Rs. 30 each, the variable cost per unit is Rs. 23 while the average cost per unit

is Rs. 27. average collection period is 56 days and the collection expenses amount to Rs. 8,000 and bad debts are 3%.

If the policy of collection is tightened a sum of Rs. 15,000 more will be required as collection charges. Bad debts down to 1 percent and collection period will reduce to 40 days. Sales volume is expected to reduce by 400 units. Advice the company whether it should implement the decision or not. Assume 20% rate of return on investments.

4) The present credit terms of Padmavati Ltd. are '1/10 net 30'. Its annual sales are Rs. 80,00,000, and average collection period is 20 days. Its variable cost and average table costs to sales are 0.85 and 0.95 respectively and its cost of capital is 10 per cent. The proportion of sales on which customers currently take discount is 0.5. The company is considering relaxing its discount terms of '2/10 net 30'. Such relaxation is expected to increase sales by Rs. 5,00,000, reduce the average collection period to 14 days and increase the proportion of discount sales to 0.8. What will be the effect of relaxing the discount on the company's profit? Take year as 360 days.

2.4 CREDIT EVALUATION

One of the important elements of credit management is the assessment of the credit risk of the customer. While assessing risk two type of errors occur which are as follows.

Type 1 error: Good customers are misclassified as poor credit risk
Type 2 error: Bad customers are misclassified as good credit risk.

Both the errors are costly. Type 1 error leads to loss of profit on sales and also loss of good customers. Type II errors leads to bad debts and other costs associated with the bad debts. These type of errors can't be totally eliminated but a proper credit evaluation process can reduce these two types of errors. The credit evaluation process involves the following steps.

1) Credit information
2) Credit investigation
3) Credit limits
4) Collection policy.

Credit Information

In order to ensure that the receivables are collected in full and on due date from the customers, prior information of their credit worthiness should be available. This information can be gathered from a variety of sources, which we are going to discuss shortly. One important thing which needs to be kept in mind while gathering credit information is that collecting credit information involves cost, therefore the cost of collecting information should be less than the potential profitability of credit sales. Another factor which should be borne in mind is that collecting credit information may involve a lengthy period of time, on account of this the credit granting decision should not be delayed for long. Depending upon these two factor any or a combination of the following process may be employed to collect the information.

- **Financial Statements:** Profit and loss a/c and Balance sheet of customers firm provide valuable insight on the operating financial soundness, sources of funds, application of funds, and debtors and creditors. The following ratios calculated from financial statements seems particularly helpful in this context: Current ratio,

and acid test ratio, debt equity ratio, Earning Before Interest and Taxes (EBIT) to total assets ratio and return on equity.

- **Bank References**: A customer's bank account is also a valuable source of information regarding the credit worthiness of the customer. A thorough analysis of bank transactions would reveal the financial behaviour and characteristics of the customer. Bank references can be obtained either directly or by requesting the customer to instruct his bank to provide the same.

- **Trade references**: The seller can ask the prospective customer to give trade references. Trade references are usually of those firms with whom the customer is having current dealings.

- **Other Sources**: A firm can also obtain information about the prospective customer from credit rating agencies like (CRISIL, ICRA, CARE) and trade and industry associations.

Credit Investigation

Once the credit information is gathered the next step is to analyse the gathered information and isolate those matters, which may require further investigation. The factors that affect the extent and nature of credit investigation are as follows:

- Type of customer, whether new or existing
- The customer's business line, background and the related trade risks
- The nature of products-perishable or seasonal
- The size of the customer's order and expected further volume of business with him/her
- Company's credit policies and practices
- Capacity: Capacity refers to the ability of the buyer to pay the due on time and is generally judged by the past turnover and the repayment behaviour
- Character: Character refers to the willingness of the buyer to pay. The character of the buyer is generally judged by his/ her past record of payments and default history if any.
- Collateral: Collateral means the security against the credit granted to customers. A buyer willing to furnish adequate collateral is judged as more creditworthy as compared to buyers who are unable to furnish any collateral.
- Conditions: Conditions here refer to the sensitivity of the buyer to general economic environment.

Analysis of Credit File: Credit file is a compilation of all the relevant credit information of the customer. All the credit information collected during the credit information process is annexed to this file. The information of all the previous transactions and payments related to it are also recorded in the credit file. Any change in customer's payment behaviour like extension of time delayed payments enhancing credit limits etc. are also recorded in the credit file. In case of new customers the credit information collected should be thoroughly analysed and examined and in case of existing customer the credit file should be analysed while extending credit for larger accounts or for longer periods.

Analysis of Financial Ratios: Ratios are calculated to determine the customer's liquidity position and ability to repay debts. The ratios so calculated should be compared with the industry average and the nearest competitors.
Analysis of Business and its Management: Besides analysing the fundamental strength of the customers business the firm should also take into consideration the quality of the management and the nature of the customer business. Some business are inherently risky and granting credit to such customers may prove risky.

Credit Limit

A credit limit is the maximum amount of credit, which the firm will extend at a point of time. It indicates the extent of risk taken by the firm by supplying goods on credit to a customer. Once the firm has decided to extend credit to the customer the amount and duration of the credit will have to be decided. The amount of credit to be granted will depend on the customer's financial strength.

Collection Policy

Proper management of receivables require an appropriate collection policy which outlines the collection procedures. Collection policy refers to the procedure adopted by a firm to collect payments due on past accounts. The basic objective of the collection policy is to minimise average collection period and bad debt losses. A strict collection policy can affect the goodwill and can adversely affect potential future sales whereas on the other hand a lenient collection policy can lead to increased average collection period and increased bad debt losses. An optimum collection policy should aim towards reducing collection expenditure.

2.5 MONITORING RECEIVABLES

A firm needs to continuously monitor and control its receivables to ensure that the dues are paid on the due date and no dues remain outstanding for a long period of time. The following two methods are used to evaluate the management of receivables.

1. Average collection period
2. Aging schedule.

Average collection period (ACP): Average collection period is defined as

$$\text{ACP} = \frac{\text{Debtors} \times 365}{\text{Credit Sales}}$$

The average collection period so calculated is compared with the firm's stated credit period to judge the collection efficiency. For example, if the firm's stated collection period is 45 days and the actual collection period is 60 days, one may conclude that the firm's collection efforts are lax. An extended credit period leads to liquidity problems and may also result in bad debts. Two major drawbacks of this method are:

(i) It gives an average picture of collection efforts and is based on aggregate data. It fails to pin point the receivables which are overdue.
(ii) It is susceptible to sales variation and the period over which sales and receivable have been aggregated.

Ageing Schedule: The ageing schedule (AS) classifies outstanding accounts receivable at a given point of time into different age brackets. An illustrative ageing schedule is given below.

Age Groups (in days)	Outstanding (Rs.)	Percentage
0-30	45,000	37.50
31-60	15,000	12.50
61-90	10,000	12.50
91-120	30,000	250
Over 120	1,20,000	100.00

The actual aging schedule of the firm is compared with some standard ageing schedule so as to determine whether accounts receivables are in control. If the greater proportion receivable are in the higher age schedule than there is a need for some corrective action.

2.6 FACTORING

Receivable management is a specialised activity and requires a lot of time and effort on the part of the firm. Collection of receivables often poses problems, particularly for small and medium size organisations. Banks do finance receivables but this accommodation is for a limited period and the seller has to bear the risk in case debtors default on payment.

In order to overcome these problems the firms can assign its credit management and collection to specialist organisation known as factoring organisations.

Factoring is financial as well as management support to a firm. Through factoring non-productive, inactive assets (Book debts or receivables) are assigned to a factor which may be a bank or a financial institution or any other organisation which in turn collects receivables from the debtors for a commission. The factoring can be defined as "a business involving a continuing legal relationship between the factor and a business concern (the client) selling goods and services to trade customers (the customers) whereby the factor purchases the clients accounts receivable and in relation thereto, controls the credit extended to customers and administers the sales ledger".

Factoring Services: The following basic services are provided by the factor apart from the core service of purchasing receivables.

1) Sales Ledger administration and credit management
2) Credit collection and protection against default and bad debt losses
3) Financial accommodation against the assigned book debts (receivables).

In addition to these services the following services are also being provided by the factor

1) Providing information about prospective buyers
2) Providing financial counselling
3) Assistance in liquidity management and sickness prevention
4) Financing acquisition of inventories
5) Providing assistance for opening letter of credit for the client.

Types of Factoring

The factoring facilities can be broadly classified in four groups which are as follows:

1) Full service non recourse (old line)
2) Full service recourse factoring
3) Bulk agency factoring
4) Non notification factoring.

Full Service Non Recourse: Under this method the book debts are purchased by the factor assuming 100 percent credit risk. In case of default by the debtor the whole risk is borne by the factor. In addition to this the factor may also advance 80-90% of the books debts immediately to the client. Payments are made directly to the factor by the customers. The factor also maintains the sales ledger and accounts and prepares age-wise reports of outstanding book debts. This type of factoring services are specially suited to the following conditions when,

a) Amounts involved per customer are relatively substantial
b) There are large number of customers of whom the client can't have personal knowledge
c) Clients wish to have 100% cover rather than 70 to 80% cover provided by the insurance companies.

Full Service Recourse Factoring: In this type of factoring the client has to bear the risk of default made by the debtors. In case the factor had advanced funds against book debts on which the customer subsequently defaults the client will have to refund the money. This type of factoring is more a method of short-term financing rather than pure credit management and protection service. This type of factoring is suitable for cases where there is high spread customers with relatively low exposure or where the client is selling to high risk customers.

Advance Factoring and Maturity Factoring: In both non-recourse and recourse factoring if the factor advances cash against book debts to the client immediately on assignment of book debts it is known as advanced factoring. In maturity factoring the factor makes payment to the client on maturity of book debts i.e., when they are due. In non-recourse maturity factoring the payment is on maturity or when book debts are collected or when the customer becomes insolvent. In recourse factoring the factor pays the client when book debts have been collected.

Bulk Agency Factoring: This type of factoring is basically used as a method of financing book debts. Under this type of factoring the client continues to administer credit and maintain sales ledger. The factor finances the book debts against bulk either on recourse or without recourse. This sort of factoring became popular with the development of consumer durable market where credit management is not a problem, but the firms require temporary financial accommodation.

Non-Notification Factoring: In this type of factoring customers are not informed about the factoring agreement. The factor performs all the usual functions without disclosing to customer that they own the book debts.

Costs and Benefits of Factoring

There are two types of costs involved in factoring:

1) the factoring commission or service fee, and
2) the interest on advances granted by the factor to the firm.

Factoring commission is paid to cover credit evaluation, collection, maintenance of sales ledger, other services and to cover bad debt losses. The factoring commission will depend upon the total volume of receivables, the size of individual receivables and quality of receivables. The commission for non- recourse factoring is higher than recourse factoring as the former factor assumes full credit risk.

In India the cost of factoring varies from 2.5% to 4% where as in developed countries it ranges from 1% to 3%.

The interest on advances is usually higher than the prime lending rates of the bank or the bank overdraft rate. In the United States of America, factors charge a premium of 2 to 5% over and above the prime interest rate.
The high cost of factoring is partly off set by the benefits of factoring some of which are as follows:

- factoring provide specialised service in credit management, thereby freeing resources in the form of management's time and attention which they can focus on core issues of manufacturing and marketing, and

- factoring helps the firm to save cost of credit administration due to the scale of economies and specialisation.

2.7 SUMMARY

Trade credit creates debtors or accounts receivables. Trade credit is used as a marketing tool to gain competitive advantage over trade rivals. A firm's investment in accounts receivable would depend upon the volume of credit sales and collection period. This investment in receivables can be increased or decreased by altering the credit policy variables. The main variables of credit policy are credit period and cash discount. The collection efforts of the firm are aimed at reducing bad debt losses and accelerating collection from slow players. Factoring involves sale of receivables to specialised firms known as factors. Factoring is basically used to improve liquidity and for the timely collection of debts. Factors charge interest on advances and commission for other services.

2.8 SELF-ASSESMENT QUESTIONS/EXERCISES

1) Describe the major's terms of payment in practice.

2) What are the importance dimensions of a firm's credit period.

3) Discuss the consequences of lengthening versus shortening of the credit period.

4) Discuss the effects of liberal versus stiff credit standards.

5) What are the effects of liberalising the cash discount policy?

6) Develop a simple system of risk classification and explain its rationale.

7) Once the creditworthiness of a customer has been assessed, how would you go abut analysing the credit granting decision?

8) What benefits and costs are associated with the extension of credit? How should they be combined to obtain an appropriate credit policy?

9) What is the role of credit terms and credit standards in the credit policy of a firm?

10) What are the objectives of the collection policy? How should it be established?

11) What will be the effect of the following changes on the level of the firm's receivables?
    a. Interest rate increases
    b. Recession
    c. Production and selling costs increase
    d. The firm changes its credit terms from "2/10, net 30" to "3/10, net 30".

13) The credit policy of a company is criticised because the bad-debt losses have increased considerably and the collection period has also increased. Discuss under what conditions this criticism may not be justified.

14) What credit and collection procedures should be adopted in case of individual accounts? Discuss.

Problems

1) The present sales of M/s Ram Enterprises is Rs.50 million. The firm classifies customers into 3 credit categories: A, B and C. The firm extends unlimited credit to customers in category A, limited credit to customers in category B, and no credit to customer in category C. As a result of this credit policy, the firm is

foregoing sales to the extent of Rs. 5 million to customers in category B and Rs 10 million to customer in category C. The firm is considering the adoption of a more liberal credit policy to customers in category C who would be provided limited credit. Such relaxation would increase the sales by Rs. 10 million on which bad debt losses would be 8 per cent. The contribution margin ratio for the firm is 15 per cent, the average collection period is 60 days, and the cost of capital is 12 per cent. The tax rate for the firm is 40 per cent. What will be the effect of relaxing the credit policy on the net profit of the firm?

2) The Aravali Corporation currently provides 45 days of credits to its customer. Its present level of sales is Rs. 15 millions. The firm's cost of capital is 15 per cent and the ratio of variable costs to sales is 0.80. The firm is considering extending its credit period to 60 days. Such an extension is likely to push sales up by Rs. 1.5 million. The bad debt proportion on additional sales would be 5 per cent. The tax rate is 45 per cent. What will be the effect of lengthening the credit period on the firm?

3) The present credit terms of Lakshmi Company are 1/10, net 30. It sales are Rs. 12 million, its average collection period is 24 days, its variable cost to sales ratio is 0.80 and its cost of funds is 15 per cent. The proportion of sales on which customer currently take discount is 0.3. Bhartya Company is considering replacing its discount terms to 2/10, net 30. Such relaxation is expected to increase the proportion of discount sales to 0.7. What will be the effect of relaxing the discount policy on net profit? The tax rate of the firm is 50 per cent.

4) Shyam Venture is considering relaxing its collection efforts. Presently their sales are Rs. 50 million, its average collection period 25 days. The relaxation in collection efforts is expected to push sales up by Rs.6 million, increase the average collection period to 40 days and raise the bad debts ratio to 0.06. The tax rate of the firm is 30 per cent.

5) Ram Enterprises sell on terms 2/10 net 45. Total sales for the year is 40 million. Thirty per cent of the customers pay on the tenth day and avail the discount, the remaining seventy per cent pay, on average collection period and the average investment in receivables.

6) Anil & Company sells on terms 1/5 net 15. The total sales for the year are Rs. 10 million. The cost goods sold is Rs. 7.5 million. Customers accounting for 30 per cent of sales take discount and pay on the fifth day, while others take an average of 35 days to pay.

   Calculate:

   (a) the average collection period and
   (b) the average investment in receivables.

7) Udar Limited is considering a change in its credit terms from 2/10, net 30 to 3/10 net 45. This change is expected to:

   a) increase total sales from Rs. 50 million to Rs. 60 million
   b) decrease the proportion of customer taking discount from 0.70 to 0.60
   c) increase the average collection period from 20 days to 24 days.

   The gross profit margin for the firm is 15 per cent and the cost of capital is 12 per cent. The tax rate is 40 per cent.

   Calculate:

   a) the expected change in profit and
   b) the expected cost of increasing the cash discount.

8) The financial manager of a firm is wondering whether credit should be granted to a new customer who is expected to make a repeat purchase. On the basis of credit evaluation the financial manager feels that the probability is the customer will pay 0.85 and the probability that S/he will pay for the repeat purchase thereby increases to 0.95. The revenues from the sale will be Rs.10,000 and the cost of sale would be Rs.8,500. These figures apply to both the initial and the repeat purchase should credit be granted?

9) A firm is wondering whether to sell goods to a customer on credit or not. The revenue from sales will be Rs. 10,000 and the cost of sale will be Rs 8,000. What should be the minimum probability that the customer will pay, in order to sell profitably?

2.9 SOLUTIONS/ANSWERS

Check Your Progress 1

1) Net Benefit Rs. 2,500; Proposal should be accepted. Profit on Additional Sales Rs. 5,000; Additional Investment in Receivables Rs. 10,000 and cost is Rs.2,500.

2) Net Profit Rs. 1200. Credit policy should be relaxed. Profit on Additional Sales Rs. 24,000; Additional Investment in Receivables Rs. 1,52,000 and cost @ 15% Rs. 22,800; Current Investment in Receivables Rs. 1,84,000; Proposed Investment in Receivables Rs. 3,36,000.

3) Net Benefit Rs. 17,124. Collection policy should be tightened. Reduction in bad debt losses Rs. 12,120; and cost of Average Investment in Receivables Rs.5,004; Loss of Profit on reduced sales Rs. 2,800 and increase in collection charge Rs. 15,000. Average Investment in Present Plan Rs. 84,000 and in proposed plan Rs. 58,978.

4) Net Loss of Rs. 9,986. Present discount policy should not be relaxed. Profit on additional sales Rs. 75,000; Cost savings on average investment in receivables Rs. 11,014; Present Investment Rs. 4,22,222, proposed Rs. 3,12,083. Increase in discount Rs. 96,000.

UNIT 3 INVENTORY MANAGEMENT

Structure **Page Nos.**

3.0 INTRODUCTION

Most firms build and maintain inventories in the course of doing business. Manufacturing firms hold raw material, work in process, finished goods and spares in inventories. Financial services firms hold inventories in the form of portfolio of marketable securities consisting of debt, equity and hybrid instruments. Retails firms (Shops, shopping malls, super markets etc.) hold inventories to meet demand for products from customers.

In case of manufacturing firms inventories represents largest asset category, next only to plant and machinery. The proportion of inventory to total assets ranges between 15 to 30 percent.

Inventory management is not an isolated activity; it requires coordination among the production, purchasing and marketing departments. Decisions regarding of the purchase raw material are taken by the purchasing and production department, whereas work in process inventory is influenced by the production department. Finished goods inventory levels are decided by both the production and marketing departments. Since all these decision end up in tying of resources the financial manager has the responsibility to ensure that the inventories are properly monitored and controlled.

3.1 OBJECTIVES

After going through this unit, you will be able to:

- highlight the need for and nature of inventory;
- explain the techniques of inventory management;
- highlight the need for analysing inventory problems, and
- understand the process for managing inventory.

3.2 REASONS FOR HOLDING INVENTORY

The dictionary defines the word ‘inventory’ as *stock of goods*. But, inventory means such type of assets that will be disposed of in future in the ordinary course of business. Bolten S.E. has defined it as, “inventory refers to the stock-pile of the product a firm is offering for sale and the components that make up the product.” In other words, inventory is used to represent the aggregate of those items of tangible assets which are (i) held for sale in ordinary course of the business; (ii) in process of production for

such sale; or (iii) to be currently consumed in the production of goods or services to be available for sale.

Inventories are held basically to smoothen the operations of the firm. Shortage of inventory at any point would disrupt operations resulting in either idle time for men and machine or lost sales. A manufacturing firm may have inventories of different stages in the production process.

1) Inventory of raw material are held to ensure that the production process is not disrupted due to shortage of raw material. The amount of raw material inventory would depend upon the speed at which the raw material can be procured; the greater the speed, lower would be the level of raw material inventory. Higher the uncertainty in the supply of raw material, higher would be the level of raw material inventory.

2) Work in process (WIP) inventories arise in the process of production. These type of inventories are also referred to as "Process Inventories". In case of simple products the WIP inventories would be less, whereas in case of complex products requiring various sub-processes and sub-assemblies the work in process inventory would be high.

3) Finished goods inventories are held to meet customers requirement promptly. The quantum of finished goods inventory would depend upon:

   - time required to fill an order from the customer. If the products is of such nature that any unexpected demand can be met at short notice the level of inventories would be lower, and
   - diversity of the product line: Firms selling a wide range of products generally need to invest more in finished goods.

4) Inventories are also held, so that the order cost is reduced.

5) Spares: An inventory of spare items which are required for the smooth running of business is also kept.

6) Transaction/Precautionary and Speculative Motives: Inventories which are held for conducting normal day to day business are known as transaction inventory. Precautionary inventories are those inventories which are held to ensure that in case of shortage or adverse price movement, the production process will not be stopped due to the lack of inventory.

3.3 OBJECTIVES OF INVENTORY MANAGEMENT

The twin objectives of inventory management are operational and financial. The operational objective means that the materials and spares would be available in sufficient quantity on time so that work is not disrupted for want of inventory. The financial objective means that investment in inventories should not remain idle and minimum amount of capital should be locked in inventories. The objectives of inventory management are summarised as follows:

Operating Objectives

1) to ensure continuous supply of materials
2) to ensure uninterrupted production
3) to minimise risks and losses
4) to ensure better customer service
5) to avoiding stock out danger.

Financial Objectives

1) to minimise investment
2) to minimise inventory related costs and
3) to ensure economy in purchasing

Factors Affecting Level of Inventory

As stated in the previous sections the firm should maintain its inventory at reasonable level. The quantum of inventory depends upon several factors, some of the important factors are mentioned below:

- **Nature of Business**
- **Inventory Turnover**
- **Nature and Type of Product**
- **Market Structure**
- **Economies of Production**
- **Inventory Costs**
- **Financial Position**
- **Period of Operating Cycle**
- **Attitude of Management**

3.4 TECHNIQUES OF INVENTORY CONTROL

Inventory control signifies a planned approach of ascertaining when to buy, how much to buy and how much to stock so that costs involving buying and storing are optimally minimum, without interrupting production or affecting sales. There are various techniques used to control inventory. These techniques are divided into two categories Traditional Techniques and Modern Techniques

3.4.1 Traditional Techniques

Inventory Control Ratios

For purposes of monitoring the effectiveness of inventory management it is helpful to look at the following ratios and indexes:

$$\text{Overall Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average total inventories at cost}}$$

$$\text{Raw Material Inventory Turnover Ratio} = \frac{\text{Annual consumption of raw material}}{\text{Average raw material inventory}}$$

$$\text{Work-in-process Inventory Turnover Ratio} = \frac{\text{Cost of manufacture}}{\text{Average work in process inventory at cost}}$$

$$\text{Finished Goods Inventory Turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory of finished goods at cost}}$$

$$\text{Average Age of Raw Materials in Inventory} = \frac{\text{Average Raw Material Inventory at cost}}{\text{Average Daily Purchase of Raw Materials}}$$

$$\text{Average Age of Finished Goods Inventory} = \frac{\text{Average finished goods inventory at Cost}}{\text{Average cost of goods manufactured per day}}$$

$$\text{Out-of-stock Iindex} = \frac{\text{Number of times out of stock}}{\text{Number of times requisitioned}}$$

$$\text{Spare Parts Index} = \frac{\text{Value of Spare Parts Inventory}}{\text{Value of Capital Eeuipment}}$$

Two Bin System

Under this system all inventory items are stored in two separate bins (two bins for each type of inventory items). In the first bin a sufficient supply of inventory is stored which is going to be used over a designated period of time. In the second bin a safety stock is maintained which is going to be used during lead times. As soon as material in the first bin is consumed an order for further stock is placed and in the meantime inventory from the second bin is used. On receipt of new order, second bin is restored and the balance is put in the first bin. In this system depletion of inventory in the first bin automatically generates a signal to re-order that particular inventory.

Perpetual Inventory System

In this type of system store balances are computed and recorded after each and every issue and receipt. The main focus of this system is to make available details about the quantity and value of stock at all points of time. If the balance of any item of inventory falls below a particular pre-determined level the order is placed for a further quantity of inventory. In this system physical verification is done after every issue and receipt as a result of which this system is costly, but at the same time materials statement, monitoring and follow up action can be smoothly carried out.

Periodic Inventory System

Under this system all stock levels are reviewed after a fixed time interval, depending upon the importance of the item. Imported items may require a shorter review cycle, whereas slow moving items may require a longer review cycle. In practice the review of stock items takes place at the end of the accounting period. At the time of review, orders are placed for further stocking up to a pre-determined level. Under this system the order point is not actually determined but the time of review itself is an indication to place further orders.

☞ Check Your Progress 1

1) A Publishing house purchases 2,000 units of a particular item per year at a unit cost of Rs. 20. The ordering cost per order is Rs. 50 and carrying cost is Rs. 25. Find the optimal order quantity and minimum total cost including purchase cost.

   If a 3% discount is offered by the supplier for purchases in lots of 1,000 or more, should the publishing house accept the proposal?

2) Keshar Limited uses annually 24,000 kgs. of a chemical which costs Rs. 1.25 per kg. Placing each order costs Rs. 22.50 and the carrying cost is 15% per year of the inventory cost. Find Economic Order Quantity, number or orders to be placed per year and the total inventory cost (including cost of material).

   (a) If procurement time is 12 days and safety stock (minimum stock) 500 kgs. Find the maximum inventory, re-order point and average inventory.

(b) What will be your decision if the company can get a concession of 5% on purchase price if it orders 3000 kgs. or more? (Assume 300 days in a year).

3) Calculate the minimum stock level, maximum stock level and reordering level from the following information.

(a)	Minimum consumption	= 100 units per day
(b)	Maximum consumption	= 150 units per day
(c)	Normal consumption	= 120 units per day
(d)	Re-order period	= 10 – 15 days
(e)	Re-order quantity	= 1,500 units
(f)	Normal Re-order period	= 12 days.

4) Two components A and B are consumed as follows:

Normal usage – 100 units per week each
Minimum usage – 50 units per week each
Maximum usage – 150 units per week each
Re-order quantity – A - 400 units; B - 600 units
Re-order period – A 6 to 8 weeks; B 3 to 5 weeks.

Calculate the following for each component:

(i) Re-order Level
(ii) Minimum Level
(iii) Maximum Level
(iv) Average Stock Level

3.4.2 Modern Techniques

Economic Order Quantity (EOQ)

Graphical Methods:

The economic order quantity can also be determined with the help of a graph. Under this method ordering cost, carrying cost and total inventory costs according to different lot sizes are plotted on the graph. The point at which the line of inventory carrying cost and the ordering cost intersect each other is the economic order quantity. At this point the total inventory cost is also minimum. The function of EOQ is illustrated below in *Figure. 3.1.*

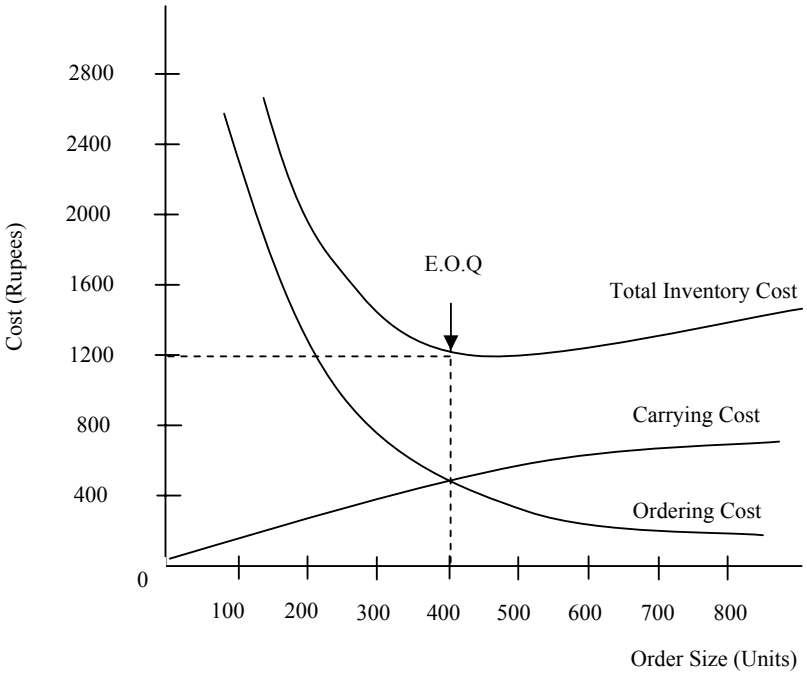

Figure 3.1: Function of E.O.Q

In *Figure. 3.1* costs like carrying, ordering and total cost are plotted on the vertical axis (y) and order size is shown on the horizontal axis (x). From *Figure. 3.1* one can easily see that there is an inverse relationship between inventory carrying cost and ordering cost i.e., inventory carrying cost increases and ordering cost decreases as the order size increases. In the first instance the total cost line decreases as the order size increases, but it starts increasing when decrease in ordering cost is more than off set by the increase in carrying cost.

Assumption of the EOQ Model

The basic EOQ model is based on the following assumption:

1) The forecast usage/demand for a given period, usually one year, is known
2) The usage/demand is even throughout that period
3) Inventory orders can be replenished immediately (There is no delay in placing and receiving orders).

There are two distinguishable costs associated with inventories: costs of ordering and costs of carrying.

Figure 3.1 shows a graph illustrating the behaviour of the carrying cost, the ordering cost, and the sum of these two costs. The carrying cost varies directly with the order size (since the average level of inventory is one-half of the order size), whereas the ordering cost varies inversely with the order size.

EOQ Formula

For determining the EOQ formula we shall use the following symbols:

U = annual usage/demand
Q = quantity ordered
F = cost per order
C = per cent carrying cost
P = price per unit
TC = total costs of ordering and carrying

Given the above assumptions and symbols, the total costs of ordering and carrying inventories are equal to

$$TC = \frac{U}{Q} \times F + \frac{Q}{2} \times P \times C$$

In the equation, the first term on the right-hand side is the ordering cost, obtained as the product of the number of orders (U/Q) and the cost per order (F) and the second term on the right-hand side is the carrying cost, obtained as the product of the average value of inventory holding (QP/2) and the percentage carrying cost C.

The total cost of ordering and carrying is minimised when:

$$Q = \sqrt{\frac{2FU}{PC}}$$

which can be obtained by putting the first derivative of TC with respect to Q and equating it with zero.

$$\frac{dTC}{dQ} = -\frac{UF}{Q^2} + \frac{PC}{2} = 0$$

$$-2UF + Q^2 PC = 0$$

$$Q^2 PC + 2UF$$

$$Q^2 = \frac{2UF}{PC}$$

$$Q = \sqrt{\frac{2UF}{PC}}$$

assuming that the second derivative condition is satisfied.

The formula embodied in the equation is the EOQ formula. It is a useful tool for inventory management. It tells us what should be the order size for the purchase of items and what should be the size of production run for manufactured items.

The EOQ model may be illustrated with the help of the following data relating to the Ace Company.

U = annual sales = 20,000 units
F = fixed cost per order =Rs. 2,000
P = purchase price per unit = Rs. 12
C = carrying cost= 25 per cent of inventory value.

Plugging in these values in eq. (3.2) we get.

$$Q = \sqrt{\frac{2 \times 2{,}000 \times 20{,}000}{12 \times 0.25}} = 5.164$$

Quality Discount and Order Quantity

The standard EOQ analysis is based on the assumption that the price per unit remains constant irrespective of the size of the order. When quantity discounts are available, which is often the case, the price per unit is influenced by the order quantity. This violates the applicability of the EOQ formula. However, the EOQ framework can still be used as a starting point for analysing the problem. To determine the optimal order size when quantity discounts are available the following procedure may be used:

1) Determine the order quantity using the standard EOQ formula assuming no quantity discount, Call it Q*.
2) If Q* enables the firm to get quantity discount then it represents the optimal order size.
3) If Q* is less than the minimum order size required for quantity discount (call it Q′) compute the change in profit as a result of increasing the order quantity from Q* to Q' as follow:

$$\Delta\pi = UD + \left[\frac{U}{Q^*} - \frac{U}{Q'}\right]F - \left[\frac{Q'(P-D)C}{2} - \frac{Q^* PC}{2}\right]$$

where $\Delta\pi$ = change in profit.
U = annual usages/demand
D = discount per unit when quantity discount is available
Q* = economic order quantity assuming no quantity discount
Q′ = minimum order size required for quantity discount
F = fixed cost of placing an order
P = unit purchase price without discount
C = inventory carrying cost expressed as a percentage.

On the right-hand side of the equation, the first term represents savings in price, the second term represents savings in ordering cost, and the third term represents the increase in carrying cost.

4) If the change in profit is positive, Q′ represents the optimal order quantity. If the change in profit is negative, Q* represents the optimal order quantity.

To illustrate the above procedure, consider the following data pertaining to Quantum Ltd.

U = annual usage=10,000 units
F = foxed cost per order =Rs. 150
P = purchase price per unit =Rs. 20
C = carrying cost=25 percent of inventory value
Q′ = minimum order size required for quantity discount=1,000 units
D = discount per unit =Re.1.

The EOQ assuming no quantity discount is

$$Q^* = \sqrt{\frac{2FU}{PC}} = \sqrt{\frac{2 \times 150 \times 10{,}000}{20 \times 0.25}} = 75 \text{ units}$$

Since Q* is less than Q′ (1,000), the change in profit as a result of increasing the order quantity from Q* to Q′ is

$$UD + \left[\frac{U}{Q^*} - \frac{U}{Q'}\right]F - \left[\frac{Q'(P-D)C}{2} - \frac{Q^*PC}{2}\right]$$

$$= 10{,}000 \times 1 + \left[\frac{10{,}000}{775} - \frac{10{,}000}{1{,}000}\right]150$$

$$- \left[\frac{1{,}000(20-1)0.25}{2} - \frac{775 \times 20 \times 0.25}{2}\right]$$

= 10,000 + 435 – (2,375 – 1,938)
= Rs. 9,998.

Since the change in profit is positive, Q′=1,000 represents the optimal order quantity. It should be noted that the above procedure is based on the principle of marginal analysis. This involves comparing incremental benefits with incremental costs in moving from one level of inventory to another. This principle may be used to compare a proposed order quantity with the present order quantity and more generally for comparing any set of alternatives.

Levels

Mini-Max System

Under this method the maximum and minimum level for each item of inventory are fixed. These levels serve as a basis for initiating action so that the quantity of each item is controlled. These levels are not permanent and likely to change with the level of activity. The maximum level indicates the maximum quantity of an item of inventory which can be held at a point of time. The maximum level of inventory would depend upon the following factor:

- availability of storage space
- lead time (time required in receiving the goods ordered)
- availability of working capital
- average rate of consumption of material
- cost of storage and insurance
- risk of obsolescence and deterioration

- quantity discounts

Minimum level indicates the quantitative balance of an item of inventory, which must be maintained in hand at all times. It is a level below which the inventories should not fall. This level of inventory is held to avoid stock out and consequent stoppage of production. The minimum level would depend upon:

- rate of consumption of material
- the maximum and minimum time required to acquire fresh supplies
- the re-order level.

Re-order Period (ROP)

The standard EOQ model assumes that materials can be procured instantaneously and hence implies that the firm may place an order for replenishment when the inventory level drops to zero. In the real world, however, procurement of materials takes time and hence the order level must be such that the inventory at the time of ordering suffices and meet the needs of production during the procurement period which is also known as Lead Time.

If the usage rate of materials and the lead time for procurement are known with certainly then the ordering level would simply be:

Lead-time in days for procurement X Average daily usage

When the usage rate and lead time are likely to vary: the reorder level should be higher than the normal consumption period requirement during the procurement period in order to provide a measure of safety in the face of variability of usages and lead time. Put differently, the reorder level should be equal to:

Normal consumption + Safety stock

Safety Stock

What should be the level of safety stock? In a simple situation where only the usage rate is variable and the maximum usage rate can be specified, the safety stock required to seek total protection against stock out is:

(Maximum usage rate – Average usage rate) × Lead time

When both the lead time and usage rate vary, which is often the case and the range of variation is wide, complete protection against stockout may require an excessively large safety stock. For example, if the lead time various between 60 days and 180 days with an average value of 90 days and the usage rate varies between 75 units and 125 units per day with an average value of 100 units per day, a safety stock of 13,500 units is required for complete protection against stockout. This has been worked out as follows:

Maximum possible usage	-	Normal or Average usage
Maximum daily usage	-	Average or Normal daily usage
X Maximum lead time	×	Average lead time
125 × 180	-	100 × 90 = 13,500

Since inventory-carrying costs are proportional to the level of inventories carried, it rarely makes sense to seek total protection against stockout. In view of the trade-off between stockout cost and inventory carrying cost, the optimal level of safety stock is usually much less than the level of safety stock required to achieve total protection against stockout.

A manufacturing company will require 50,000 units of a product during the next year. The cost of processing an order is Rs.20 and the carrying cost per units is 50 paise per year. Lead-time of an order is 5 days and the company will keep a safety stock of two days usage.

You are required to calculate – (i) Economic Order Quantity; (ii) Re-order Point; (iii) Minimum Inventory; (iv) Maximum inventory and (v) average Inventory. (Assume 250 days in a year.)

Solution

(i) Economic Order Quantity

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

Where; R = Annual Requirements or Usage
O = Ordering cost per order
C = Carrying cost per unit per year

$$EOQ = \sqrt{\frac{2 \times 50{,}000 \times Rs.20}{Re.0.5}}$$

$$= \sqrt{40{,}00{,}000} = 2{,}000 \text{ Units}$$

(ii) Re-order Point

R.O.P. = (L× UR) + S
Where; L = Lead Time;
U = Usage Rate (50,000 ÷ 250) = 200 (units per day);
S = Safety Stock
R.O.P. = (5 × 200) + (2 × 200)
= 1,000 + 400 = 1,400 Units

(iii) Minimum Inventory

Minimum Inventory is the Safety Stock kept by the company, which are 400 units. If there is no safety stock, minimum inventory will be zero.

(iv) Maximum Inventory

Maximum Inventory = EOQ + Safety Stock
= 2,000 + 400
= 2,400 units.

(v) Average Inventory

$$\frac{\text{Maximum Inventory} + \text{Minimum Inventory}}{2}$$

$$\frac{2{,}400 + 400}{2} = 1{,}400 \text{ Units}$$

Order Point Formula

The analysis discussed above tends to be somewhat cumbersome when probability distributions are most complex and dependent and multi-period cases are involved. In view of this many firms would find the following formula helpful for calculating the reorder point.

$$\text{Recorder Point} = S(L) + \sqrt{SR(L)}$$

Where S = Usage
L = lead time needed to obtain additional inventory when the order is placed
R =average quantity ordered
F = stockout acceptance factor.

The value of F, the stockout acceptance factor, depends on the stockout percentage rate.

Selective Inventory Control (Classification)

ABC Analysis:

ABC analysis [Always Better Control] is an application of the principle of 'Management by Exception' to the field of inventory control. If we look at the inventory mix of a firm, it would constitute of hundreds of items. Most of these items would be inexpensive and the frequency of their use would be less. The remaining items would be expensive, more frequently used and account for large proportion of firm's investment in inventories.

It would be an expensive and cumbersome act to adopt a common policy and determination of economic order quantity and reorder point for management of all these items of inventory. In this technique all the items of inventory are classified in three categories viz., A, B and C based on the usage rate, rupee value and criticality of the item.

- **A** category items are those inventory items which have maximum usage rate and constitute 70% to 80% of inventory value, but only 5% to 10% of the inventory volume. These type of inventories requires frequent monitoring and strict control.
- **B** category items are those inventory items which have moderate value and usage rate and constitute 20% to 25% of inventory value, but only 20% to 30% of the inventory volume. These types of inventories require less monitoring and control.
- **C** category items are of low or negligible value and usage rate. The remaining items of inventory representing 5% to 10% of inventory value, but 60% to 70% of the total quantity of inventory fall in this category and require general control.

Process of ABC Analysis

- **Classification:** On the basis of expected use, the items of inventory are classified according to their categories and per unit Price of each item is determined.
- **Ascertainment of Total Cost:** The total cost is calculated by multiplying the expected units to be used by the per unit cost.
- **Rank Determination:** Cost-wise rank is determine for each item of inventory. First rank is assigned to the item with the highest total cost.
- **Computation of Ratio or Percentage:** Two ratios/percentages are calculated (i) Percentage of number of units of each item to total units of all items. (ii) Total cost of each item to the total cost of all items.
- **Determination of ABC Category:** ABC categories are formed by combining the items on the basis of their relative values.

Example 2.1: Dinesh Limited is considering selective control for its inventories. Using the following datas, prepare the ABC plan.

Items	A	B	C	D	E	F	G
Unit	8,000	15,000	5,000	7,5000	5,000	7,000	2,500
Unit Cost (Rs.)	5.50	1.70	30.40	1.50	0.65	5.14	51.20

Solution:

ABC Analysis

Item	Per Unit Cost (Rs.)	Inventory			Total Value			Category
		Units	% of Total	Cumulative %	Total Cost Rs.	% of Total	Cumulative %	
C	30.40	5,000	10		1,52,000	38		
			15%			70%		A
G	51.20	2,500	5	15%	1,28,000	32	70%	
A	5.50	8,000	16		44,000	11		
			30%	45%		20%	90%	
F	5.14	7,000	14		36,000	9		B
B	1.70	15,000	30		25,000	6.38		
D	1.50	7,500	15	55% 100%	11,250	2.80 10%	100%	C
E	0.65	5,000	10		3,250	0.82		
Total		50,000	100%		4,00,000	100%		

VED Analysis:

VED (Vital, Essential, Desirable) analysis is a technique used for spare part inventory analysis and is widely used in the automobile industry specially for the maintenance of the spare parts inventory. According to this technique, inventory items are classified as follows:

- **Vital (V)** items constitute such items of inventory, which are vital for continuous operations. Shortage or absence of these items will bring the production activity to a halt. These items of inventory are critical for continuous production and therefore require close monitoring.
- **Essential (E)** items are those items of inventory, which are essential for continuous production. The difference between vital and essential items is that the shortage of essential items can be tolerated for a few hours viz., it will not bring the production process to a halt. The level of these type of inventory is moderately low.
- **Desirable (D)** items do not have any immediate impact on the production process, hence inventory of these items may or may not be maintained.

In VED analysis the focus is not on the value of the inventory, but the focus is on their likely impact on production.

SED Analysis

SDE (Scarce, Difficult and Easy) analysis evaluates the importance of inventory items on the basis of their availability. As per SDE analysis the inventory items are grouped into the following categories:

- **Scarce (S)** items are those items which are in short supply. Most of the time these items are important and essential for continuous production.
- **Difficult (D)** items are those items which can not be produced easily.

- **Easy (E)** items are those items which are readily available in the market.

In SDE analysis the main focus is on the availability of the inventory. This type of analysis is resorted to when the markets are regulated and input and output is controlled by the government.

FSN Analysis:

Under this method inventory items are classified according to the usage/consumption pattern. They are classified as follows:

- **Fast Moving (F)** items are stored in large quantities as their usage rate is high. Special attention is given to the inventory level of these types of items.
- **Slow Moving (S)** items are not frequently required by the production department, hence moderate quantities with moderate supervision are maintained.
- **Non Moving (N)** items are rarely required by the production department, hence small number of items are kept in stores and less supervision is required for these kind of inventory items.

In this method the focus is on the frequency of usage of a particular item.

☞ Check Your Progress 2

1) A Precision Engineering Factory consumes 50,000 units of a component per year. The ordering, receiving and handling costs are Rs.3 per order while the trucking costs are Rs.12 per order. Further details are as follows:

   Interest cost Rs. 0.06 per unit per year.
   Deterioration and obsolescence cost Rs. 0.004 per unit per year.
   Storage cost Rs. 1,000 per year for 50,000 units.
   Calculate the economic order quantity.

2) A company requires 1,250 units per month of a particular item. Ordering costs is Rs.50 per order. The carrying cost is 15% per year, while unit cost of the item is Rs. 10.

Determine economic lot size and minimum total variable cost.

3) The following relations to inventory cost have been established for ABC Ltd.

   (a) Orders must be placed in multiples of 100 units.
   (b) Requirement for the year are 3,00,000 units.
   (c) The purchase price per unit is Rs. 3.
   (d) Carrying cost is 25% of the purchase price of goods.
   (e) Cost per order placed is Rs. 20.
   (f) Desired safety stock is 10,000 units, this amount is on hand initially.
   (g) Three days are required for delivery.

   Calculate the following:

   (i) E.O.Q.
   (ii) How many orders should the company place each year.
   (iii) At what inventory level should an order be placed?

3.5 SUMMARY

Inventories constitute a significant portion of the current assets ranging form 40 to 60% for manufacturing companies. The manufacturing companies hold investments in the form of raw material, work in process and finished goods. The three main motives

for holding inventories are transaction, precautionary and speculative. The various factors which need to be considered while formulating inventory policy are:

(a) Costs
(b) Returns
(c) Risk Factors.

There are two type of costs associated with inventory maintenance which are:
(a) Ordering Costs
(b) Carrying Costs.

The Economic Order Quantity (EOQ) is that order quantity which minimises the sum of ordering and carrying cost. The inventory level at which the firm places order for further inventory is known as reorder point and it depends on:

(a) lead time
(b) the usage rate.

There are many inventory control systems, the most widely used one is ABC and FSN System.

3.6 SELF-ASSESSMENT QUESTIONS/EXERCISES

1) Distinguish between process or movement inventories and organisation inventories.

2) What purpose is served by inventories?

3) What costs are incurred in the context of inventory managements?

4) What assumptions underlie the basic EOQ model?

5) What is the formula for EOQ? Device it.

6) How would you go about determining the optimal order size when quantity discount is available? Illustrate your approach with a suitable example.

7) What modification is required in the basic EOQ analysis to cope with the problem of inflation?

3.7 SOLUTIONS/ANSWERS

Check Your Progress 1

1) EOQ 4.226 units

2) EOQ 1,000 units; Minimum Total Variable Cost Rs. 1,500

3) (i) 4,000 units
(ii) 75
(iii) 12,500

Assume 360 days in a year.

Check Your Progress 2

1) EOQ – 200 units; Total Cost Rs. 41,000; Net increase in total cost Rs. 325, (Not to accept the offer.)

2) EOQ – 2,400 kg; No. of orders 10; Total Purchase cost Rs. 30,450.

   (a) Maximum Inventory 2,900 kg; ROP 1,460 kg; Average Inventory 1,700 kg.
   (b) Discount should be availed; Saving Rs. 1,503.

3) ROL– 2,250 units; Minimum Level – 810 units; Maximum Level – 2,750 units.

4) (i) A –1,200; B –750
   (ii) A – 500; B – 350
   (iii) A – 1,300; B – 1200
   (iv) A – 900; B – 775.