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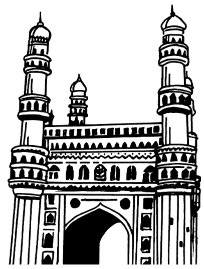

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## 1.1 Finance Function

### 1.1.1 Nature and Scope

**Q1. Define the term finance function. Explain the nature of finance function.**

*Ans :* **(Dec.-18, Feb.-17)**

Finance function is a primary function among all other business functions because every firm requires finance in order to develop and expand its business. Finance can be raised from different sources i.e., short-term or long-term and internal or external sources. The finance function of a firm must be effectively managed in order to ensure proper utilization of funds and repayment of funds on time.

**Nature**

Finance is an important field of business management. It is a term which is referred as administration of flow of money in organization. Finance or financial management is an area which is very useful for managing the business smoothly. Finance is different from accounting but it uses information of accounting for making effective decisions. Accounting deals with recording, reporting and evaluating the business transactions whereas finance is termed as managerial or decision making process.

Economics deals with evaluating the allocation of resources in economy and also related to cost and profits, demand and supply and production and consumption. Economics also consider those transactions which involves goods and services either in return of cash or not.

Economics is easy to understand when divided into two parts,

**(i) Microeconomics**

It is also known as price theory of the firm. Microeconomics explains the behaviour of rational persons in making decisions related to pricing and production.

**(ii) Macroeconomics**

Macroeconomics is a broad concept as it takes into consideration the overall economic situation of a nation. It uses Gross National Product (GNP) and useful in forecasting.

**Q2. Define financial management. Explain the nature and scope of financial management.**

*Ans :* **(Dec.-18, Aug.-15, Aug.-13, Aug.-12, June-12)**

**Meaning of Financial Management**

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

**Definitions of Financial Management**

(i) **According to Solomon,** "Financial management is concerned with the efficient use of an important economic resource, namely, capital funds."

(ii) **According to J. L. Massie,** "Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operation."

**(iii) According to Weston,** "Financial management is an area of financial decision making harmonising individual motives and enterprise goals".

**(iv) According to JF Bradley,** "The area of the business management devoted to a judicious use of capital and careful selection of source of capital in order to enables a spending unit to move in the direction of reaching its goals".

### Nature of Financial Management

On the basis of the above definitions, the following are the main characteristics of the financial management:

**1. Analytical Thinking**

Under financial management financial problems are analyzed and considered. Study of trend of actual figures is made and ratio analysis is done.

**2. Continuous Process**

previously financial management was required rarely but now the financial manager remains busy throughout the year.

**3. Basis of Managerial Decisions**

All managerial decisions relating to finance are taken after considering the report prepared by the finance manager. The financial management is the base of managerial decisions.

**4. Maintaining Balance between Risk and Profitability**

Larger the risk in the business larger is the expectation of profits. Financial management maintains balance between the risk and profitability.

**5. Coordination between Process**

There is always a coordination between various processes of the business.

**6. Centralized Nature**

Financial management is of a centralized nature. Other activities can be decentralized but there is only one department for financial management.

### Scope of Financial Management

Financial management, at present is not confined to raising and allocating funds. The study of financial institutions like stock exchange, capital, market, etc. is also emphasized because they influenced under writing of securities & corporate promotion. Company finance was considered to be the major domain of financial management.

The scope of this subject has widened to cover capital structure, dividend policies, profit planning and control, depreciation policies. Some of the functional areas covered in financial management are discussed as such-

**1. Determining financial needs**

A finance manager is supposed to meet financial needs of the enterprise. For this purpose, he should determine financial needs of the concern. Funds are needed to meet promotional expenses, fixed and working capital needs. The requirement of fixed assets is related to types of industry.

A manufacturing concern will require more investments in fixed assets than a trading concern. The working capital needs depend upon scale of operations. Larger the scale of operations, the higher will be the needs for working capital. A wrong assessment of financial needs may jeopardize the survival of a concern.

**2. Choosing the sources of funds**

A number of sources may be available for raising funds. A concern may be resort to issue of share capital and debentures. Financial institutions may be requested to provide long-term funds. The working capital needs may be met by getting cash credit or overdraft facilities from commercial bands. A finance manager has to be very careful & cautions in approaching different sources.

**3. Financial analysis and interpretation**

The analysis & interpretation of financial statements is an important task of a finance manager. He is expected to know about the profitability, liquidity position, short term and long-term financial position of the concern.

For this purpose, a number of ratios have to be calculated. The interpretation of various ratios is also essential to reach certain conclusions Financial analysis and interpretation has become an important area of financial management.

**4. Cost-volume profit analysis**

This is popularly known as "CVP relationship". For this purpose, fixed costs, variable costs and semi variable costs have to be analyzed. Fixed costs are more or less constant for varying sales volumes. Variable costs vary according to the sales volume. Semi-variable costs are either fixed or variable in the short-term.

The financial manager has to ensure that the income of the firm will cover its variable costs, for there is no point in being in business, if this is not accomplished. Moreover, a firm will have to generate an adequate income to cover its fixed costs as well. The financial manager has to find out the break-even point that is, the point at which the total costs are matched by total sales or total revenue.

**5. Working capital management**

Working capital refers to that part of firm's capital which is required for financing short-term or current assets such as cash, receivables and inventories. It is essential to maintain proper level of these assets. Finance manager is required to determine the quantum of such assets.

**6. Dividend policy**

Dividend is the reward of the shareholders for investments made by them in the shares of the company. The investors are interested in earning the maximum return on their investments whereas management wants to retain profits for future financing.

These contradictory aims will have to be reconciled in the interests of shareholders and the company. Dividend policy is an important area of financial management because the interest of the shareholders and the needs of the company are directly related to it.

**7. Capital budgeting**

Capital budgeting is the process of making investment decisions in capital expenditures. It is an expenditure the benefits of which are expected to be received over a period of time exceeding one year. It is expenditure for acquiring or improving the fixed assets, the benefits of which are expected to be received over a number of years in future. Capital budgeting decisions are vital to any organization. Any unsound investment decision may prove to be fatal for the very existence of the concern.

---

**Q3. Why is finance referred to as 'life blood of an organization'? What is its relevance?**

*Ans :* **(Feb./March-16)**

**Finance as 'Life Blood of an Organization'**

In every business, finance is considered as the life blood of a business. Just like how the blood circulation is essential for maintaining good health of human beings, finance is essential for business success. If firms have adequate funds then they can smoothly operate their business. Without adequate amount of fund, no business can survive in the market. Right from the promotion or idea generation till the development of quality products for the customers, adequate financial assistance is required. Therefore, extreme care should be taken by the academicians and managers for financial management.

**Relevance**

The following points highlight the relevance of finance in organizational activities,

(i) Efficientive management of financial needs can increase the effectiveness of financial planning. It is also used for the promotion and the development of a business.

(ii) It raises the funds at low cost of capital.

(iii) It ensures the optimum utilization and the allocation of funds.

(iv) It contributes in making sound financial decisions.

(v) Through financial control, profitability of the firm can be improved.

(vi) Finance maximizes the wealth of shareholders and in turn brings the economic development of the country.

## 1.2 Evolution of Finance Function

**Q4. State the evolution of financial management.**

*Ans :* **(Dec.-18)**

Financial management has emerged as a distinct field of study, only in the early part of this century, as a result of consolidation movement and formation of large enterprises. Its evolution may be divided into three phases (some what arbitrary) - viz.,

1. The Traditional phase,
2. The Transitional phase and
3. The Modern phase.

**1. The Traditional Phase**

This phase lasted for about four decades. Its finest expression was shown in the scholarly work of Arthur S. Dewing, in his book titled "the Financial Policy of Corporation in 1920s." In this phase the focus of financial management was on four selected aspects.

(i) It treats the entire subject of finance from the outsider's point of view (investment banks, lenders, other) rather than the financial decision-maker's view point in the firm.

(ii) It places much importance on corporation finance and too little on the financing problems of non-corporate enterprises.

(iii) The sequence of treatment was on certain episodic events like formation, issuance of capital, major expansion, merger, reorganisation and liquidation during the life cycle of an enterprise.

(iv) It placed heavy emphasis on long-term financing, institutions, instruments, procedures used in capital markets and legal aspects of financial events. That is it lacks emphasis on the problems of working capital management.

It was criticized throughout the period of its dominance, but the criticism is based on matters of treatment and emphasis. Traditional phase was only outsiders looking approach, due to its over emphasis on episodic events and lack of importance to day-to-day problems.

**2. The Transition phase**

It began around the early 1940's and continued through the early 1950's. The nature of financial management in this phase is almost similar to that of earlier phase but more emphasis was given to the day-to-day (waking capital) problems faced by the finance managers. Capital budgeting techniques were developed in this phase only. Much more details of this phase are given in the book titled "Essays on Business Finance."

**3. The Modern Phase**

It began in the mid 1950's. It has showed commendable development with a combination of ideas from economic and statistics that has lead financial management to be more analytical and quantitative.

The main issue of this phase was rational matching of funds to their uses, which leads to the maximisation of shareholders' wealth. This phase witnessed significant developments. The areas of advancements are: capital structure. The study says the cost of capital and capital structure are independent in nature, Dividend policy, suggests that there is an effect of dividend policy on the value of the firm.

### 1.2.1 Its new role in the contemporary scenario

**Q5. Explain the new role of finance function in the current contemporary scenario.**

*Ans :* **(Feb.-17, March-15)**

**Role of Finance Function**

Due to recent trends in business environment, financial managers are identifying new ways through which finance function can generate great value to their organizations. Organizations are transferring their focus from regulatory reporting to providing information required for smoothly running the business.

Financial managers must identify the measures and analytical methods which are required in decision making. Advanced decision support capability for finance is developed by financial areas is termed as financial analytics.

**Current Business Environment**

The progress in financial analytics is because of development of new business models, trends in role of traditional finance department, alternations in business processes and progress in technology. Finance function in this vital environment emerged with enormous opportunities and challenges.

**New Business Models**

At the time when internet was introduced, three new e-business models have evolved. They are business-to-business (B2B), business- to-consumer (B2C) and business-to-employees (B2E). Future of financial analytics can be improved with the help of these new models of business.

Traditionally, financial analytics was emphasizing on utilization of tangible assets like cash, machinery etc., whereas some companies are mainly focused on intangible assets which are not easy to evaluate and control. Hence financial analytics solved this problem by,

- Recognizing the complete performance of the organization
- Determine the source through which value of intangible assets can be evaluated and increased
- Predict the trends in market
- The abilities of information system is encouraged
- Minimizes the operating costs and enterprise-wide investments are effectively controlled and upgrade the business processes.

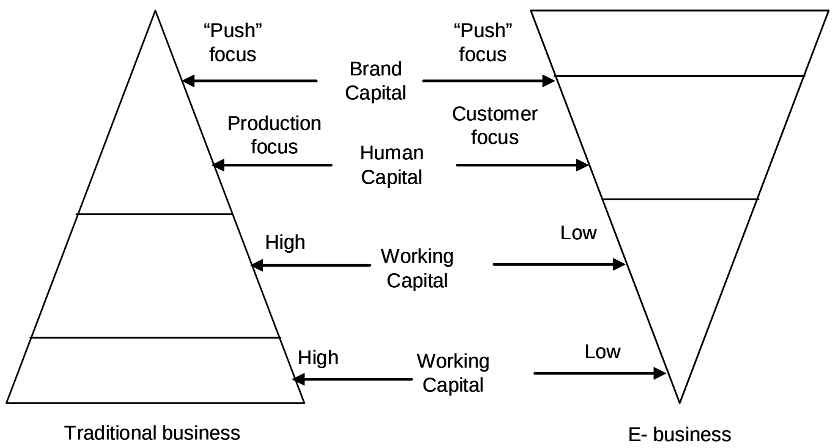


**Fig. : Impact of E-business on Focus of Financial Analytics**

## Changing Role of the Finance Department

The role of finance function has been changing simultaneously with the changes in economy. These changes are mainly due to Enterprise Resource Planning (ERP), shared services and alterations in its reporting role.

In the field of transaction processing, the role of financial staff has been widened up because of automated financial transactions. Now financial executives are not just processing and balancing transactions but they are focusing on decision-making processes.

International organizations are facilitating their customers by providing financial information and facility to update both finance and non-finance functions from any place around the world. It resulted in the development of decision support in the organization.

Finance professionals are held responsible for supplying suitable analytical tools and methods to decision makers.

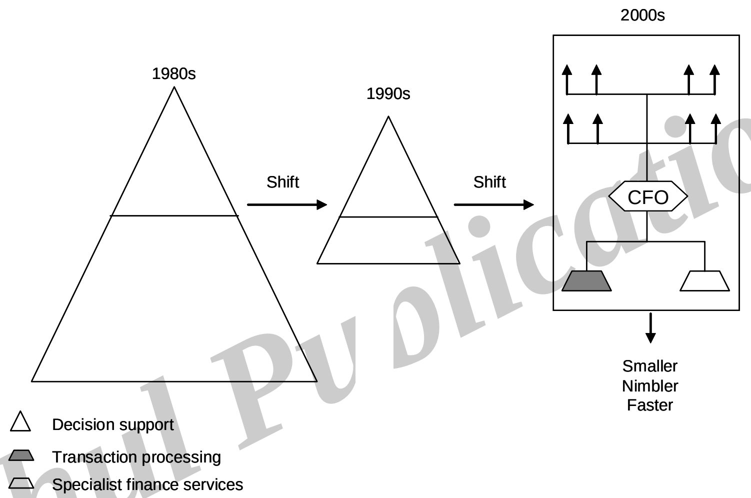


**Fig. : Reshaping the Finance Function**

### (i) Business Processes

With the evolution of business processes, queries regarding business are becoming more complicated. In order to solve, it requires analytics with high level of data integration and organizational collaboration. In the last few decades, organizations are replacing function based legacy systems with new methods like ERP, BRP, etc., in order to get accurate and consistent financial and non-financial information.

In 1990s, organizations were applying some modern systems like supply chain management, Customer Relationship Management (CRM) and many others to encourage their transactions. Overall organizations were building strong relations with customers.

### (ii) Technology

With the developments in technology, ERP, internet, data warehousing have also improved. Internet helps in increasing the sources of acquiring financial data, whereas ERP vendors are building their own financial analytics which helps in evaluating the performance, planning and estimating, management and statutory reporting and financial consolidation.

Till now, data warehousing solutions used to emphasize on developing elements of analytical infrastructure such as data stores, data marts and reporting applications but in future these data warehousing provide advanced analytical abilities to data stores.

**(iii) Integrated Analytics**

To survive in this competitive environment, organizations must have advanced level of integrated financial analytics. Integrated financial analytics are useful for organizations to evaluate, combine and share information inside and outside the organization.

Hence, with the progress in role of finance function, the financial analytics are used in organizations effectively.

**Q6. Explain the functions of financial manager.**

*Ans :* **(July-13, Aug.-12, June-12)**

A financial manager is a person who is liable for undertaking all the functions related to finance. He plays a very important role in the organization.

The role of financial manager has widened due to changes in the business environment. The demand for financial planning and control has increased due to changes like increase in industrialization, increase in large scale units, high competition etc. In the present conditions, the financial manager is executing the following functions,

**(i) Financial Forecasting and Planning**

Financial planning and estimating funds in future is an important function of a financial manager. The financial manager must determine the financial requirements of the firm which are required for acquiring fixed assets and for maintaining adequate working capital.

**(ii) Acquisition of Funds**

Financial manager needs to acquire funds after making appropriate financial plans. Funds can be acquired from different sources such as shares, debentures, banks, financial institutions etc. Financial manager needs to select an appropriate source, so that it does not create any problems in future. He must evaluate benefits and drawbacks of available sources before making a final decision.

**(iii) Investment of Funds**

Funds acquired must be used in a profitable manner. The cost incurred in acquiring funds must be compared with the returns they yield. For this purpose the capital budgeting technique is very useful. The goal of an organization is to maximize profits which can be attained only when funds are properly utilized and are not left idle. It is necessary for a financial manager to consider the principles of safety, liquidity and soundness at the time of investing funds.

**(iv) Helps in Valuation Decisions**

In the present competitive environment, many mergers and consolidations occurs. It is the duty of financial manager to help the management in valuing shares. But in order to value shares and assets, financial manager must have an adequate knowledge about the methods of valuing shares, so- that accurate values are obtained.

**(v) Maintain Proper Liquidity**

Every organization must have some liquid assets such as cash to meet its daily requirements. Firms need cash for performing its day to day activities such as payment of workers, purchase of raw material, other miscellaneous expenses etc. It is the responsibility of financial manager to identify the requirement of liquid assets and maintain adequate liquid assets in the organization.

## 1.3 GOALS OF FINANCE FUNCTION

**Q7. Explain in detail the goals of finance function.**

**(OR)**

**Discuss the objectives of financial management in modern scenario.**

**(OR)**

**State the various objectives of financial management.**

*Ans :* **(Nov.-20, Mat-19, Dec.-19, July-14, July-10)**

Financial management is concerned with procurement and use of funds. Its main aim is to use business funds in such a way that the firm's value earnings are maximised. There are various alternatives available for using business funds. Each alternative course has to be evaluated in detail. The pros and cons of various decisions have to looked into before making a final selection. The decisions will have to take into consideration the commercial strategy of the business. Financial management provides a framework for selecting a proper course of action and deciding a viable commercial strategy. The main objective of a business is to maximise the owner's economic welfare. This objective can be achieved by :

1. Profit Maximization
2. Wealth Maximization

### 1. Profit Maximization

Profit earning is the main aim of every economic activity. A business being an economic institution must earn profit to cover its costs and provide funds for growth. No business can survive without earning profit. Profit is a measure of efficiency of a business enterprise. Profits also serve as a protection against risks which cannot be ensured. The accumulated profits enable a business to face risks like fall in prices, competition from other units, adverse government policies etc. Thus, profit maximization is considered as the main objective of business. The following arguments are advanced in favour of profit maximisation as the objective of business:

i) When profit-earning is the aim of business then profit maximization should be the obvious objective.

ii) Profitability is a barometer for measuring efficiency and economic prosperity of a business enterprise, thus, profit maximisation is justified on the grounds of rationality.

iii) Economic and business conditions do not remain same at all the times. There may be adverse business conditions like recession, depression, severe competition etc. A business will be able to survive under unfavourable-situation, only if it has some past earnings to rely upon. Therefore, a business should try to earn more and more when situation is favourable.

iv) Profits are the main sources of finance for the growth of a business. So, a business should aim at maximization of profits for enabling its growth and development.

v) Profitability is essential for fulfilling social goals alss. A firm by pursuing the objective of profit maximization also maximises socio-economic welfare.

**Draw Backs**

**i) Ambiguity**

The term 'profit' is vague and it cannot be precisely defined. It means different things for different people

**ii) Ignores Time Value of Money**

Profit maximization objective ignores the time value of money and does not consider the magnitude and timing of earnings. It treats all earnings as equal though they occur in different periods. It ignores the fact that cash received today is more important than the same amount of cash received after, say, three years.

**iii) Ignores Risk factor**

It does not take into consideration the risk of the prospective earnings stream. Some projects are more risky than other. The earning streams will also be risky in the former than the latter

**iv) Dividend Policy**

The effect of dividend policy on the market price of shares is also not considered in the objective of profit maximization. In case, earnings per share is the only objective then an enterprise may not think of paying dividend at all because retaining profits in the business or investing them in the market may satisfy this aim.

**2. Wealth Maximization**

Wealth maximization is the appropriate objective of an enterprise. Financial theory asserts that wealth maximization is the single substitute for a stockholder's utility. When the firm miximizes the stockholder's wealth, the individual stock holder can use this wealth to maximise his individual utility

A stockholder's current wealth in the firm is the product of the number of shares owned, multiplied with the current stock price per share

**Criticism of Wealth Maximization**

The wealth maximization objective has been criticised by certain financial theorists mainly on following accounts

i) It is prescriptive idea. The objective is not descriptive of what the firms actually do.

ii) The objective of wealth maximisation is not necessarily socially desirable

iii) There is some controversy as to whether the objective is to maximise the stockholders wealth or the wealth of the firm which includes other financial claimholders such as debenture holders preferred stockholders etc.,

iv) The objective of wealth maximization may also face difficulties when ownership and management are separated as is the case inn most of the large corporate form of organisations. When managers act as agents of the real owners (equity shareholders and the managerial interests. The managers may act in such a manner which maximises the managerial utility but not the wealth of stockholders or the firm.

**Q8. "The profit maximization is not an operationally feasible criterion". Do you agree? Illustrate your answer / with suitable numerical examples.**

*Ans :* **(Feb.-17)**

Yes, I agree that profit maximization is not an operationally feasible criterion which cannot maximize the owner's economic welfare and even fail to rank alternative courses of action in terms of economic efficiency.

**Illustration**

**Let us consider the profits earned by two different companies in our example.**

| Period | Company P | Company Q |
|---|---|---|
| 2003 | 10,000 | – |
| 2004 | 20,000 | – |
| 2005 | 30,000 | 45,000 |
| 2006 | 40,000 | 55,000 |
| **Total Profit** | **1,00,000** | **1,00,000** |

The total profit earned by both the companies is same. But it differs in one important aspect i.e., company P generate higher returns in previous years whereas company Q generate profits only in 2005-06. Hence, we could not say that profits of these companies are same. It is the fact that profits earned earlier are more attractive because they can be reinvested to earn more money. In this example we can observe that profit maximization criterion does not consider the difference between the profit earned in different time periods. Practically, the benefits received previously must be evaluated significantly higher than the same benefits received in subsequent periods.

## 1.4 Maximizing vs. Satisfying

**Q9. (a) How stock price maximization benefits the society.**

**(b) Explain the managerial actions to maximize share holders wealth.**

*Ans :*

**(a) Stock Price Maximization and Social Welfare**

As shareholders are the real owners of the organization, they appoint managers to take important decisions with the objective of maximizing shareholder's wealth. Though organizations have many other objectives, but maximizing stock price is considered to be an important objective of all for many firms.

It is advantageous for society, if firm maximize its stock price. But, firm must not have any intentions of forming monopolistic market, creating pollution and avoiding safety measures. When stock prices are maximized, it benefits society by,

1. **To Greater Extent the Owners -of Stock are Society**

   In past, ownership of stock was with wealthy people in society. But now, with the tremendous growth of pension funds, life insurance companies and mutual funds, large group of people in society have ownership of stock either directly or indirectly. Hence, when stock price is increased, it ultimately improves the quality of life for many people in society.

2. **Consumers Benefit**

   It is necessary to have an effective, low-cost businesses which manufacture good quality of goods and services at the cheapest cost possible to maximize stock price. Companies which are interested in maximizing stock price must satisfy all requirements of customers, provide good services and innovate new products finally, it must increase its sales by creating value for customers.

   Some people believe that firms increase the prices of goods while maximizing stock price. But it is not true, in order to survive in competitive market firms does not increase prices otherwise they may lose their market share.

3. **Employees Benefit**

   In past years, it was an exception that decrease in level of employees lead to increase in stock price, but now a successful company which can increase stock price can develop and recruit more employees which ultimately benefits the society. Successful companies take advantage of skilled employees and motivated employees are an important source of corporate success.

**(b) Managerial Actions to Maximize Shareholder's Wealth**

In order to identify the steps taken by managers to maximize shareholder's wealth, the ability of the organization to generate cash must be known. Cash flows can be determined in three ways, they are,

i) Unit sales

ii) After-tax operating margins and

iii) Capital requirements.

In first determinant, managers can increase the level of their sales either by satisfying customers or by luck, but which will not continue in long run.

In second determinant, managers can generate cash flows by increasing operating profit which is not possible in competitive environment or by decreasing direct expenses. In third determinant, managers can increase cash flows by decreasing assets requirements which ultimately results in increase of stock price.

Investment and financing decisions have an impact on level, timing and risk of the cash flow of firm and finally on stock price. It is necessary for manager to make decisions which can maximize the stock price of the firm.

### Maximizing Earnings Per Share is Beneficent or Not

In order to maximize stock price, many analysts focus on cash flows by evaluating the performance of the company and also focus on EPS as an accounting measure. Along with cash flow, EPS also plays an important role in identifying stockholder's value.

### Q10. What are the advantages of wealth maximization.

*Ans :*

### Advantages of Wealth Maximization

- Firstly, the wealth maximization is based on cash flows and not on profits. Unlike the profits, cash flows are exact and definite and therefore avoid any ambiguity associated with accounting profits. Profit can easily be manipulative, if there is a change in accounting assumption/policy, there is a change in profit. There is a change in method of depreciation, there is a change in profit. It is not the case in case of Cashflows.
- Secondly, profit maximization presents a shorter term view as compared to wealth maximization. Short-term profit maximization can be achieved by the managers at the cost of long-term sustainability of the business.
- Thirdly, wealth maximization considers the time value of money. It is important as we all know that a dollar today and a dollar one-year latter do not have the same value. In wealth maximization, the future cash flows are discounted at an appropriate discounted rate to represent their present value. Suppose there are two projects A and B, project A is more profitable however it is going to generate profit over a long period of time, while project B is less profitable however it is able to generate return in a shorter period. In a situation of an uncertainty, project B may be preferable. So, timing of returns is ignored by profit maximization, it is considered in wealth maximization.
- Fourthly, the wealth-maximization criterion considers the risk and uncertainty factor while considering the discounting rate. The discounting rate reflects both time and risk. Higher the uncertainty, the discounting rate is higher and vice-versa.

### Q11. How is wealth maximization a superior concept?

*Ans :* **(Mar-19, Aug./Sept.-15)**

Wealth maximization is suitable for organization as it is the only substitute for stockholder's utility. When stockholder's wealth is maximized, it leads to maximization of shareholder's utility. Hence stockholder's current wealth in a firm can be obtained by multiplying the number of shares owned with the current stock price per share.

In order to maximize wealth, current present value of any specific transaction must be maximized. In wealth maximization objective, all financial decisions must be based on cost-benefit analysis.

Wealth maximization is considered superior based on the following points,

1. It plans, for development and long-term continuity of the firm.
2. The objectives of wealth maximization constantly focuses on shareholders economic welfare.
3. Wealth maximization encourages a constant and uniform payment of dividend to the shareholders.
4. The risk and time value of money are taken into consideration by wealth maximization.

## 1.5 Profit vs. Wealth vs. Welfare

**Q12. Compare and contrast profit maximization, Wealth maximization and welfare maximization.**

*Ans :*

| | Profit Maximization | Wealth Maximization | Welfare Maximization |
|---|---|---|---|
| 1. | Profits are earned and maxi-mized, so that firm can over-come future risks which are uncertain. | that wealth of share holders can be maximized. | Welfare maximization is done with the help of micro economic techniques to examine allocative efficiency and income distribution |
| 2. | Profit maximization is a yards stick for calculating efficiency and economic prosperity of the concern. | In wealth maximization. stockholders current wealth is evaluated in order to maximize the value of shares in the market. | In welfare maximization social welfare is evaluated by calculating economic activities of individuals in the society |
| 3. | Profit is measured in terms of efficiency of the firm. | Wealth is measured in terms of market price of shares. | Welfare can be measured in two ways, either by pareto efficiency or in utils or dollars. |
| 4. | Profit maximization involves problem of uncertainty because profits are uncertain. | Wealth maximization involves problems rela-ted to maximizing shareholder's wealth or wealth of the firm. | Welfare maximization involves problem of combining the utilities of different people |

**Q13. How wealth maximization differs from profit maximization ?**

*Ans :* **(Sep.-14)**

| Basis | Wealth Maximization | Profit Maximization |
|---|---|---|
| **Definition** | It is defined as the management of financial resources aimed at increasing the value of the stakeholders of the company. | It is defined as the management of financial resources aimed at increasing the profit of the company. |
| **Focus** | Focuses on increasing the value of the stakeholders of the company in the long term. | Focuses on increasing the profit of the company in the short term. |

| | | |
|---|---|---|
| **Risk** | It considers the risks and uncertainty inherent in the business model of the company. | It does not consider the risks and uncertainty inherent in the business model of the company. |
| **Usage** | It helps in achieving a larger value of a company's worth which may reflect in the increased market share of the company. | It helps in achieving efficiency in the company's day-to-day operations to make the business profitable. |

## 1.6 The Agency Relationship and Costs

**Q14. Define :**

**(a) Agency Relationship**

**(b) Costs**

*Ans :*

**(a) Agency Relationship**

The relationship that exists between shareholders and management in an organization is known as an agency relationship. It takes place when a principal hires an agent to perform some of his duties. In agency relationship, there are chances of conflicts between the principal and the agent. This conflict is termed as agency problem.

**(b) Agency Costs**

The costs incurred by stockholders for minimizing agency problem and maximizing the owner's wealth are called as agency costs. It is the cost incurred by stockholders, so that agency problems can be reduced and shareholder's wealth can be increased. Stockholders incur these cost for maintaining a corporate governance structure. This corporate governance structure helps in observing the behaviour of management, regulating fraudulent activities of management and providing financial incentives to managers for increasing share price.



**Q15. "An agency relationship is a fiduciary relationship." Comment.**

**(OR)**

**Explain different types of agency relationships and costs.**

*Ans :* **(July-18)**

The relationship that exists in an organization between shareholders and management, is known as an agency relationship. Agency relationship results when a principal hires an agent to perform part of his duties. In this type of relationship there is chance of conflicts to occur between the principal and the agent. This conflict is termed as agency problem. The costs incurred by stockholders in order to minimize agency problem and maximize the owner's wealth are called agency costs.

The two primary agency relationship exists in a business concern are,

(i) Shareholders Vs Bondholders

(ii) Managers Vs Shareholders.

**(i) Shareholders Vs Bondholders**

Shareholders are the real owners of the concern, they pay fixed and agreed amount of interest to bondholders till the duration of bond is finished but bondholders have a preceding claim over the assets of the company. Since, equity investors are the owners of company they possess a residual claim oh the cash flows of the company. Bondholders are the only sufferers if decisions of the company are not appropriate.

When a company invest in project by taking amount from bondholders and if the project is successful, a fixed amount is paid to bondholders and rest of the profits are for shareholders, and suppose if project fails then sufferers will be the bondholders as their money have been invested.

**(ii) Managers Vs Shareholders**

Profits generated from investments in projects can be utilized for reinvestment or provided back to shareholders as dividends. If dividends are increased, it may leads to decrease in the resources which are under the manager's control and also stricts its growth. As managers are evaluated on the basis of growth they might go for unproductive projects which cannot generate appropriate returns, which make the shareholders feel shocked. This is the main cause of conflicts between managers and shareholders.

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**Q16. State the various Factors of Agency Problems.**

*Ans :*

Agency problems are the result of conflicts that exists between owners and management. In order to avoid or reduce agency problems, factors can be used. They are, market forces and agency costs.

**1. Market Forces**

Market forces can also be classified into two, they are large group of shareholders. As shareholders are the owners and possess voting right, they force management to satisfy their demands or else they liquidate their shares. Apart from shareholders, threat of takeover is also an effective market force. With the fear of takeover, management perform their duties well and in favor of interest of shareholders.

**2. Agency Costs**

It is the cost incurred by stockholders, so that agency problems can be reduced and shareholder's wealth can be increased. Stockholders incur these cost for maintaining a corporate governance structure. This corporate governance structure helps in observing the behaviour of management, regulates fraudulent activities of management and provides financial incentives to managers for increasing share price.

Structure Management Compensation Approach is famous, effective and costly approach which is related to maximization of share price. The main aim of this approach is to motivate managers to work for the interest of owners.

Compensation plans are available in two types. They are,

**(i) Incentive Plans**

In these plans, compensation of management is linked with share price. One of the commonly used incentive plan is providing stock options to management. In this plan, managers are given authority to purchase stock at market price. Managers can earn profit, if they resell these shares at a higher market price.

**(ii) Performance Plans**

In these plans, the compensation of management is calculated based on Earnings Per Share (EPS), growth in EPS and other ratios of return. Some shares of stock are provided to management for achieving performance goals known as performance shares. Cash bonuses are cash payment given to management for achieving specific performance goals.

## 1.7 Risk-Return Trade Off

**Q17. Explain the concept of Risk-Return Trade Off. State the various decisions involved in Risk-Return Trade Off.**

*Ans :* **(Nov.-20, May-19)**

The risk-return trade-off is an essential concept in finance theory. Risk implies the changes in expected returns like sales, profits, or cash flow and it also includes probability that problems related to finance will have an impact on financial position or on working capacity of the company. Risk is found in different types, they are, economic risk, political uncertainties and industry problems.

Risk analysis is a procedure of calculating and examining the risk which is related to financial and investment decisions of the company. It is necessary to evaluate risk while making capital investment decisions as it involves huge amount of capital and is for a long-term period.

Finance managers must focus on expected rate of return by comparing the level of risks involved in investment decision. When it is expected that rate of return will be high then it involves high level of risk and vice-versa. Every financial decision includes some kind of risk- return trade-off. Profitable financial and investment plan can be developed by appropriate evaluation and balancing of different risk-return trade-offs. The relationship between important financial decisions, return, risk and market value is explained in the following figure,

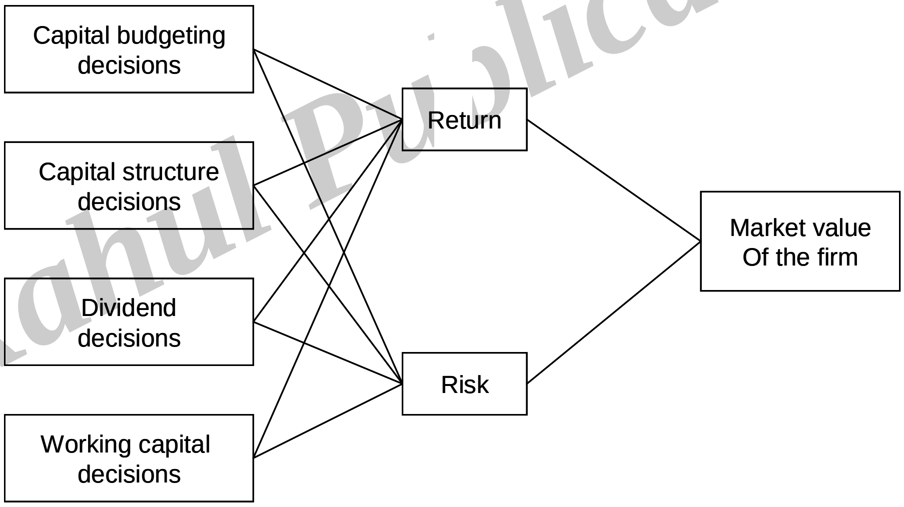


**Fig. : Decisions Risk Return and Market Value**

The decisions which involves risk-return trade off are explained below,

**1. Capital Budgeting Decisions**

Capital budgeting decision is important, as it involves proper allocation of funds. These decisions are made considerably for long period of time in order to get benefits in future. While taking capital budgeting decision, finance manager needs to evaluate the cost of capital and risk involved in it. Finance manager must have complete knowledge about the techniques used for evaluating such as Net Press & IR Value (NPV), 1RR, discounted cash flow, etc. Finance manager must have the capability of combining risk with returns in order to evaluate the potential of investment appropriately.

**2. Capital Structure Decisions**

Capital structure decisions play an important role in designing the capital structure which is suitable for the company. It is the duty of finance manager to develop an optimum capital structure which involvers amount of cost of capital, less amount of risk but which can generate huge amount of returns. While developing capital structure, finance mangers must also consider the financial and operating leverages of the firm.

**3. Dividend Decisions**

Dividend decision is also important for organization to design the dividend policy. Dividend policy involves the amount of profits to paid as dividend to shareholders or reinvested in the organization. Shareholders emphasize on getting higher amount of dividend, whereas management of company tries to maintain profits to face uncertainties in future. The dividend policy of the firm mainly depends on profitability.

**4. Working Capital Decisions**

Working capital management is an addition of fixed capital investment. Working capital management is an important element of every organization, as it helps in continuing the business processes. Decisions related to working capital are known as working capital decisions. The essential elements of working capital are cash, accounts receivable and inventory.

Each element of working capital involves some kind of risk in it. Adequate cash must be maintained in the firm to have liquidity position. Even inventory must be in adequate amount, if it is in excess then it involves risk of damage and even blockage of funds. If it is inadequate then it is difficult to meet the demands of customers. It necessary for finance manager to evaluate economic order quantity to maintain adequate level of inventory in the firm."

## 1.8 Concept of Time Value of Money

**Q18. Define Time Value of Money. State the various reasons for Time Value of Money.**

**(OR)**

**State the concept of Time Value of Money**

*Ans :* **(May-19, Aug.-17, Aug.-16)**

'Time Value of money' means that the value of a unit of money is different in different time periods. The value of a sum of money received today is more than its value received after some time. In other words, the present worth of a rupee received after some time will be less than a rupee received today. The time value of money can also be referred to as time preference for money.

**Reasons for Time Value of Money**

**1. Uncertain Future**

One can control its spending, but he has no control over his income or the inflows. A risk factor is always attached with the inflows. Everyone wants to avoid that risk and prefer cash receipts now.

**2. Inflation**

In this economic trend, the purchasing power of money is falling. Money received today is more useful than money received in future.

**3. Interest Factor Attached With Investment Opportunities**

In a simple world where a certain cash amount is received and paid at the later date, the values are different. The link is the 'Interest Rate'. People invest their savings in the hope of getting a higher value in the near future.

## 1.9 Techniques of Time Value of Money

### 1.9.1 Future Value and Present Value

**Q19. Explain the various techniques of time value of money.**

**(OR)**

**Explain the mechanism to calculate present value and future value of cash flows.**

*Ans :* **(Dec.-18, Feb.-17)**

**Techniques of Time Value of Money**

There are two techniques to incorporate time value of money.

**(a) Compounding (or) Future Value Technique**

Interest is compounded when the amount earned on an initial deposit (Principal) becomes part of the principal at the end of the first compounding period. The term principal refers to the amount of money on which interest is received. The annual compounding of interest can be calculated by using following equation

$A = P(1 + i)^n$

A = Amount at the end of the period

P = Principal at the beginning of the period

i = Rate of interest

n = Number of years.

**Example**

Suppose you have Rs. 1000 today and you deposit it with a bank which pays you 5 per cent interest compounded annually for a period of 3 years. The deposit would grow as followed

Amount at the end of the year

1 = $1,000\,(1+.05)^1$ = Rs. 1050

2 = $1050\,(1+.05)^2$ = Rs. 1,102.50

3 = $1102.50\,(1+.05)^3$ = Rs. 1157.625

The above formula can be used for wide range of i and n. However, the calculations involved will be tedious and time consuming if the number of years involved is large say 15 years or 20 years. In order to simplify the compound interest calculations, compound interest tables for values $(l+i)^n$ for wide ranges of i and n have been compiled.

Tables A - 1 gives compound value interest factor of one rupee at different rates of interest for different time periods. The compounded values can be readily calculated with the help of table A-1. Using table A-1 for the information, the compound value interest factor for Re. 1 at 5 per cent interest rate for 3 years is 1.158. Multiplying the initial principal Rs. 1000 by 1.158, we obtain Rs. 1158.

**Semi-annual compounding and other compounding periods.**

In the above example we have assumed annual compounding of interest at the end of the year. Very often the interest rates are compounded more than once a year. Savings institutions, particularly, compound interest semi-annual, quarterly and even monthly.

**(b) Present Value (or) Discounting Technique Technique**

Present value technique is also known as discounting technique. This technique is the exact opposite of compound value. In case of compounding technique money invested now appreciates in value because compound interest is added. Whereas, in case of present value approach money is received at some future date and will be worth less because the corresponding interest is lost during the period. In other words, the present value of a rupee that will be received in the future will be less than the value of rupee in hand today. It is the process of determining the present value of a future amount, assuming that the decision maker has an opportunity to earn a certain return on his money. This return is designated in financial literature as the discount rate, the cost of capital or an opportunity cost.

The process of discounting, used for calculating the present value is simply inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula,

$A = \frac{A}{(1+i)^n}$ Therefore, the present value equation becomes

P = Present value

i = Discount rate

A = Cash in flow at the year end

n = Number of years

### 1.9.2 Compounding (or) Future Value Technique

**Q20. Explain in detail Compounding (or) Future Value Technique.**

*Ans :* **(Nov.-20)**

**Compounding (or) Future Value Technique**

Interest is compounded when the amount earned on an initial deposit (Principal) becomes part of the principal at the end of the first compounding period. The term principal refers to the amount of money on which interest is received. The annual compounding of interest can be calculated by using following equation

$A = P(1 + i)^n$

A = Amount at the end of the period

P = Principal at the beginning of the period

i = Rate of interest

n = Number of years.

- **Semi-annual compounding and other compounding periods.**

  In the above example we have assumed annual compounding of interest at the end of the year. Very often the interest rates are compounded more than once a year. Savings institutions, particularly, compound interest semi-annual, quarterly and even monthly.

- **Semi-annual compounding**

  It means that there are two compounding periods within the year. Interest is actually paid after every six months at a rate on one-half of the annual (Stated) rate of interest.

**Example**

Assume Mr. X places his savings of Rs.1000 in a two year time deposit scheme of a bank which yields 6 percent interest compounded semi-annually.

In this case he will be paid 3 percent interest compounded over four periods i.e each of six months duration. The deposit would grow as follows:

| | | |
|---|---|---|
| Amount at the end of six months | = Rs. 1000 $(1+0.03)$ | = Rs 1030.00 |
| One year | = Rs. 1030 $(1+0.03)^2$ | = Rs. 1060.90 |
| Eighteen month | = Rs. 1060.90 $(1+0.03)^3$ | = Rs. 1092.73 |
| Two years | = Rs. 1092.73 $(1+0.03)^4$ | = Rs. 1125.51 |

The above calculation reveals that his savings will amount to Rs. 1060.90 and 1125.51 respectively at the end of first and second year when interest is compounded semi-annually.

- **Quarterly compounding** : It means that there are four compounding periods within a year. Instead of paying interest once a year, it is paid at the end of every quarter. Using the above example, there will be eight compounding periods at the rate of interest for each compounding period will be 1.5 percent, that 1/4 of 6 per cent.

  If the interest is paid quarterly the deposit would grow as follows.

| | | |
|---|---|---|
| Amount at the end of three months | = 1000 $(1+0.015)$ | = Rs. 1015.00 |
| Six months | = 1015 $(1+0.015)^r$ | = Rs. 1030.225 |
| Nine months | = 1030.225 $(1+0.015)^3$ | = Rs. 1045.678 |
| One year | = 1045.678 $(1+0.015)^4$ | = Rs. 1061.363 |
| Fifteen months | = 1061.363 $(1+0.015)^5$ | = Rs. 1077.283 |
| Eighteen months | = 1077.283$(1+0.015)^6$ | = Rs. 1093.442 |
| Twenty one months | = 1093.442$(1+0.015)^7$ | = Rs. 1109.843 |
| Two years | = 1109.843$(1+0.015)^8$ | = Rs. 1126.49 |

Mr. X savings will amount to Rs.. 1061.363 at the end of one year and Rs. 1126.49 at the end of two years when interest is compounded quarterly.

The effect of compounding more than once a year can also be expressed in the form of following formula :

$$P\left[1+\frac{i}{m}\right]^{mn} = A$$

Where P = Principal

i = Interest

m = Number of time compounding

n = Number of year

A = Amount at the end of period

Consider the above example and apply the above formula.

1. For Semi-annual compounding = $\text{Rs. } 1000\left(1+\frac{0.06}{2}\right)^{2\times 2}$

   Rs. 1000 ( 1 + 0.03)$^4$ = Rs. 1125.51

2. For quarterly compounding = Rs. 1000 $\left(1+\dfrac{0.06}{4}\right)^{4\times 2}$

Rs. 1000 ( 1 + 0.015)$^{8}$ = Rs. 1126.49

- **Future Value of Annuity**

A set of payments occurring for a specified number of periods is called as an annuity. Example: The premium payments made by life insurance company are considered as an annuity.

If the cash flows occurs at the end of each period then such type of annuity is called as an ordinary annuity or deferred annuity and when the cash flows occurs at the beginning of each period then such type of annuity is referred as an annuity due to the future value of an annuity. It is calculated with the help of the following formula,

$FVA_n = X(1 + r)^{n-1} + X(1 + r)^{n-2} + ... + X$

$$\boxed{\therefore\ X[(1+r)^n - 1] / r}$$

Where,

$FVA_n$ = Future value of an annuity having a duration of n periods

X = Constant periodic flow

r = Interest rate per period

n = Annuity duration.

The various compounding techniques include the following,

(a) Annual compounding

(b) Semi-annual compounding

(c) Quarterly compounding

(d) Future/compounded value of a series of payments or annual compounding of a series of payments

(e) Compound sum of an annuity or annual compounding of annuity and

(f) Doubling period.

### 1.9.3 Present Value (or) Discounting Technique Technique

**Q21. Discuss in detail Present Value (or) Discounting Technique Technique.**

*Ans :* **(March-16)**

**Present Value Technique**

Present value technique is also known as discounting technique. This technique is the exact opposite of compound value. In case of compounding technique money invested now appreciates in value because compound interest is added. Whereas, in case of present value approach money is received at some future date and will be worth less because the corresponding interest is lost during the period. In other words, the present value of a rupee that will be received in the future will be less than the value of rupee in hand today. It is the process of determining the present value of a future amount, assuming that the decision maker has an opportunity to earn a certain return on his money. This return is designated in financial literature as the discount rate, the cost of capital or an opportunity cost.

The process of discounting, used for calculating the present value is simply inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula,

$$A = \frac{A}{(1+i)^n}$$ Therefore, the present value equation becomes

P = Present value

i = Discount rate

A = Cash in flow at the year end

n = Number of years

**Present value tables**

In order to simplify the present value calculations, tables are readily available for various ranges of i and n.

Table A - 3 gives the present value factors for various discount rates and years. The total present value of future cash flows can be ascertained by multiplying it with the appropriate present value interest factor from Table A - 3 given at the end of this lesson. In terms of formula, it will be

P = A (PVIF)

Where

P = Present value

A = Amount of inflow at the end of the year

PVIF = Present value of interest factors

**Example**

Mr. Mehta wants to find the present value of Rs. 2000 to be received 5 years from now, assuring 10 per cent rate in interest.

To calculate we have to look in the 10 per cent column of the fifth year in table A-3. The relevant PVIF as per table is 0.621.

Therefore, Present value = Rs. 2000 × 0.621 = Rs. 1242

➢ **Present value of series of cash flows**

So far, we have considered only the present value of a single receipt at some future date. In many situations like capital budgeting decisions, we may be interested in the present value of a series of receipts received by the firm at different time periods. Like compounding, in order to determine the present value of such a mixed stream of cash inflows the following formula may be used.

$$P = \frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} + \frac{C_n}{(1+i)^n}$$

Where P = Present value

$C_1, C_2 - C_n$ = Annual cash flows

n = Number of year

i = Discount rate

Alternatively, using table A-3 present value is calculated as follows

$$P = C_1\,(PVIF_1) + C_2\,(PVIF2) + \_\_\_\_\_\_ + C_n\,(PVIF_n)$$

**Example**

**Calculate the present value for the following cash flows assuming a discount rate of 10 per cent**

| Year | Cash flow |
|---|---|
| 1 | Rs. 5000 |
| 2 | Rs. 10,000 |
| 3 | Rs. 15,000 |
| 4 | Rs. 20,000 |
| 5 | Rs. 25,000 |

Present values at given discount rate are to be obtained from table A-3. The calculations below show the present value for the above cash flows

| Year | Cash flows | Present value factor | Present value |
|---|---|---|---|
| 1 | Rs. 5,000 | 0.909 | Rs. 4545 |
| 2 | Rs. 10,000 | 0.826 | Rs. 8260 |
| 3 | Rs. 15,000 | 0.751 | Rs. 11265 |
| 4 | Rs. 20,000 | 0.683 | Rs. 13660 |
| 5 | Rs. 25,000 | 0.621 | Rs. 15525 |
| | | **Total** | **Rs. 53255** |

**(i) Present Value of an Annuity**

An annuity is a set of equal payments occurring at a certain time period. The present value of an annuity can be calculated as follows,

$$PVA_n = \frac{X}{1+r} + \frac{X}{1+r^2} + \ldots + \frac{X}{1+r)^{n-1}} + \frac{X}{(1+r)^n}$$

$$= X\left[\frac{1}{1+r} + \frac{1}{(1+r)^2} + \ldots + \frac{1}{(1+r)^{n-1}} + \frac{1}{(1+r)^n}\right]$$

$$\boxed{PVA_n = X\left[\left\{1-\left(\frac{1}{1+r}\right)^n\right\}\Big/ r\right]}$$

Where,

$PVA_n$ = Present value of an annuity having duration of n periods

X = Constant periodic flow

r = Discount rate.

**(ii) Present Value and Future Value Annuity Due**

Annuity due is the cash flows occurring at the beginning of each year. The cash flows of an annuity due occurs one period earlier when compared to the cash flow of an ordinary annuity. The following relationship exists between them.

Annuity due value = Ordinary annuity value X(1 + r)

It is applicable for both present value and future value. It consists of two steps in which we firstly calculate the present or future value of an ordinary annuity then it is multiplied with (1 + r).

$$\boxed{\text{Annuity due value} = \text{Ordinary annuity value X}(1 + r)}$$

**(iii) Deferred Annuity**

Deferred annuity is an annuity where cash flows occurs after few years at a later date but not at the end of the beginning year. The present value of cash flow at deferred annuity is deducted from that of the whole year. It can be calculated by using the following formula.

$$\boxed{PV = C\left[\frac{1-(1+r)^{-n}}{r}\right] \times (1+r)^{-1}}$$

Where,

C = Cash flows

r = Discount rate

n = Number of years



**PROBLEMS**

**1. A makes a deposit of Rs. 5,000 in a bank which pays 10% interest compounded annually for 6 years. You are required to find out the amount to be received after 5 years.**

*Sol :*

FV = PV $(1+r)^n$

Now, PV = Rs. 5,000, r = 10% and n = 6 years

FV = 5,000 $(1+10\%)^6$

= 5,000 x 7.716 *

= Rs. 38,580.

* From table of compounded value of an annuity.

**2. A person is required to pay four equal annual payments of Rs. 5,000 each in his deposit account that pays 8% interest per year. Find out the future value of annuity at the end of 4 years.**

*Sol :*

$$FVA = A\left(\frac{(1+r)^n - 1}{r}\right)$$

= Rs. 5,000 (4,507) = Rs. 22,535.

**3. Find out the present value of Rs. 2,000 received after in 10 years hence, if discount rate is 8%.**

*Sol :*

Present value of an the amount = $FV_n \left(\frac{1}{1+r}\right)^n$

Now, r = 8%

n = 10 years

Present value of an amount = Rs. 2,000 $\left(\frac{1}{1+0.08}\right)^{10}$

= Rs. 2,000 (0.463) = Rs. 926.

**4. A limited company borrows from a commercial bank of Rs. 10,00,000 at 12 percent rate of interest to be paid in equal annual end-of-year installments. What would the size of the installment be? Assume the repayment period is 5 years.**

*Sol :* **(Dec.-19)**

Calculation of size of installment (Annuity Amount)

P = Amount of loan = 10,00,000

Cost of capital = 12%

Repayment period = 5 years

C = Annuity amount

ADF = Annuity discounting factor @ 12%

from table A – 4 = 3,605

$$C = \frac{\text{Principal}}{\text{Annual Discount Factor}}$$

C = 10,00,000 / 3605 = ` 2,77,393

∴ Equal Installment = ` 2,77,393/-

**5. Discuss the major techniques of calculating TVM. If you want a Rs.10,00,000 for retirement in 30 years, how much would you have to save by the end of each year if you could make 12% per year ? How much would you have to set aside each year if you could put money away starting now ?**

*Sol :* **(July-18)**

Amount wanted for retirement = Rs. 10,00,000

Time duration = 30 yrs

Rate of interest = 12% p.a

$$FVA_n = \frac{x\left[(1+r)^n - 1\right]}{r}$$

$$10,00,000 = \frac{x\left[1+0.12)^{30} - 1\right]}{0.12}$$

$$10,00,000 = \frac{x\left[(1.12)^{30} - 1\right]}{0.12}$$

$$10,00,000 = \frac{x[28.96]}{0.12}$$

$$1,12,000 = x[28.96]$$

$$\therefore \quad x = \frac{1,20,000}{28.96} = 4,144$$

**6. You have invested ` 2,000 at the end of first year, ` 3,000 at the end of second year and ` 5,000 each year from third to fifth years. Find the present value of these cash flows at a discount rate of 10%.**

*Sol :* **(Sep.-16)**

**Calculation of Present Value of Cash Flows**

| End of Year<br>1 | Future Value<br>2 | ROI (0)<br>3 | P.V. Factor<br>$\left[\frac{1}{(1+r)^n}\right]$ 4 | Present Value<br>5 = 2 × 4 |
|---|---|---|---|---|
| 1 | 2,000 | 0.10 | 0.9091 | 1818.2 |
| 2 | 3,000 | 0.10 | 0.8264 | 2479.2 |
| 3 | 5,000 | 0.10 | 0.7513 | 3756.5 |
| 4 | 5,000 | 0.10 | 0.6830 | 3415.0 |
| 5 | 5,000 | 0.10 | 0.6830 | 3104.5 |
| | 20,000 | | | 14,573.4 |

**7. Find the present value of ` 1,00,000 receivable after 8 years if the rate of discount is,**

**(i) 10% and (ii) 5%**

*Sol :* **(March-16)**

P. V after 8 years of ` 1,00,000 = ?

Given that,

Discount rates

(i) 10%

(ii) 5%

$$\boxed{V_0 = \frac{V_n}{(1+I)^n}} \quad \text{or} \quad PV = F\left[\frac{1}{(1+i)^n}\right]$$

**(i) At 10% Discount Rate**

$V_n = 1{,}00{,}000$

$I = 0.10$

n = Number of years i.e., 8 years

$$V_n = \frac{1{,}00{,}000}{(1+0.10)^8} = \frac{1{,}00{,}000}{(1.10)^8}$$

$$= \frac{1{,}00{,}000}{2.1435}$$

$$= 46652.67$$

$\therefore$ Present value of ` 1,00,000 receivable after 8 years @ 10% discount rate is 46652.67

**(ii) At 5% Discount Rate**

$V = 1{,}00{,}000$

$I = 0.05$

n = 8 years

$$V_n = \frac{1{,}00{,}000}{(1+0.05)^8} = \frac{1{,}00{,}000}{(1.05)^8}$$

$$= \frac{1{,}00{,}000}{1.47745} = 67684.18$$

$\therefore$ Present value of ` 1,00,000 receivable after 8 years @ 5% discount rate is 67684.18.

## 1.10 The Basic Valuation Model

**Q22. Define value. What are the different types of basic valuation models?**

*Ans :*

The term 'value' has a different meaning depending on its applications. The various concepts of value are,

**1. Book Value**

The financial statements are based on accounting costs and conventions of the firms. Example: Balance Sheet is used for computing the book value of assets.

**2. Market Value**

The value at which an asset or security can be sold in the present market conditions is known as "market value of an asset or a security".

**3. Going Concern Value**

In the process of valuation, the going concern value is an important determinant in the evaluation of the value of shares.

**4. Liquidation Value**

If an organization has decided to wind-up its operations, then it will sell-off its assets, the value at which the assets are sold in case of termination of a business is said to be “the liquidation value”.

**5. Replacement Value**

In balance sheet, the value of assets are calculated based on their historical costs, which may be inappropriate in the present situation. So, this problem can be overcomed by computing and recording the value of assets on the basis of replacement cost.

**Basic Valuation Models**

The value of an equity share is obtained by considering the expected cash inflows and the risk associated with them. Investors receive annual dividends, if the firm is able to make profitable investments. Similarly, they can earn capital gains by selling the shares in the capital markets. The value of an equity share is referred to as the “present value of its future dividends”. It can be explained with the help of the valuation models such as,

**1. One-period Valuation Model**

If an investor invest in the equity shares for an year then he/she realizes his/her rights of sales. Under such circumstances, the value of the shareholdings of investor would be the combination of the annual dividends and the market price at the end of an year. It is represented as,

$$\boxed{P_0 = \frac{D_1}{1+k_e} + \frac{P_1}{1+k_e}}$$

Where,

$P_0$ = Current market price of a share

$D_1$ = Expected rate of dividend at the end of first year

$P_1$ = Expected price of share at the end of first year

$K_e$ = The required rate of return on equity.

**2. Two-period Valuation Model**

Two period valuation model is an extension of a single-period valuation model, wherein the investor decides to hold the share for a period of two years and then exercises his/her right to sell. It is represented as,

$$\boxed{P_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \frac{D_2}{(1+k_e)^2}}$$

Where,

$D_1$ and $D_2$ = Expected dividend at the end of first and second year

$P_2$ = Expected selling price at the end of second year.

**3. n-period Valuation Model**

If an investor decides to purchase and hold the share for V years and exercises his/her right to sell, then the value of the share will be,

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n}$$

or

$$P_0 = \sum_{i=1}^{n} \frac{D_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n}$$

If dividends are paid at constant rate then the value of the share can be calculated by using the annuity discount factor,

$P_0$ = Dividend value × (Annuity factor) (i, n) + (D Fi, n).

## 1.11 Risk and Return

**Q23. What is Risk ?**

*Ans :*

Risk is uncertainty that a future event with a favourable outcome will occur. In other words, risk is the probability that an investment will not perform as expected and the investor will lose the money invested in the project. All business decisions and opportunities are based on this concept that future performance and returns are uncertain and rely on many uncontrollable variables.

Risk is inherent in any investment. Risk may relate to loss of capital, delay in repayment of capital, non-payment of return or variability of returns. The risk of an investment is determined by the investments, maturity period, repayment capacity, nature of return commitment and so on.

Risk implies future uncertainty about deviation from expected earnings or expected outcome. Risk measures the uncertainty that an investor is willing to take to realize a gain from an investment.

Total Risk

= General Risk + Specific Risk

= Market Risk + Issuer Risk

= Systematic Risk + Non Systematic Risk

**Q24. What are the causes of Risk ?**

*Ans :*

**Causes of Risk**

There are a number of factors which cause risk in the investments. Various factors influencing risk are business failure, market fluctuations, change in the interest rate inflation in the economy, fluctuations in exchange rates changes in the political situation etc.

- Wrong method of investment
- Wrong timing of investment
- Wrong quantity of investment

- Interest rate risk
- Nature of investment instruments
- Nature of industry in which the company is operating
- Creditworthiness of the issuer
- Maturity period or length of investment
- Terms of lending
- National and International factors
- Natural calamities etc.

**Q25. Differences between unique risk and market risk.**

*Ans :* **(Sep.-15)**

| S.No. | Unique Risk | S.No. | Market Risk |
|---|---|---|---|
| 1. | Unique risk is that risk, in which the changes in the market conditions does not influence the returns of securities. | 1. | Market risk is that risk, where the changes in total returns from the securities is directly influenced by the changes in the general market or an economy as a whole. |
| 2. | Unique risk is also called as unsystematic risk or diversifiable risk. | 2. | Market risk is also called as systematic risk (as it affects all securities) or non-diversifiable risk. |



**Q26. Discuss briefly about Return.**

*Ans :*

Return is one of the most important motivating factor which encourages investment. Return is the premium given to the investor for making investment. In order to evaluate the performance of investment manager, it is very essential to calculate the historical returns. These returns are also commonly used as a key input for forecasting the returns in future.

The return of an investment includes two elements which are as follows,

**(i) Current Return**

The first element of return is periodic cash flow (income) like dividend or interest which are produced from the investment. Current return is assessed as the regular periodic income in connection with the initial price of the investment.

**(ii) Capital Return**

Capital return is the second element of return which is exhibited in the price fluctuations. Capital return is referred as appreciation or depreciation in price which is divided by the initial price of the asset. Capital return dominates the assets such ap equity stocks etc.

Hence, the total return for any security' is given as,

$$\boxed{\text{Total return} = \text{Current return} + \text{Capital return}}$$

The value of current return can be zero or positive whereas the value of capital return can be negative, zero or positive.

**8. In December 2015, ZTECH stock had a beta of 0.95. The Treasury rate at the time was 5%, and the treasury bond rate was 6%. The firm had debt outstanding of Rs.1.7 crore and a market value of equity of Rs.1.5 crore; the corporate marginal tax rate was 40%.**

**(a) Estimate the expected return on the stock for a short term investor in the company.**

**(b) Estimate the expected return on the stock for a long term investor in the company**

**(c) Estimate the cost of equity**

*Ans :* **(July-18)**

Given,

Beta = 0.95

Treasury bill rate = 5%

Treasury bond rate = 6%

Assume historical risk-premium over T-bills = 8.5%

Assume historical risk-Premium over T-bonds = 5.5%

(a) Expected return on stock for short term investor = T-bill rate + (Beta × Risk Premium over T-bills)

= 5% + (0.95 × 8.5%)

= 5% + 8.075%

= 13.075%

(b) Expected return on stock for long term investor = T-bond rate + (Beta × Risk Premium over T-bonds)

= 6% + (0.95 × 5.5%)

= 6% + 5.225%

= 11.225%

(c) Cost of equity = Weight of equity in capital × Expected return for long term investor

Market value of equity = ` 1.5 crore

Debt outstanding = (` 1.5 crore + ` 1.7 crore)

= ` 3.2 crore

Weight of equity in capital = $\frac{\text{` 1.5 crore}}{\text{` 3.2 crore}}$

= 0.46875

Expected return for long term investor = 11.225%

∴ Cost of equity for the company = 0.46875 × 11.225%

= 5.2617 or 5.26%

# Exercise Problems

1. If a man deposit ` 55,650 in a bank which is paying a 12 per cent rate of interest on a ten-year time deposit, haw much would the deposit grow at the end of ten years?

   **[Ans: ` 1,72,848.90]**

2. Find the amount of annuity if payment of ` 500 is made annually for 7 years at interest rate of 14% compounded annually.

   **[Ans: ` 5,365.251]**

3. Find the present value of ` 10,000 to be required after 5 years if the interest rate be 9 per cent.

   **[Ans: ` 6,500]**

4. What is the present value of ` 2,000 receivable annually for 30 years? The first receipt occurs after 10 years and the discount rate is 10% p.a.

   **[Ans: ` 6,564.7]**

5. A sinking fund consists of 15 annual deposits of ` 1000 each, with interest earned at the rate of 4% compounded annually. What is the principal in the fund at its terminal date?

   **[Ans: ` 20.023.6]**

6. Mr. Longman borrow ` 10,00,000 at an interest rate of 15% and the loan is to be paid in 5 equal installments payable at the end of each of the next 5 years. Prepare the loan-amortisation schedule.

   **[Ans: ` 2,98,312]**

# Short Question and Answers

**1. Define the term finance function.**

*Ans :*

Finance function is a primary function among all other business functions because every firm requires finance in order to develop and expand its business. Finance can be raised from different sources i.e., short-term or long-term and internal or external sources. The finance function of a firm must be effectively managed in order to ensure proper utilization of funds and repayment of funds on time.

**Nature**

Finance is an important field of business management. It is a term which is refered as administration of flow of money in organization. Finance or financial management is an area which is very useful for managing the business smoothly. Finance is different from accounting but it uses information of accounting for making effective decisions. Accounting deals with recording, reporting and evaluating the business transactions whereas finance is termed as managerial or decision making process.

Economics deals with evaluating the allocation of resources in economy and also related to cost and profits, demand and supply and production and consumption. Economics also consider those transactions which involves goods and services either in return of cash or not.

Economics is easy to understand when divided into two parts,

**(i) Microeconomics**

It is also known as price theory of the firm. Microeconomics explains the behaviour of rational persons in making decisions related to pricing and production.

**(ii) Macroeconomics**

Macroeconomics is a broad concept as it takes into consideration the overall economic situation of a nation. It uses Gross National Product (GNP) and useful in forecasting.

**2. Define financial management.**

*Ans :*

**Meaning of Financial Management**

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

**Definitions of Financial Management**

(i) **According to Solomon,** "Financial management is concerned with the efficient use of an important economic resource, namely, capital funds."

(ii) **According to J. L. Massie,** "Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operation."

(iii) **According to Weston,** "Financial management is an area of financial decision making harmonising individual motives and enterprise goals".

(iv) **According to JF Bradley,** "The area of the business management devoted to a judicious use of capital and careful selection of source of capital in order to enables a spending unit to move in the direction of reaching its goals".

**3. Functions of financial manager**

*Ans :*

**(i) Financial Forecasting and Planning**

Financial planning and estimating funds in future is an important function of a financial manager. The financial manager must determine the financial requirements of the firm which are required for acquiring fixed assets and for maintaining adequate working capital.

**(ii) Acquisition of Funds**

Financial manager needs to acquire funds after making appropriate financial plans. Funds can be acquired from different sources such as shares, debentures, banks, financial institutions etc. Financial manager needs to select an appropriate source, so that it does not create any problems in future. He must evaluate benefits and drawbacks of available sources before making a final decision.

**(iii) Investment of Funds**

Funds acquired must be used in a profitable manner. The cost incurred in acquiring funds must be compared with the returns they yield. For this purpose the capital budgeting technique is very useful. The goal of an organization is to maximize profits which can be attained only when funds are properly utilized and are not left idle. It is necessary for a financial manager to consider the principles of safety, liquidity and soundness at the time of investing funds.

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**4. Goals of finance function.**

*Ans :*

Financial management is concerned with procurement and use of funds. Its main aim is to use business funds in such a way that the firm's value earnings are maximised. There are various alternatives available for using business funds. Each alternative course has to be evaluated in detail. The pros and cons of various decisions have to looked into before making a final selection. The decisions will have to take into consideration the commercial strategy of the business. Financial management provides a framework for selecting a proper course of action and deciding a viable commercial strategy. The main objective of a business is to maximise the owner's economic welfare. This objective can be achieved by :

1. Profit Maximization
2. Wealth Maximization

**1. Profit Maximization**

Profit earning is the main aim of every economic activity. A business being an economic institution must earn profit to cover its costs and provide funds for growth. No business can survive without earning profit. Profit is a measure of efficiency of a business enterprise. Profits also serve as a protection against risks which cannot be ensured. The accumulated profits enable a business to face risks like fall in prices, competition from other units, adverse government policies etc. Thus, profit maximization is considered as the main objective of business.

**2. Wealth Maximization**

Welath maximization is the appropriate objective of an enterprise. financial theory asserts that wealth maximization is the single substitute for a stockholder's utility. When the firm miximizes the stockholder's wealth, the individual stock holder can use this wealth to maximise his individual utility

A stockholder's current wealth in the firm is the product of the number of shares owned, multiplied with the current stock price per share

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**5. Agency Relationship**

*Ans :*

The relationship that exists between shareholders and management in an organization is known as an agency relationship. It takes place when a principal hires an agent to perform some of his duties. In agency relationship, there are chances of conflicts between the principal and the agent. This conflict is termed as agency problem.

**6. "An agency relationship is a fiduciary relationship." Comment.**

*Ans :*

The relationship that exists in an organization between shareholders and management, is known as an agency relationship. Agency relationship results when a principal hires an agent to perform part of his duties. In this type of relationship there is chance of conflicts to occur between the principal and the agent. This conflict is termed as agency problem. The costs incurred by stockholders in order to minimize agency problem and maximize the owner's wealth are called agency costs.

The two primary agency relationship exists in a business concern are,

(i) Shareholders Vs Bondholders

(ii) Managers Vs Shareholders.

**(i) Shareholders Vs Bondholders**

Shareholders are the real owners of the concern, they pay fixed and agreed amount of interest to bondholders till the duration of bond is finished but bondholders have a preceding claim over the assets of the company. Since, equity investors are the owners of company they possess a residual claim oh the cash flows of the company. Bondholders are the only sufferers if decisions of the company are not appropriate.

When a company invest in project by taking amount from bondholders and if the project is successful, a fixed amount is paid to bondholders and rest of the profits are for shareholders, and suppose if project fails then sufferers will be the bondholders as their money have been invested.

**(ii) Managers Vs Shareholders**

Profits generated from investments in projects can be utilized for reinvestment or provided back to shareholders as dividends. If dividends are increased, it may leads to decrease in the resources which are under the manager's control and also stricts its growth. As managers are evaluated on the basis of growth they might go for unproductive projects which cannot generate appropriate returns, which make the shareholders feel shocked. This is the main cause of conflicts between managers and shareholders.

**7. Risk-Return Trade Off**

*Ans :*

The risk-return trade-off is an essential concept in finance theory. Risk implies the changes in expected returns like sales, profits, or cash flow and it also includes probability that problems related to finance will have an impact on financial position or on working capacity of the company. Risk is found in different types, they are, economic risk, political uncertainties and industry problems.

Risk analysis is a procedure of calculating and examining the risk which is related to financial and investment decisions of the company. It is necessary to evaluate risk while making capital investment decisions as it involves huge amount of capital and is for a long-term period.

Finance managers must focus on expected rate of return by comparing the level of risks involved in investment decision. When it is expected that rate of return will be high then it involves high level of risk and vice-versa. Every financial decision includes some kind of risk- return trade-off. Profitable financial and investment plan can be developed by appropriate evaluation and balancing of different risk-return trade-offs. The relationship between important financial decisions, return, risk and market value is explained in the following figure,

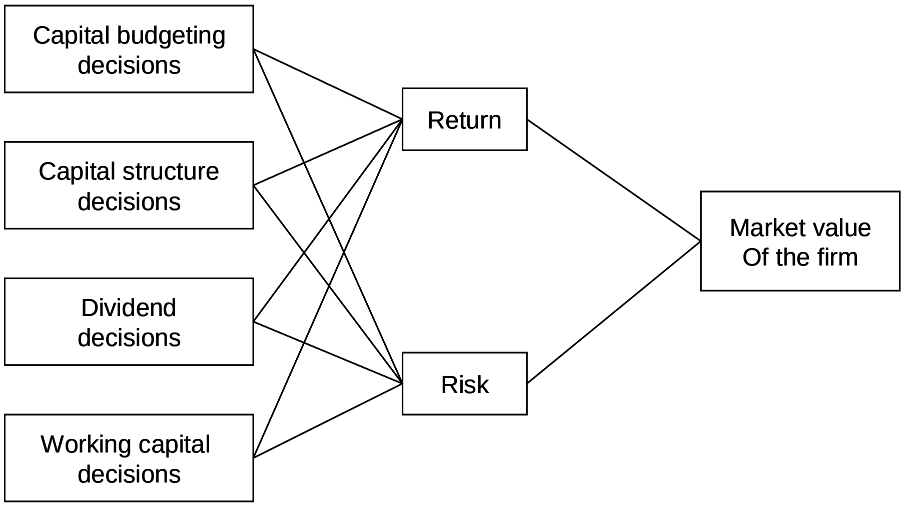


**Fig. : Decisions Risk Return and Market Value**

The decisions which involves risk-return trade off are explained below,

**1. Capital Budgeting Decisions**

Capital budgeting decision is important, as it involves proper allocation of funds. These decisions are made considerably for long period of time in order to get benefits in future. While taking capital budgeting decision, finance manager needs to evaluate the cost of capital and risk involved in it. Finance manager must have complete knowledge about the techniques used for evaluating such as Net Press & IR Value (NPV), 1RR, discounted cash flow, etc. Finance manager must have the capability of combining risk with returns in order to evaluate the potential of investment appropriately.

**2. Capital Structure Decisions**

Capital structure decisions play an important role in designing the capital structure which is suitable for the company. It is the duty of finance manager to develop an optimum capital structure which involvers amount of cost of capital, less amount of risk but which can generate huge amount of returns. While developing capital structure, finance mangers must also consider the financial and operating leverages of the firm.

**3. Dividend Decisions**

Dividend decision is also important for organization to design the dividend policy. Dividend policy involves the amount of profits to paid as dividend to shareholders or reinvested in the organization. Shareholders emphasize on getting higher amount of dividend, whereas management of company tries to maintain profits to face uncertainties in future. The dividend policy of the firm mainly depends on profitability.

**8. Time Value of Money**

*Ans :*

'Time Value of money' means that the value of a unit of money is different in different time periods. The value of a sum of money received today is more than its value received after some time. In other words, the present worth of a rupee received after some time will be less than a rupee received today. The time value of money can also be referred to as time preference for money.

**Reasons for Time Value of Money**

**1. Uncertain Future**

One can control its spending, but he has no control over his income or the inflows. A risk factor is always attached with the inflows. Everyone wants to avoid that risk and prefer cash receipts now.

**2. Inflation**

In this economic trend, the purchasing power of money is falling. Money received today is more useful than money received in future.

**3. Interest Factor Attached With Investment Opportunities**

In a simple world where a certain cash amount is received and paid at the later date, the values are different. The link is the 'Interest Rate'. People invest their savings in the hope of getting a higher value in the near future.

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**9. What are the different types of basic valuation models?**

*Ans :*

The value of an equity share is obtained by considering the expected cash inflows and the risk associated with them. Investors receive annual dividends, if the firm is able to make profitable investments. Similarly, they can earn capital gains by selling the shares in the capital markets. The value of an equity share is referred to as the "present value of its future dividends". It can be explained with the help of the valuation models such as,

**1. One-period Valuation Model**

If an investor invest in the equity shares for an year then he/she realizes his/her rights of sales. Under such circumstances, the value of the shareholdings of investor would be the combination of the annual dividends and the market price at the end of an year. It is represented as,

$$\boxed{P_0 = \frac{D_1}{1+k_e} + \frac{P_1}{1+k_e}}$$

Where,

$P_0$ = Current market price of a share

$D_1$ = Expected rate of dividend at the end of first year

$P_1$ = Expected price of share at the end of first year

$K_e$ = The required rate of return on equity.

**2. Two-period Valuation Model**

Two period valuation model is an extension of a single-period valuation model, wherein the investor decides to hold the share for a period of two years and then exercises his/her right to sell. It is represented as,

$$\boxed{P_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \frac{D_2}{(1+k_e)^2}}$$

Where,

$D_1$ and $D_2$ = Expected dividend at the end of first and second year

$P_2$ = Expected selling price at the end of second year.

**3. n-period Valuation Model**

If an investor decides to purchase and hold the share for V years and exercises his/her right to sell, then the value of the share will be,

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n}$$

or

$$P_0 = \sum_{i=1}^{n} \frac{D_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n}$$

If dividends are paid at constant rate then the value of the share can be calculated by using the annuity discount factor,

$P_0$ = Dividend value × (Annuity factor) (i, n) + (D Fi, n).

**10. Causes of Risk**

*Ans :*

There are a number of factors which cause risk in the investments. Various factors influencing risk are business failure, market fluctuations, change in the interest rate inflation in the economy, fluctuations in exchange rates changes in the political situation etc.

- Wrong method of investment
- Wrong timing of investment
- Wrong quantity of investment
- Interest rate risk
- Nature of investment instruments
- Nature of industry in which the company is operating
- Creditworthiness of the issuer
- Maturity period or length of investment
- Terms of lending
- National and International factors
- Natural calamities etc.

**11. Discuss briefly about Return.**

*Ans :*

Return is one of the most important motivating factor which encourages investment. Return is the premium given to the investor for making investment. In order to evaluate the performance of investment manager, it is very essential to calculate the historical returns. These returns are also commonly used as a key input for forecasting the returns in future.

The return of an investment includes two elements which are as follows,

**(i) Current Return**

The first element of return is periodic cash flow (income) like dividend or interest which are produced from the investment. Current return is assessed as the regular periodic income in connection with the initial price of the investment.

**(ii) Capital Return**

Capital return is the second element of return which is exhibited in the price fluctuations. Capital return is referred as appreciation or depreciation in price which is divided by the initial price of the asset. Capital return dominates the assets such ap equity stocks etc.

Hence, the total return for any security' is given as,

Total return = Current return + Capital return

The value of current return can be zero or positive whereas the value of capital return can be negative, zero or positive.

**12. Explain about sensitivity analysis.**

*Ans :*

Where cash inflows are very sensitive under different circumstances, more than one forecast of the future cash inflows may be made. These inflows are regarded as "Optimistic", "Most Likely" and "Pessimistic." Cash inflows may be discounted to find out the net present values under these 3 different situations. If the net present values under the three situations differ widely it implies that there is a great risk in the project and the investor's decision to accept or reject a project will depend upon his risk bearing abilities.

| UNIT II | The Investment Decision: Investment decision process- Project generation, project evaluation, project selection and project Implementation. Developing Cash Flow; Data for New Projects; Capital Budgeting Techniques–Traditional and DCF methods. The NPV vs. IRR Debate; Approaches for reconciliation. Capital budgeting decision under conditions of risk and uncertainty. Cost Of Capital: Concept and measurement of cost of capital, Debt vs. Equity, cost of equity, preference shares, equity capital and retained earnings, weighted average cost of capital and marginal cost of capital. Importance of cost of capital in capital budgeting decisions. |
|---|---|

## 2.1 The Investment Decision / Capital Budgeting

**Q1. What do you understand by Capital Budgeting?**

*Ans :* **(Feb.-17, Sep.-16)**

**Meaning of Capital Budgeting**

Capital budgeting is the process of making investment decisions in capital expenditures. A capital expenditure may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in future. In simple language we may say that a capital expenditure is an expenditure incurred for acquiring or improving the fixed assets, the benefits of which are expected to be received over a number of years in future. The following are some of the Examples of capital expenditure :

1. Cost of acquisition of permanent assets as land and building, plant and machinery, goodwill, etc.
2. Cost of addition, expansion, improvement or alteration in the fixed assets.
3. Cost of replacement of permanent assets.
4. Research and development project cost, etc.

Capital expenditure involves non-flexible long-term commitment of funds. Thus, capital expenditure decisions are also called as long term investment decisions. Capital budgeting involves the planning and control of capital expenditure. It is the process of deciding whether or not to commit resources to a particular long term project whose benefits are to be realized over a period of time, longer than one year. Capital budgeting is also known as Investment Decision Making, Capital Expenditure Decisions, Planning Capital Expenditure and Analysis of Capital Expenditure.

**Definitions**

i) **According to Charles T. Horngreen** has defined capital budgeting as, "Capital budgeting is long term planning for making and financing proposed capital outlays."

ii) **According to G.C. Philippatos**, "Capital budgeting is concerned with the allocation of the firm's scarce financial resources among the available market opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent streams of expenditures for it".

iii) **According to Richard** and **Greenlaw** have referred to capital budgeting as acquiring inputs with long-run return.". In the words of Lynch, "Capital budgeting consists in planning development of available capital for the purpose of maximizing the long term profitability of the concern."

From the above description, it may be concluded that the important features which distinguish capital budgeting decision from the ordinary day to day business decisions are :

1. Capital budgeting decisions involve the exchange of current funds for the benefits to be achieved in future ;
2. The future benefits are expected to be realized over a series of years;
3. The funds are invested in non-flexible and long term activities;
4. They have a long term and significant effect on the profitability of the concern;
5. They involve, generally, huge funds;
6. They are irreversible decisions.
7. They are 'strategic' investment decisions, involving large sums of money, major departure from the past practices of the firm, significant change of the firm's expected earnings associated with high degree of risk, as compared to 'tactical' investment decisions which involve a relatively small amount of funds that do not result in a major departure from the past practices of the firm.

**Q2. Explain the Importance of Capital Budgeting.**

**(OR)**

**What is the significant of capital budgeting to a firm.**

*Ans :* **(Sep.-15)**

Capital budgeting means planning for capital assets. Capital budgeting decisions are vital to any organisation as they include the decisions as to :

a) Whether or not funds should be invested in long term projects such as setting of an industry, purchase of plant and machinery etc.
b) Analyse the proposal for expansion or creating additional capacities.
c) To decide the replacement of permanent assets such as building and equipments.
d) To make financial analysis of various proposals regarding capital investments so as to choose the best out of many alternative proposals.

The importance of capital budgeting can be well understood from the fact that an unsound investment decision may prove to be fatal to the very existence of the concern. The need, significance or importance of capital budgeting arises mainly due to the following :

**1. Large Investments**

Capital budgeting decisions, generally, involve large investment of funds. But the funds available with the firm are always limited and the demand for funds far exceeds the resources. Hence, it is very important for a firm to plan and control its capital expenditure.

**2. Long-term Commitment of Funds**

Capital expenditure involves not only large amount of funds but also funds for long-term or more or less on permanent basis. The long-term commitment of funds increases the financial risk involved in the investment decision. Grater the risk involved, greater is the need for careful planning of capital expenditure, i.e. Capital budgeting.

**3. Irreversible Nature**

The capital expenditure decisions are of irreversible nature. Once the decision for acquiring a permanent asset is taken, it becomes very difficult to dispose of these assets without incurring heavy losses.

**4. Long-term Effect on Profitability**

Capital budgeting decisions have a long-term and significant effect on the profitability of a concern. Not only the present earnings of the firm are affected by the investments in capital assets but also the future growth and profitability of the firm depends upon the investment decision taken today. An unwise decision may prove disastrous and fatal to the very existence of the concern. Capital budgeting is of utmost importance to avoid over investment or under investment in fixed assets.

**5. Difficulties of Investment Decisions**

The long term investment decisions are difficult to be taken because (i) decision extends to a series of years beyond the current accounting period, (ii) uncertainties of future and (iii) higher degree of risk.

**6. National Importance**

Investment decision though taken by individual concern is of national importance because it determines employment, economic activities and economic growth.

Thus, we may say that without using capital budgeting techniques a firm may involve itself in a losing project. Proper timing of purchase, replacement, expansion and alternation of assets is essential."

**Q3. Explain the Features of Capital Budgeting.**

*Ans :*

The capital budgeting decisions are often said to be the most important part of corporate financial management. Any decision that requires the use of resources is a capital budgeting decision; thus the capital budgeting decisions cover everything from broad strategic decisions at one extreme to say computerization of the office, at the other. The capital budgeting decisions affect the profitability of a firm for a long period, therefore the importance of these decisions is obvious. Even a single wrong decision by a firm may endanger the existence of the firm as a profitable firm.

A decision to diversify into a new product line if not taken correctly, may convert a profitable firm into a loss making firm. There are several factors and considerations which make the capital budgeting decisions as the most important decisions of a finance manager. The relevance and significance of capital budgeting may be stated as follows :

**a) Long Term Effects**

Perhaps, the most important features of a capital budgeting decision and which makes the capital budgeting so significant is that these decisions have long term effects on the risk and return composition of the firm. These decision affect the future position of the firm to a considerable extent as the capital budgeting decisions have long term implications and consequences. By taking a capital budgeting decision, a finance manager in fact makes a commitment into the future, both by committing to the future needs of funds of the projects and by committing to its future implications.

**b) Substantial Commitments**

The capital budgeting decisions generally involve large commitment of funds and as a result substantial portion of capital funds are blocked in the capital budgeting decisions. In relative terms therefore, more attention is required for capital budgeting decisions, otherwise the firm may suffer from the heavy capital losses in time to come. It is also possible that the return from a projects may not be sufficient enough to justify the capital budgeting decision.

**c) Irreversible Decisions**

Most of the capital budgeting decisions are irreversible decisions. Once taken, the firm may not be in a position to revert back unless it is ready to absorb heavy losses which may result due to abandoning a project in midway. Therefore, the capital budgeting decisions should be taken only after considering and evaluating each and every minute detail of the project, otherwise the financial consequences may be far reaching.

**d) Affect the Capacity and Strength to Compete**

The capital budgeting decisions affect the capacity and strength of a firm to face the competition. A firm may loose competitiveness if the decision to modernize is delayed or not rightly taken. Similarly, a timely decision to take over a minor competitor may ultimately result even in the monopolistic position of the firm.

Thus, the capital budgeting decisions involve a largely irreversible commitment of resources i.e., subject to a significant degree of risk. These decisions may have far reaching effects on the profitability of the firm. These decisions therefore, require a carefully developed decision making process and strategy based on a reliable forecasting system.

### 2.1.1 Investment decision process

#### 2.1.1.1 Project generation, project evaluation, project selection and project Implementation.

**Q4. Outline the process of investment decisions.**

**(OR)**

**Explain the various steps involved in capital budgeting decisions.**

*Ans :*

The following figure depicts the steps involved in investment decision process,

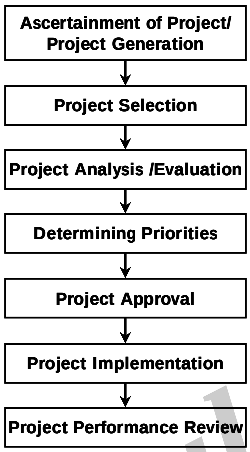


**Fig.: Process of Investment Decision**

**(i) Ascertainment of Project/Project Generation**

Identifying the project for investment is the first step in capital budgeting. From various projects, the project needs to be ascertained by department officer or head for analysis and the suitable project is selected according to corporate strategies and submitted to the capital expenditure planning committee for large organization or else to concerned head for long-term investment decisions.

**(ii) Project Selection**

Different projects are checked thoroughly by capital expenditure planning committee and selection is based on the corporate strategy.

**(iii) Project Analysis/Evaluation**

In this step, profitability of different projects are analysed. It may be classified into independent project, dependent project and mutually exclusive project. The methods by which profitability of project can be ascertained are Pay Back Period (PBP), Rate of Return (ROR), Net Present Value (NPV), Internal Rate of Return (IRR) etc.

**(iv) Determining Priorities**

Giving priorities helps the firm or an individual to work smoothly. By analysing the project, one can know the profitability, urgency and risk involved and can accordingly select the project. Ranking different projects is required for the firm.

**(v) Project Approval**

After meeting all the requirements stated in the above step the project is approved and included in capital expenditure budget. Then, the amount from which fixed assets are purchased in budget period is estimated.

**(vi) Project Implementation**

Implementing the project is an important aspect for capital expenditure committee as they have to consider the profitability of the project with time and cost limit. To overcome delays in work network techniques such as PERT and CPM are useful for managing the project.

**(vii) Project Performance Review**

The final step is to check whether all the above steps are running smoothly or not and if any problem occurred, it can be rectified with corrective actions. The project expenditure needs to be compared with post completion expense of the investment process, the actual return generating from investment, everything needs to be properly viewed. Finally, the performance can be known.

## 2.2 Developing Cash Flow - Data for New Projects

**Q5. Explain the different techniques of Developing Cash Flow.**

**(OR)**

**State the three components of cash flow that may exist for a given project proposal.**

*Ans :*

Generally, a typical investment proposal will have three components of cash flows:

a) **Initial Investment :** Initial investment is the net cash out lay required to purchase an asset. A major element of the initial investment is the cost of an asset freight and installation charges. When an asset is purchased for expanding revenues, it may require some additional working capital also. Thus, initial investment will be equal to total of gross investment plus net working capital Further, in case of replacement decisions, sale value of existing assets should be subtracted to arrive at the initial investment.

b) **Annual Net Cash Inflows :** An investment proposal is expected to generate annual cash flows from operations after the initial cash out lay has been made. Cash flows should be estimated on an after tax basis.

Computation of after tax cash flows requires a careful treatment of non cash expense items such as depreciation. Depreciation is an allocation of cost of an asset. It involves an accounting entry and does not require any cash outflow. Depreciation is however, a, deductible expense for computing taxes. In the process of calculation of cash flows depreciation does not have any direct impact but indirectly influence cash flows since it reduces the firms tax liability. The savings resulting from depreciation is called depreciation tax shield. Since the depreciation is a non cash item it should be added back to the net profit after taxes to get the net cash flows.

c) **Terminal Cash Flows :** The above equation provides a general definition of net cash flows in any particular year. However, the last or terminal year of an investment may have additional cash flows. Salvage value and release of net working capital are the example of terminal cash flows. In the process of calculating net cash flows, salvage value and release of net working capital should be added to the last year cash flow. In case of replacement of an asset, salvage value of old asset will reduce the initial outlay of the new asset.

**Q6. State the computation of cash flows.**

*Ans :*

**Calculation of Cash Flow After Tax (CAFT)**

**Proforma**

| Particulars | Amt |
|---|---|
| Revenue / income | xxx |
| (–) Expenses | xx |
| CFBD&T / CFBT | xxx |
| (–) Dep | xx |
| Profit before tax (PBT) | xxx |
| (–) Tax | xx |
| Profit After Tax (PAT) | xxx |
| (+) Dep | xx |
| Cash Flow After Tax (CAFT) | xxx |

$$\text{Dep.} = \frac{\text{Cost of Asset (+) Instillation charges (–) Scrap Value}}{\text{Estimated life of the asset}}$$

## Problems on Calculation of Cashflows of an Investment Proposal

**1. A project costs Rs. 25000/- and has a scrap value of Rs. 5000/- alter 5 years. The net profit before depreciation and taxes for the five years period are expected to be Rs. 5000/- Rs. 6000/- Rs. 7000/- Rs. 8000/- and Rs. 10000/-. You are required: calculate net cashflows. Assume tax rate as 50 %.**

*Sol :*

Cost of the project Rs. 25000/-

Life of the project 5 years

Calculation of depreciation :

$$\text{Depreciation} = \frac{\text{Investment} - \text{Scrap Value}}{\text{Life}}$$

$$\frac{2500 - 5000}{5} = \frac{20000}{5} = \text{Rs. } 4000/-$$

| Year | CFBT Rs. | – | DEP Rs. | = | NP Rs. | – | TAX Rs. | = | PAT Rs. | + | DEP Rs. | = | CFAT Rs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | 5000 | – | 4000 | = | 1000 | – | 500 | = | 500 | + | 4000 | = | 4500 |
| 2. | 6000 | – | 4000 | = | 2000 | – | 1000 | = | 1000 | + | 4000 | = | 5000 |
| 3. | 7000 | – | 4000 | = | 3000 | – | 1500 | = | 1500 | + | 4000 | = | 5500 |
| 4. | 8000 | – | 4000 | = | 4000 | – | 2000 | = | 2000 | + | 4000 | = | 6000 |
| 5. | 10000 | – | 4000 | = | 6000 | – | 3000 | = | 3000 | + | 4000 | = | 7000 |

**Abbreviations :**

CFBT = Cashflows before tax

DEP = Depreciation

NP = Net Profit

TAX = Tax on net profit

PAT = Profit after tax

CFAT = Cashflows after tax or Net cashflows.

**2. The Philips Corporation, which has 50 per cent tax rate is evaluating a project which will cost Rs. 100000/- and will required an increase in the level of inventories and receivable of Rs. 50000/- over its life. The project will generate additional sales of Rs. 100000/- and will require cash expenses of Rs. 30000/- in each year of its five year life. It will be depreciated on a straight line basis. Calculate the project initial investment and net cash flows over its life.**

*Sol :*

**(a) Calculation of initial investment**

Project cost Rs. 1,00,000

(+) Working Capital Required Rs. 50,000

**Total initial investment Rs. 1,50,000**

**(b) Calculation of CFBT :**

Additional sales revenue Rs. 1,00,000

(–) Cash expenses Rs. 30,000

**CFBT Rs. 70,000**

**(c) Calculation of Depreciation :**

$$\text{Depreciation} = \frac{1,00,000 - 00}{5} = \underline{\overline{20,000}}$$

**(4) Calculation or CFAT**

| Year | CFBT | – | DEP | = | NP | – | TAX @50% | = | PAT | + | DEP | = | CFAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rs. | | Rs. | | Rs. | | Rs. | | Rs. | | Rs. | | Rs. |
| 1. | 70,000 | – | 20,000 | = | 50,000 | – | 25,000 | = | 25,000 | + | 20,000 | = | 45,000 |
| 2. | 70,000 | – | 20,000 | = | 50,000 | – | 25,000 | = | 25,000 | + | 20,000 | = | 45,000 |
| 3. | 70,000 | – | 20,000 | = | 50,000 | – | 25,000 | = | 25,000 | + | 20,000 | = | 45,000 |
| 4. | 70,000 | – | 20,000 | = | 50,000 | – | 25,000 | = | 25,000 | + | 20,000 | = | 45,000 |
| 5. | 70,000 | – | 20,000 | = | 50,000 | – | 25,000 | = | 25,000 | + | 20,000 | = | 45,000 |

**Net Cash Flow are**

| Year | Cashflow |
|---|---|
| 1 | 45,000 |
| 2 | 45,000 |
| 3 | 45,000 |
| 4 | 45,000 |
| 5 | 95,000* (45,000 + 50,000/-) |

* 5th year net cash flow includes annual inflow of Rs. 45,000/ -plus realization of networking capital of Rs. 50,000.

**3. Machinery x requires an investment of Rs. 50,000/- estimated to have a by of 5 years. The project is estimated to generated Rs. 12,000/- p.a as CFBT @ 40% for its life time of 5 years. Calculate CFAT.**

*Sol :*

Cost of investment = 50,000

Life = 5 years

$$\text{Depreciation} = \frac{50,000}{5} = 10,000/\text{- p.a}$$

| Particulars | Amount |
|---|---|
| CFBT | 12,000 |
| (–) Dep | 10,000 |
| PBT | 2,000 |
| (–) Tax @ 40 % | 800 |
| PAT | 1,800 |
| (+) Dep | 10,000 |
| CFAT | 11,200 |

$\therefore$ CFAT = 11,200 p.a.

## 2.3 Capital Budgeting Techniques

**Q7. What are the different techniques of Capital Budgeting?**

*Ans :* **(Aug.-17)**

The investment evaluation techniques play a vital role in evaluating a project. Profitability of a firm will increase if the proposal is profitable and vice-versa. Selection of a profitable project will help to maximise value of the firm through the maximisation of profits. Therefore, capital budgeting decisions form the framework for a firm's future development.

As we have seen in the analysis stage, project evaluation involves market analysis, financial analysis, technical analysis, economic analysis, and ecological analysis. In financial analysis, after estimation of the cash flows and required rate of return on the project then the next step is evaluation of various investment alternatives and selection of the most profitable project.

A wide range of criteria has been suggested to judge the worthiness of the investment alternatives. Evaluation techniques are divided into two broad categories, viz., (I) Traditional techniques or non-discounted techniques and (II) Modern techniques or discounted cash flow techniques. Figure shows the two techniques of evaluation of a project.

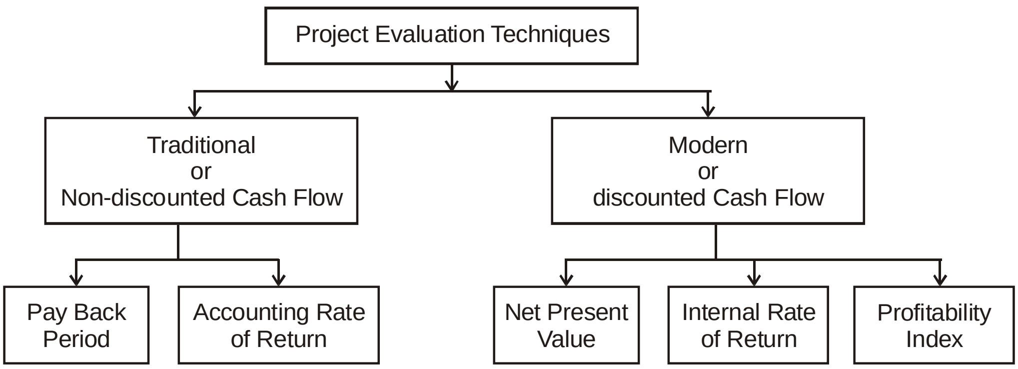


**Fig.: Techniques of Project Evaluation**

There are many methods of evaluating profitability of capital investment proposals. The various commonly used methods are as follows :

**a) Traditional Methods**

i) Pay-back Period Method (or) Pay out or Pay off Method

ii) Improvement of traditional Approach to Pay Back Period Method

iii) Rate of Return Method (or) Accounting Method

**b) Time-adjusted Method/Discounted Methods**

i) Net Present Value Method

ii) Internal Rate of Return (IRR) Method

iii) Profitability Index Method.

**Q8. Explain the Features of Capital Budgeting Technique.**

*Ans :*

Following are some of the features which a capital budgeting evaluation technique should posses :

1. The criterion must be able to incorporate all the cash flows associated with proposal.
2. It should also incorporate the time value of money i.e., the cash flows arising at different point of time must be differentiated in respect of their worth to the firm.
3. It should be capable of ranking different proposals in order of their worth to the firm.
4. It should be objective and unambiguous in its approach. There should not be any scope for subjectivity of the decision maker.
5. The last but the least, the technique must be in the line with the objective of maximisation of shareholders wealth.

### 2.3.1 Traditional Techniques

#### 2.3.1.1 Payback Period

**Q9. Define Payback Period. What are the advantages and disadvantages of Payback Period?**

*Ans :*

The payback period is defined as the number of years required for the proposal's cumulative cash inflows to be equal to its cash outflows. In other words, the payback period is the length of time required to recover the initial cost of the project. The payback period therefore, can be looked upon as the length of time required for a proposal to 'break even' on its net investment.

**Calculation of the Payback Period**

The payback period can be calculated in two different situations:

**1. When Annual Inflows are Equal**

When the cash inflows being generated by a proposal are equal per time period, i.e., the cash inflows are in the form of an annuity, the payback period can be computed by dividing the cash outflow by the amount of annuity.

**2. When the Annual Cash Inflows are Unequal**

In case the cash inflows from the proposal are not in annuity form then the cumulative cash inflows are raised to compute the payback period.

**Advantages of Payback Method**

Following are the advantages of payback methods:

**1. Simple to Operate**

The payback period is simple and easy, in concept as well as in its applications. In particular, it can be adopted by a small firm having limited manpower which does not have any special skill to apply other sophisticated techniques.

**2. Liquidity Indication**

It gives an indication of liquidity. In case a firm is having liquidity problems, then the payback period is a good method to adopt as it emphasizes the earlier cash inflows.

**3. Risk of Obsolescence High**

In a broader sense, the payback period deals with the risk also. The project with a shorter payback period will be less risky as compared to project with a longer payback period, as the cash inflows which arise further in the future will be less certain and hence more risky. So, the payback period helps in weeding out the risky proposals by assigning lower priority.

**Disadvantages of Payback Method**

Following are the disadvantages of payback methods:

1. **Ignores Cash Inflows**

The payback period entirely ignores many of the cash inflows which occur after the payback period. This could be misleading and could lead to discrimination against the proposal which generates substantial cash inflows in later years. It ignores what happens after the initial investment is recouped.

2. **Equal Weightage to all Cash Flows**

It ignores the timing of the occurrence of the cash flows. It considers the cash flows occurring at different point of time as equal in money worth and ignores the time value of money. It gives equal weights to all the cash flows before the payback date and no weight at all to cash flows occurring thereafter.

3. **Ignores Salvage Value**

The payback period also ignores the salvage value and the total economic life of the project. A project which has substantial salvage value may be ignored (though more profitable it may be otherwise) in favour of a project with higher inflows in earlier years. It is insensitive to the economic life span and thus not a truly meaningful criterion for determining the economic viability of a proposal. The speed with which the initial investment is recovered is not a sufficient way to appraise the profitability.

4. **Method of Capital Recovery**

The payback period is more a method of capital recovery rather than a measure of profitability of a project. To recover the capital is not enough, of course, because from an eco-nomic view point one would hope to earn a profit on the funds while they are invested.

### 2.3.1.2 Accounting / Average Rate of Return

**Q10. Define Accounting / Average Rate of Return. What are the advantages and disadvantages of Accounting / Average Rate of Return ?**

*Ans :*

According to this method, the capital investment proposals are judged on the basis of their relative profitability. For this purpose, capital employed and related income is determined according to commonly accepted accounting principles and practices over the entire economic life of the project and then the average yield is calculated. Such a rate is termed as Accounting Rate of Return.

The ARR is also known as Return on Investment (ROI). It is the ratio of average after tax profit to average investment.

**Calculation of ARR**

$$\boxed{\text{ARR} = \frac{\text{Average Annula Profit after Tax}}{\text{Average or Initial Investment}} \times 100}$$

Where,

$$\text{Average Investment} = \frac{\text{Initial Investmet} + \text{Salvage Value}}{2}$$

(or)

$$\frac{\text{Initial investment} - \text{Scrap value}}{2} + \text{Addl.net working capital} + \text{Scrap value}$$

**Advantages of Average Rate of Return**

The advantages of average rate of return method are as follows:

**1. Easy to Calculate**

It is easy to calculate because it makes use of readily available accounting information. In contrast, discounted cash flow technique involves tedious calculations.

**2. Considers Entire Cashflows**

It takes into consideration the entire cash inflows during the project life. Payback Method does not use the entire stream of incomes.

**3. Based on Financial Data**

As this method is based upon accounting concept of profits, it can be readily calculated from the financial data.

**Disadvantages of Average Rate of Return**

The disadvantages of average rate of return method are as follows:

**1. Ignores Time Value of Money**

If we use ARR to compare two projects having equal initial investments. The project which has higher annual income in the latter years of its useful life may rank higher than the one having higher annual income in the beginning years, even if the present value of the income generated by the latter project is higher.

**2. Cost of Project cannot be Determined Accurately**

Future sales and anticipated cost of project over a long period cannot be determined accurately because they are influenced by a large number of outside factors.

**3. Used as the Only Way to Appraise a Project**

It can not be used as the only way to appraise a project. The net present value should be also calculated as calculating only the return of a project can give a distorted image when projects that have significantly different capital expenditure are compared.

**4. Uses Only Accounting Figures**

It uses accounting figures which can be affected by judgment, accounting policies and non cash items (depreciation).

**5. Problem of Comparability**

There are two ways to calculate the accounting rate of return which causes a problem of comparability.

## PROBLEMS ON TRADITIONAL METHODS OF CAPITAL BUDGETING

**4. A project proposal requires a cash outflow of ₹1,00,000 and yield an annual cash inflows of ₹18,500/- for next 7 years. Calculate PBP for a given project.**

*Sol :*

$$\boxed{\text{PBP} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}}$$

$$\Rightarrow \quad \frac{1,00,000}{18,500} = 5.4 \text{ years}$$

**5. A project proposed requires cash outlay of ₹19,000/- and is expected to generate cash inflows of ₹8,000/-, 6,000/-, 4,000/-, 2,000/- and 4,000/- over next 5 years. Calculate PBP for the given projects.**

*Sol :*

In a given problem the cash inflows are unequal so PBP -

$$\boxed{\text{PBP} = \text{Base year} + \frac{\text{Required CFAT}}{\text{Next year CFAT}}}$$

| Year | CFAT | Cumulative CFAT |
|---|---|---|
| 1 | 8,000 | 8,000 |
| 2 | 6,000 | 14,000 |
| 3 | 4,000 | 18,000 |
| 4 | 2,000 | 20,000 |
| 5 | 4,000 | 24,000 |

$$\text{PBP} = 3 + \frac{1000}{2000} = 3.5 \text{ years}$$

**Acceptance Rule for PBP**

Many firms use the PBP as an accept or reject criteria as well as a method of ranking the projects. If the PBP is calculated for a project is less than the std PBP set by the management then such project would be accepted.

If the PBP is more than the std once such project would be rejected.

**6. Calculated PBP for the following projects each project requires initial cash outlay of Rs. 1,00,000/-. If std PBP is 5 years. Suggest which project should be accepted?**

| Year | Cash inflows | | |
|---|---|---|---|
| | A | B | C |
| 1 | 30,000 | 30,000 | 10,000 |
| 2 | 30,000 | 40,000 | 20,000 |
| 3 | 30,000 | 20,000 | 40,000 |
| 4 | 30,000 | 20,000 | 40,000 |
| 5 | 30,000 | 5,000 | – |

*Sol :*

**Project A**

| Year | CFAT |
|---|---|
| 1 | 30,000 |
| 2 | 30,000 |
| 3 | 30,000 |
| 4 | 30,000 |
| 5 | 30,000 |

$$\boxed{PBP = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}}$$

$$\Rightarrow \frac{1,00,000}{30,000} \Rightarrow 3.3 \text{ years}$$

**Project B**

| Year | CFAT | Cumulative CFAT |
|---|---|---|
| 1 | 30,000 | 30,000 |
| 2 | 40,000 | 70,000 |
| 3 | 20,000 | 90,000 |
| 4 | 20,000 | 1,10,000 |
| 5 | 5,000 | 1,15,000 |

$$\boxed{PBP = \text{Base year} + \frac{\text{Required CFAT}}{\text{Next year CFAT}}} \Rightarrow 3 + \frac{10,000}{20,000}$$

$$\Rightarrow 3 + 0.5 = 3.5 \text{ years}$$

**Project C**

| Year | CFAT | Cumulative CFAT |
|---|---|---|
| 1 | 10,000 | 10,000 |
| 2 | 20,000 | 30,000 |
| 3 | 40,000 | 70,000 |
| 4 | 40,000 | 1,10,000 |
| 5 | – | 1,10,000 |

$$\boxed{PBP = \text{Base year} + \frac{\text{Required CFAT}}{\text{Next year CFAT}}}$$

$$\Rightarrow 3 + \frac{30,000}{40,000}$$

$$\Rightarrow 3 + 0.75 = 3.75 \text{ years}$$

**Conclusion**

In a given problem the std PBP for all projects is 5 years. All the 3 projects having less PBP when compared to the std PBP. So, all the 3 projects are acceptable. To rank the projects "Project A" is given 1st priority, as its PBP is less than the other 2 projects B and C.

**7. The following details related to 3 mutually exclusive projects. Find PBP for all the 3 projects. The std PBF is 3 years. Suggest the Management which project should be acceptable. The initial cash outlay of each project is `1,00,000/-**

| Year | Cash Inflows | | |
|---|---|---|---|
| | A | B | C |
| 1 | 30,000 | 30,000 | 40,000 |
| 2 | 30,000 | 50,000 | 50,000 |
| 3 | 30,000 | 40,000 | 10,000 |
| 4 | 30,000 | 20,000 | 20,000 |
| 5 | 30,000 | 10,000 | 20,000 |

*Sol :*

**Project A**

| Year | CFAT |
|---|---|
| 1 | 30,000 |
| 2 | 30,000 |
| 3 | 30,000 |
| 4 | 30,000 |
| 5 | 30,000 |

$$\boxed{PBP = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}} \Rightarrow \frac{1,00,000}{3} \Rightarrow 3.3 \text{ years}$$

**Project B**

| Year | CFAT | Cumulative CFAT |
|---|---|---|
| 1 | 30,000 | 30,000 |
| 2 | 50,000 | 80,000 |
| 3 | 40,000 | 1,20,000 |
| 4 | 20,000 | 1,40,000 |
| 5 | 10,000 | 1,50,000 |

$$\boxed{PBP = \text{Base year} + \frac{\text{Required CFAT}}{\text{Next year CFAT}}} \Rightarrow 2 + \frac{20,000}{40,000}$$

PBP $\Rightarrow$ 2 + 0.5 = 2.5 years

**Project C**

| Year | CFAT | Cumulative CFAT |
|---|---|---|
| 1 | 40,000 | 40,000 |
| 2 | 50,000 | 90,000 |
| 3 | 10,000 | 1,00,000 |
| 4 | 20,000 | 1,20,000 |
| 5 | 20,000 | 1,40,000 |

$\therefore$ The total/initial cash outlay is 1,00,000. We are recovering total amount of 1,00,000 in 3rd year.

$\therefore$ PBP = 3 yrs.

As project 'B' is have less PBP, it should be acceptable.

**8. A project requires an investment of `6,00,000 and has a scrap value of `30,000 after 4 years. It is expected to yield profits after depreciation and taxes during the four years amounting to `40,000, `60,000, `50,000 and `30,000. Calculate ARR on the investment.**

*Sol :*

Total profits = 40,000 + 60,000 + 50,000 + 30,000 = 1,80,000

$$\text{Average profit} = \frac{1,80,000}{4} = 45,000$$

$$\text{Average investment} = \frac{6,00,000 - 30,000}{2} = 2,85,000$$

$$\text{ARR} = \frac{\text{Average Profit}}{\text{Average Investment}} \times 100$$

$$\text{ARR} = \frac{45,000}{2,85,000} \times 100 = 15.8\%$$



**9. A machine will cost ` 2,00,000. It is expected to provide profits before depreciation of ` 60,000 each in 1st and 2nd years and ` 80,000 each in 3rd and 4th years. Assuming a straight line depreciation and no taxes what is the average accounting rate of return? What will be your answer if the tax rate is 30%?**

*Sol :* **(Aug./Sept. - 15)**

**(i) Calculation of Average Accounting Rate of Return (on straight line depreciation and no taxes)**

| Year | Profit Before Depreciation and Tax (`) | Depreciation (`) | Profit Before Tax (`) |
|---|---|---|---|
| 1 | 60,000 | 50,000 | 10,000 |
| 2 | 60,000 | 50,000 | 10,000 |
| 3 | 80,000 | 50,000 | 30,000 |
| 4 | 80,000 | 50,000 | 30,000 |
| | | **Total** | **80,000** |

$$\text{Average profit} = \frac{\text{Total Profit}}{\text{Number of Years}} = \frac{10,000 + 10,000 + 30,000 + 30,000}{4}$$

$$= \frac{80,000}{4} = 20,000$$

$$\text{Average profit} = \frac{\text{Original Investment}}{2}$$

$$= \frac{2,00,000}{2} = 1,00,000$$

$$\text{Average Accounting Rate of Return (ARR)} = \frac{\text{Annual Average net earnings}}{\text{Average investment}} \times 100$$

$$= \frac{20,000}{1,00,000} \times 100 = 20\%$$

**(ii) Calculation of Average Accounting Rate of Return (on Straight line depreciation) when the tax rate is 30%.**

| Year | Profit Before Depreciation and Tax (`) | Depreciation (`) | Profit Before Tax (`) | Tax @ 30% | Profit After Tax(`) |
|---|---|---|---|---|---|
| 1. | 60,000 | 50,000 | 10,000 | 3,000 | 7,000 |
| 2. | 60,000 | 50,000 | 10,000 | 3,000 | 7,000 |
| 3. | 80,000 | 50,000 | 30,000 | 9,000 | 21,000 |
| 4. | 80,000 | 50,000 | 30,000 | 9,000 | 21,000 |
| | | | | **Total** | **56,000** |

$$\text{Average profit after tax} = \frac{7,000 + 7,000 + 21,000 + 21,000}{4} = 14,000$$

$$\text{Average Investment} = \frac{\text{Original Investment}}{2}$$

$$= \frac{2,00,000}{2} = 1,00,000$$

$$\text{Average Accounting Rate of Return (ARR)} = \frac{\text{Annual average net earnings}}{\text{Average investment}} \times 100$$

$$= \frac{14,000}{1,00,000} \times 100 = 14\%$$

If the tax rate is 30% the ARR is 14%

Thus, machine is more profitable when there is no tax rate (i.e., ARR = 20%).

**Working Notes**

$$\text{Depreciation} = \frac{\text{Initial Investment}}{\text{Number of Years}}$$

$$= \frac{2,00,000}{4} = 50,000.$$

### 2.3.2 Discounting Cashflow Method (DCF)

**Q11. Define discounted cashflow method. Explain merits and demerits of Discounted cashflow method.**

*Ans :*

The time-adjusted or discounted cash flow methods take into account the profitability and also the time value of money. These methods also called modern methods of capital budgeting are becoming increasingly popular day by day.

**Merits**

1. The discounted cash flow methods take into consideration the time value of money to make effective capital budgeting decisions.
2. These methods give more emphasis to early inflows than later inflows.
3. These methods are suitable in situation where cash flows are uneven.
4. The entire economic life of the project investment and income is considered by these methods.
5. These methods makes possible comparison of projects having different capital outlays, different lives, different timings of cash flows.

**Demerits**

1. These methods do not take into account the time value of money. A rupee today is definitely worth more than a rupee after an year. This basic fact is ignored by these methods.
2. Cost of capital is not considered, which is a crucial element in making investment decisions.
3. Cash flows are not involved in analysis which are more significant than the accounting profits.
4. Investment in a project in any circumstances is to be made in installments then traditional methods are not applicable.

Modern techniques are again subdivided into three, viz.,

(a) Net present value,

(b) Internal rate of return or trial and error, and

(c) Profitability index or discounted benefit cost ratio.

### 2.3.2.1 Net Present Value

**Q12. Define Net Present Value. Explain advantages and disadvantages of NPV.**

*Ans :*

The cash inflow in different years are discounted (reduced) to their present value by applying the appropriate Miscount factor or rate and the gross or total present value of cash flows of different years are ascertained. The total present value of cash inflows are compared with present value of cash outflows (cost of project) and the net present value or the excess present value of the project and the difference between total present value of cash inflow and present value of cash outflow is ascertained.

**Calculation of NPV**

The following four steps constitute a net-present-value analysis of an investment proposal:

1. Prepare a table showing the cashflows during each year of the proposed investment.
2. Compute the present value of each cashflow, using a discount rate that reflects the cost of acquiring investment capital. This discount rate is often called the hurdle rate or minimum desired rate of return.
3. Compute the net present value, which is the sum of the present values of the cashflows.
4. If the Net Present Value (NPV) is equal to or greater than zero, accept the investment proposal. Otherwise, reject it.

The present value of `1 due in any number of years can be found with the use of the following mathematical formula:

$$PV = \frac{1}{(1+r)^n}$$

Where, PV = Present Value; r = Rate of interest/discount rate; n = Number of years

Net present value gives explicit consideration to the time value of money; it is considered a sophisticated capital budgeting technique. All such techniques in one way or another, discount the firm's cash flows at a specified rate. This rate often called the discount rate, required return, cost of capital, or opportunity cost is the minimum return that must be earned on a project to leave the firm's market value unchanged.

The NPV is found by subtracting the present value of project's cash outflows ($CF_0$) from the present value of its cash inflows ($CF_t$) discounted at a rate equal to the firm's cost of capital (k).

**NPV = Present Value of Cash Inflows - Present Value of Cash Outflows**

$$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} - CF_0 = \sum_{t=1}^{n} \left(CF_t \times PVIF_{k,t}\right) - CF_0$$

**Accept-Reject Decision**

When NPV is used to make accept-reject decisions, the decision criteria are as follows:

| | |
|---|---|
| NPV > Zero | Accept the proposal |
| NPV < Zero | Reject the proposal |
| NPV = Zero | Indifference |

**Advantages**

The advantages of NPV method for evaluating investment proposals are as follows:

**1. Recognition of Time Value of Money**

The most significant advantage is that it explicitly recognizes the time value of money, e.g., total cash flows pertaining to two machines are equal but the net present value are different because of differences of pattern of cash streams. The need for recognizing the total value of money is thus satisfied.

**2. Sound Method of Appraisal**

It also fulfils the second attribute of a sound method of appraisal. In that it considers the total benefits arising out of proposal over its life time.

**3. Selection of Mutually Exclusive Projects**

It is particularly useful for selection of mutually exclusive projects.

**4. Maximization of the Shareholder's Wealth**

This method of asset selection is instrumental for achieving the objective of financial management, which is the maximization of the shareholder's wealth. In brief the present value method is a theoretically correct technique in the selection of investment proposals.

**Disadvantages**

Disadvantages of NPV method are:

1. **Difficult to Understand**

   It is difficult to calculate as well as to understand and use, in comparison with payback method or average return method.

2. **May not Give Accurate Decision**

   NPV can not give accurate decision if the amounts of investment of mutually exclusive projects are not equal.

3. **Difficult Calculation**

   The second and more serious problem associated with present value method is that it involves calculations of the required rate of return to discount the cash flows. The cost of capital is generally the basis of the firm's discount rate. The calculation of cost of capital is very complicated. In fact there is a difference of opinion even regarding the exact method of calculating it.

4. **Absolute Measure**

   Another shortcoming is that it is an absolute measure. This method will accept the project which has higher present value. But it is likely that this project may also involve a larger initial outlay. Thus, in case of projects involving different outlays, the present value may not give dependable results.

### 2.3.2.2 Internal Rate of Return

**Q13. What is Internal Rate of Return? How is it calculated? State the merits and demerits of Internal Rate of Return.**

*Ans :*

The internal rate of return is also one of the capital budgeting technique that identifies the time value of money. This method is also known as yield method, discounted rate of return and trial and error yield method. It is that rate of return which equates the present value of cash inflows to the present value of cash outflows. The hit and trial method is used in internal rate of return method to discount the cash flows of the project as discount rate is not known. The internal rate of return is calculated with the help of the following formula.

$$C = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + ..... + \frac{A_n}{(1+r)^n}$$

Where,

C – Initial outlay at time zero

r – Rate of discount of internal rate of return

$A_1$ , $A_2$, ... $A_n$ – Future net cash flows at different periods

n – Number of years.

The internal rate of return method involves following steps,

1. Calculate the future cash inflows before depreciation but after tax.
2. Calculate fake payback period by dividing the initial investment by average cash flows. Initial investment

$$\text{Fake payback period} = \frac{\text{Initial investment}}{\text{Average cash flows}}$$

3. Identify the discounting factor from present value annuity table and calculate NPV with that percentage.
4. If NPV is positive take a higher rate and if NPV is negative take a lower rate and once again calculate NPV.
5. After getting one positive NPV and one negative NPV, use interpolation to calculate actual IRR.

   Actual IRR can be calculated by using the following formula,

$$\text{Lower rate} + \frac{\text{Present value at lower rate} - \text{Cash outflow}}{\text{PV at lower rate} - \text{PV at higher rate}} \times \text{Difference in the rates}$$

A particular project is accepted when IRR is more than cost of capital and if IRR of the project is less than cost of capital it is rejected.

**Merits**

1. IRR also take into consideration the time value of money and easily applicable to situations in which even and uneven cash flows exists.
2. It helps in calculating true profitability of the project as it consider all profits of the project.
3. The ascertainment of cost of capital is not very important as in case of NPV method.
4. It is suitable for goal of maximizing profits and it is one of the dependable techniques of capital budgeting. Demerits

**Demerits**

1. The internal rate of return is one of the difficult method for evaluation of investment proposals.
2. If the expected life, size and cash outlays of the projects are not equal then the result of NPV and IRR will also differ.
3. When different rates are used it may create confusion.

**Q14. Under what conditions would the internal rate of return be reciprocal of the payback period?**

*Ans :* **(Sept-14)**

Payback period is useful in some conditions where its reciprocal proves to be a good approximation rate of return.

$$\text{Payback Period} = \frac{\text{Initail Investment}}{\text{Annual Cash Inflow (Annuity)}} = \frac{C_0}{C}$$

$$\text{Present value of an annuity} = C_0 = C\left[\frac{1 - \frac{1}{(1+r)^h}}{r}\right]$$

$$C_0 = \frac{C}{r} - \frac{C}{r}\left[\frac{1}{(1+r)^n}\right]$$

Both sides are multiplied by r, we get,

$$rC_0 = C - C\left[\frac{1}{(1+r)^n}\right]$$

then, $$\boxed{r = \frac{C}{C_0} - \frac{C}{C_0}\left[\frac{1}{(1+r)^n}\right]}$$

Where,

$C_0$ = Initial investment

C = Annual cash inflow

r = Rate of return

h = Life of investment.

From the above equation, it is clear that first right hand is same as the reciprocal of the payback period and second right hand term is payback reciprocal multiplied by, $\frac{1}{(1+r)^n}$. If the value of *n* is very large or extends to infinity then second term equals to zero and the left over the term will be $C/C_0$ . Hence, IRR is equal to the reciprocal of payback.

Following are the two conditions under which reciprocal of payback will be equal to IRR,

1. When project life is too long or twice the payback period.
2. When project yields equal cash inflow annually throughout the life.

The technique of reciprocal payback is useful in identifying true rate of return. But it involves a limitation i.e., it is not possible that every investment project satisfy the above conditions. Sometimes, life of the project will not be twice of payback period then in this case the payback reciprocal will be more than rate of return. In the same way, it is not compulsory for every project to generate even cash inflows every year.

### 2.3.2.3 Profitability Index

**Q15. Define Profitability Index. How is it calculated? State the merits and demerits of Profitability Index.**

*Ans :* **(Aug.-17, Sep.-15)**

The profitability index (PI) refers to the ratio of discounted benefits over the discounted costs. It is an Evaluation of the profitability of an investment and can be compared with the profitability of other similar investments which are under consideration. The profitability index is also referred to as benefit-cost ratio, cost- benefit ratio, or even capital rationing.

**Calculation of Profitability Index**

The profitability index is one of the numerous ways used to quantify and measure the efficiency of a proposed investment. Calculation of PI is done by the following formula:

$$\text{Profitability Index} = \frac{\text{Present Value of Cashinflows}}{\text{Present Value of Cashoutflows}}$$

The profitability index may be found for net present values of inflows:

PV of Cash inflows

$$\text{P.I. (Net)} = \frac{\text{NPV (Net Present Value)}}{\text{Initial Cash outlay}} \text{ or P. I.} = \frac{\text{PV of Cash inflows}}{\text{Initia Cash outlay}}$$

The net profitability index can also be found as Profitability Index (gross) minus one.

**Accept-Reject Decision**

When PI is used to make accept-reject decisions, the decision criteria are as follows:

PI > 1 Accept the proposal

PI < I Reject the proposal

PI = 0 Indifference

**Advantages of Profitability Index Method**

Following are the advantages of profitability index method:

1. It is consistent with the goal of maximizing the shareholders wealth.
2. It recognizes the time value of money.
3. It considers analysis all cash flows of entire life.
4. It makes the right in the case of different amount of cash outlay of different project.
5. It ascertains the exact rate of return of the project.
6. It helps in ranking and picking projects while rationing of capital.

**Disadvantages of Profitability Index Method**

Following are the advantages of profitability index method:

1. It is requires detailed long term forecasts of the incremental benefits and costs.
2. It poses difficulty in understanding interest rate or discount rate.
3. It is difficult to calculate profitability index if two projects having different useful life.

## PROBLEMS ON NPV, IRR AND PI

**10. Calculate NPV for the given project.**

| Year | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| (A) Cash flows | 200 | 35 | 80 | 90 | 75 | 20 |
| (B) Cash flows | 200 | 18 | 10 | 10 | 40 | 35 |

The company anticipates the cost of capital of 12%. Rank the project according to it ?

*Sol :*

**Calculation of NPV for Project A**

| Year | CFAT | PV. factor @ 12% | PV CFAT |
|---|---|---|---|
| 1 | 35 | 0.893 | 31.255 |
| 2 | 80 | 0.797 | 63.76 |
| 3 | 90 | 0.712 | 64.08 |
| 4 | 75 | 0.636 | 47.7 |
| 5 | 20 | 0.567 | 11.34 |
| | | | 218.135 |

$\boxed{NPV = \Sigma PV.CFAT - \Sigma PV\ Co}$

= 218.135 – 200 = 18.135

**Calculation of NPV for Project B**

| Year | CFAT | PV. factor @ 12% | PV CFAT |
|---|---|---|---|
| 1 | 8 | 0.893 | 16.074 |
| 2 | 10 | 0.797 | 7.97 |
| 3 | 10 | 0.712 | 7.12 |
| 4 | 40 | 0.636 | 25.44 |
| 5 | 35 | 0.567 | 19.845 |
| | | | 76.444 |

$\boxed{NPV = \Sigma PV.CFAT - \Sigma PV\ Co}$

76.44 – 200 = (–123,556)

**11. A firm whose cost of capital is 10% considering two mutually exclusive projects X and Y. The details of which are:**

| Particulars | Project A Rs. | Project B Rs. |
|---|---|---|
| **Investment** | **Rs. 50,000** | **Rs. 50,000** |
| **Life** | **5 years** | **5 years** |
| **Cost of Capital 10%** | | |
| **Tax Rate 50%** | | |

**Cash flows before depreciation and taxes (CFBT) are as follows:**

| Year | Rs. | Rs. |
|---|---|---|
| **1** | **20,000** | **30,000** |
| **2** | **22,000** | **27,000** |
| **3** | **28,000** | **22,000** |
| **4** | **25,000** | **25,000** |
| **5** | **30,000** | **20,000** |

**Which Project should be accepted under NPV method?**

*Sol :*

**Project : A**

**Calculation of Net Cash Flows (CFAT)**

| Year | CFBT | – | DEP | = | NP | – | TAX @50% | = | PAT | + | DEP | = | CFAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | 20,000 | – | 10,000 | = | 10,000 | – | 5,000 | = | 5,000 | + | 10,000 | = | 15.000 |
| 2. | 22,000 | – | 10,000 | = | 12,000 | – | 6,000 | = | 6,000 | + | 10,000 | = | 16.000 |
| 3. | 28,000 | – | 10,000 | = | 18,000 | – | 9,000 | = | 9,000 | + | 10.000 | = | 9.000 |
| 4. | 25,000 | – | 10,000 | = | 15,000 | – | 7,500 | = | 7,500 | + | 10.000 | = | 17,500 |
| 5. | 30,000 | – | 10,000 | = | 20,000 | – | 10,000 | = | 10,000 | + | 10,000 | = | 20.000 |

Depreciation $= \dfrac{50,000 - 0}{5}$

= Rs. 10,000

**Calculation of net present value**

| Year | CFAT Rs. | Discount * Factor @ 10% | Total Present Value |
|---|---|---|---|
| 1 | 15,000 | 0.909 | 13,635.00 |
| 2 | 16,000 | 0.826 | 13,216.00 |
| 3 | 19,000 | 0.751 | 14,269.00 |
| 4 | 17,500 | 0.683 | 11,952.50 |
| 5 | 20,000 | 0.621 | 12,420.00 |
| | | Total present value | 65,492.50 |
| | | Investment | 50,000.00 |
| | | Net Present Value Rs. | 15,492.00 |



**Project : B**

**1) Calculation of CFAT**

| Year | CFBT | – | DEP | = | NP | – | TAX @50% | = | PAT | + | DEP | = | CFAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | 30,000 | – | 10,000 | = | 20,000 | – | 10,000 | = | 10,000 | + | 10,000 | = | 20,000 |
| 2. | 27,000 | – | 10,000 | = | 17,000 | – | 8,500 | = | 8,500 | + | 10,000 | = | 18,500 |
| 3. | 22,000 | – | 10,000 | = | 12,000 | – | 6,000 | = | 6,000 | + | 10.000 | = | 16,000 |
| 4. | 25,000 | – | 10,000 | = | 15,000 | – | 7,500 | = | 7,500 | + | 10.000 | = | 17,500 |
| 5. | 20,000 | – | 10,000 | = | 10,000 | – | 5,000 | = | 5,000 | + | 10,000 | = | 15,000 |

Depreciation $= \dfrac{50,000 - 0}{5}$ = Rs. 10,000

**2) Calculation of Net Present Value**

| Year | CFAT Rs. | Discount * Factor @ 10% | Total Present Value |
|---|---|---|---|
| 1 | 20,000 | 0.909 | 18,180.00 |
| 2 | 18,500 | 0.826 | 15,281.00 |
| 3 | 16,000 | 0.751 | 12,016.00 |
| 4 | 17,500 | 0.683 | 11,952.50 |
| 5 | 15,000 | 0.621 | 9,315.00 |
| | | Total present value | 66,774.50 |
| | | - Initial Investment | 50,000.00 |
| | | Net Present Value Rs. | 16,744.50 |

Since NPV of project B is higher than that of project A , it is advisable to select project B.

**12. Calculate IRR if the project requires an initial outlay of Rs. 6,000/- and expected to generate equal cash inflows of Rs. 2,000/- Pa. The project is having a life of 5 years. Advice the management if the co's cost of capital is 15%.**

*Sol :*

In the given problem the cash inflows are equal.

**Step 1 : Calculate PBP**

$$\boxed{\text{PBP} = \frac{\text{Initial Invst}}{\text{Annual cash inflow}}} = \frac{6,000}{2,000} = 3 \text{ years}$$

**Step 2 :**

Search for 2 discount factor nearest to PBP in annuity Re 1 table.

$\therefore$ 19% and 20% are two discounting factor.

(3.058) (9.991)

**Step 3 : Use IRR formulae**

$$\boxed{\text{IRR} = r_L + \frac{Df_{rL} - \text{PBP}}{Df_{rL} - Df_{rh}} \times \Delta r}$$

$$\Rightarrow \quad 19\% + \frac{3.058 - 3}{3.058 - 2.991} \times (20 - 19)$$

$$\Rightarrow \quad 19\% + \frac{0.058}{0.067} \times 1 \Rightarrow 19\% + 0.865$$

$\therefore$ 19.865%

**Step 4 : Decision Rule**

In the given problem IRR > K i.e., 19.865 > 15 % let so, accept the project.

**13. Phoenix Company is considering two mutually exclusive investments. Project P and Project Q. The expected cash flows of these projects in millions of rupees are as follows,**

| Year | Project P | Project Q |
|---|---|---|
| 0 | (1000) | (1600) |
| 1 | (1000) | 200 |
| 2 | (500) | 400 |
| 3 | (250) | 600 |
| 4 | 2000 | 800 |
| 5 | 4000 | 200 |

**(a) What is the IRR for each project?**

**(b) Which project would you choose if the cost of capital is (i) 10%? (ii) 20%?**

*Sol :* **(Feb./March-16)**

**Project 'P'**

**Calculation of NPV and IRR**

| Year | Cash Flow (`) | PV @ 10% | PVCF | PV @ 20% | PVCF |
|---|---|---|---|---|---|
| 0 | (1000) | 1.00 | – 1000 | 1.00 | – 1000 |
| 1 | (1000) | 0.909 | – 909 | 0.833 | – 833 |
| 2 | (500) | 0.826 | – 413 | 0.694 | – 347 |
| 3 | (250) | 0.751 | – 187.75 | 0.579 | – 144.75 |
| 4 | 2000 | 0.683 | 1366 | 0.482 | 964 |
| 5 | 4000 | 0.621 | 2484 | 0.402 | 1608 |
| Net Present Value (NPV) | | | 1340.25 | | 247.25 |

$$\text{IRR} = 10 + \frac{1340.25}{1340.25 - 247.25} \times (20 - 10)$$

$$= 10 + \frac{1340.25}{1093} \times 10$$

$$= 10 + (1.226 \times 10)$$

$$= 10 + 12.26$$

$$= 22.26.$$

**Project 'Q'**

**Calculation of NPV and IRR**

| Year | Cash Flow (`) | PV @ 10% | PVCF | PV @ 20% | PVCF |
|---|---|---|---|---|---|
| 0 | (1600) | 1.00 | – 1600 | 1.00 | – 1600 |
| 1 | 200 | 0.909 | 181.8 | 0.833 | 166.6 |
| 2 | 400 | 0.826 | 330.4 | 0.694 | 277.6 |
| 3 | 600 | 0.751 | 450.6 | 0.579 | 347.4 |
| 4 | 800 | 0.683 | 546.4 | 0.482 | 385.6 |
| 5 | 200 | 0.621 | 124.2 | 0.402 | 804 |
| **Net Present Value (NPV)** | | | **33.4** | | **– 342.4** |

$$IRR = 10 + \frac{33.4}{33.4-(-342.4)} \times (20-10) = 10 + \frac{33.4}{375.8} \times 10$$

$$= 10 + (0.0888 \times 10) = 10 + 0.89$$

$$= 10.89$$

∴ Project 'P' should be selected, as it has higher NPV and IRR 22.26 than project 'Q'.

**14. Calculate the NPV and IRR of a project, the cash flows of which are as follows, (Amount in lakhs of Rupees)**

| **Years** | **1** | **0** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| **Investment** | **80** | | | | | |
| **Cash Inflows** | | **30** | **40** | **50** | **30** | **10** |

**Additional Information:**

**(a) The cost of capital is 10%.**

**(b) Salvage value at the end of 5th year is zero.**

*Sol :* **(Aug./Sept.-16)**

**Calculation of NPV at 10% (Cost of Capital)**

| Year | Cash Flows | PV Factor at 10% | PVC (`) |
|---|---|---|---|
| 1 | 30 | 0.909 | 27.27 |
| 2 | 40 | 0.826 | 33.04 |
| 3 | 50 | 0.751 | 37.55 |
| 4 | 30 | 0.683 | 20.49 |
| 5 | 10 | 0.621 | 6.21 |
| | | **Present Value** | **124.56** |
| | | **Less:** Initial Investment | 80 |
| | | **NPV** | **44.56** |

NPV @ 10% cost of capital is ` 44.56.

**IRR**

The present value of project is 124.56 at 10% or a positive NPV is 44.56. Therefore, a higher rate is to be considered say 31% for positive and 32% for negative NPV to calculate IRR.

**Calculation of NPV at 31% and 32%**

| Year | Cash Flow | PVF @ 31% | PVCF (`) | PVF @ 32% | PVCF (`) |
|---|---|---|---|---|---|
| 1 | 30 | 0.763 | 22.89 | 0.758 | 22.74 |
| 2 | 40 | 0.583 | 23.32 | 0.574 | 22.96 |
| 3 | 50 | 0.445 | 22.25 | 0.435 | 21.75 |
| 4 | 30 | 0.340 | 10.2 | 0.329 | 9.87 |
| 5 | 10 | 0.259 | 2.59 | 0.250 | 2.50 |
| | | **Present Value** | **81.25** | | **79.82** |
| | | **Less:** Initial Investment | 80.00 | | 80.00 |
| | | **NPV** | **1.25** | | **0.18** |

**Interpolation**

$$IRR = \text{Lower rate} + \frac{\text{NPV at Lower rate}}{\text{Change in PVCF}} \times (HR - (LR))$$

$$= 31 + \frac{1.25}{1.43} \times (32 - 31)$$

$$= 31 + 0.8741 \times 1$$

$$= 31 + 0.8741$$

$$= 31.87.$$

**15. A company is planning to purchase a machine to meet the increased demand for its products in the market. The machine costs Rs. 5,00,000 and has no salvage value. The expected life of the machine is 5 years, and the company employs straight line method of depreciation for tax purposes. The estimated earnings after taxes are Rs. 50,000 each year for 5 years. The after-tax required rate of return of the company is 12 percent. Determine the IRR.**

*Ans :* **(Dec.-19)**

**Determination of IRR**

Depreciation = ` 1,00,000

Cost of capital = 12%

Cost of Machine = ` 5,00,000

Life period = 5 years

CAT = ` 50,000/-

$$\text{Depreciation} = \frac{\text{Machine cost}}{\text{Life of asset}} = 5,00,000 / 5 = \text{`}\ 1,00,000$$

Calculation of CFBDAT Cashflow before Depreciation after Tax

| Year | CFAT | Deprecation | CFBDAT |
|---|---|---|---|
| 1 | 50,000 | 1,00,000 | 1,50,000 |
| 2 | 50,000 | 1,00,000 | 1,50,000 |
| 3 | 50,000 | 1,00,000 | 1,50,000 |
| 4 | 50,000 | 1,00,000 | 1,50,000 |
| 5 | 50,000 | 1,00,000 | 1,50,000 |

**Calculation of NPV @ 12%**

| Years | Cash flows | PV of @12% | PVCF |
|---|---|---|---|
| 1 | 1,50,000 | 0.893 | 1,33,950 |
| 2 | 1,50,000 | 0.797 | 1,19,550 |
| 3 | 1,50,000 | 0.712 | 1,06,800 |
| 4 | 1,50,000 | 0.636 | 95,400 |
| 5 | 1,50,000 | 0.567 | 85,050 |
| | | Total PV | 5,40,750 |
| | | (–) Cost of Machine | 5,00,000 |
| | | NPV | 40,750 |

**Calculation of NPV @ 20%**

| Years | Cash flows | PV Factor @ 20% | PVCF |
|---|---|---|---|
| 1 | 1,50,000 | 0.833 | 1,24,950 |
| 2 | 1,50,000 | 0.694 | 1,04,100 |
| 3 | 1,50,000 | 0.579 | 86,850 |
| 4 | 1,50,000 | 0.482 | 72,300 |
| 5 | 1,50,000 | 0.402 | 60,300 |
| | | Total PV | 4,48,500 |
| | | (–) COF | 5,00,000 |
| | | NPV | (–) 51,500 |

**Calculation of IRR**

$$\text{IRR} = \text{Lower rate} + \frac{\text{NPV at Lower rate}}{\text{Change in PVCF}} \times (\text{HR} - (\text{LR}))$$

$$\text{IRR} = 12 + \frac{40750}{40750-(-51,500)} \times (20-12)$$

IRR = 12 + (0.4419 × 8)

IRR = 12 + 3,535 = 15,535

IRR = 15,535.

## 2.4 The NPV vs. IRR Debate

**Q16. Explain the similaries between NPV and IRR.**

*Ans :*

**Similarities of Results under NPV and IRR**

Both NPV and IRR methods would show similar results in terms of accept or reject decisions in the following cases:

i) Independent investment proposals which do not compete with one another and which may be either accepted or rejected on the basis of a minimum required rate of return.

ii) Conventional investment proposals which involve cash outflows or outlays in the initial period followed by a series of cash inflows.

The reason for similarity of results in the above cases lies in the basis of decision-making in the two methods. Under NPV method, proposal is accepted if its net present value is positive, whereas, under IRR method it is accepted if the internal rate of return is higher than the cut off rate. The projects which have positive net present value, also have an IRR higher than the required rate of return.

**Q17. Difference between NPV and IRR.**

**(OR)**

**How IRR differ from NPV.**

*Ans :* **(July-18)**

The differences between NPV and IRR are as follows,

**1. Ranking Mutually Exclusive Projects**

Mutually exclusive projects are those in which only one investment proposal is accepted and others are ignored. The NPV and IRR methods may result in inconsistent ranking of mutually exclusive projects.

Following are the conditions in which NPV and IRR rules results in inconsistent ranking.

(a) The cash flow pattern of the projects may change i.e., cash flows of one project may increase and cash flows of other projects may fall.

(b) Even the initial investment of the projects may change.

(c) The duration of life may be different for different projects.

**2. Incremental Approach**

In order to select a profitable project from mutually exclusive projects by using IRR method, it is necessary to calculate rate of return on the incremented cash flows.

**3. Reinvestment Assumption**

Occasionally, NPV and IRR rules depends on the implied assumption of reinvestment of cash flows which were produced in the lifetime of project. It is explained that conflict between NPV and IRR arise due to differences in their implicit reinvestment rates. When IRR method is used, cash flows must be reinvested on its internal rate of return and in case of NPV method, cash flows must be reinvested on its opportunity cost of capital.

**4. Changing Cost of Capital and the IRR Rule**

It is assumed that, opportunity cost of capital is constant throughout the period. But, it is not possible in real life. The IRR rule may result in many complexities if opportunity cost of capital fluctuates.

When opportunity cost of capital fluctuates, NPV is calculated as,

$$\boxed{NPV = \frac{C_1}{(1+K_1)^1} + \frac{C_2}{(1+K_2)^2} + .... + \frac{C_n}{(1+K_n)^n} - C_o}$$

Every period have an opportunity cost of capital, it is difficult to compare IRR with any of these costs. It is easy to evaluate NPV with different opportunity costs when compared to IRR.

## 2.5 Approaches for Reconciliation

**Q18. Explain about approaches to reconciliation.**

*Ans :*

The conflicts in project rankings may arise due to size disparity, time disparity and life disparity.

**i) Time Disparity**

Usually, the differences between-NPV and IRR methods is found due to differences in timing of cash flows. When large cash inflows are made in initial stage of project. It leads to higher rate of return and if large cash inflows are made in final stage of project, it results in higher NPV but rate of return will be less.

In order to maximize the shareholder's wealth firm must select the project with higher NPV. In case of mutually exclusive projects, NPVs of all projects must be compared and project with highest NPV must be selected.

**ii) Size Disparity**

The conflicts between NPV and IRR methods may arise due to unequal amount of cash outflows. As NPV method give clear results and focus on objective of shareholder's wealth maximization, the project which gives higher NPV must be accepted. The result of NPV is same as the results of internal rate of return on incremental investment.

**iii) Life Disparity**

When two mutually exclusive projects have different life spans they result in conflict between NPV and IRR rules. Let us assume two projects A and B are mutually exclusive and both have same amount of initial outcome. But project A generate cash inflows at the end of first year, whereas project B provide cash inflows at the end of fifth year.

When NPV method is used project is more profitable and in terms of IRR, project A is best. Firm must select the project with higher NPV because it emphasis on wealth maximizations principle.

## 2.6 Capital Budgeting Decision under Conditions of Risk and Uncertainty

**Q19. Explain capital budgeting techniques decisions under risk and uncertainty. Discuss the sources and perspectives of risk.**

*Ans :*

In present scenario, estimation of future cash flows is not an easy task. Every decision involves a risk factor and it is not possible to estimate an accurate percentage of risk, hence it may lead to wrong decision when estimated cash flows are not equal to actual cash flows.

Capital budgeting decisions are significant due to many reasons and if the decision is wrong then it may cause wastage of lost of scarce resources. Therefore, it is necessary to adjust the future cash flows with the risk. So that it can minimize the difference between estimated and actual cash flows.

Risk and uncertainty are used interchangeably but they have some difference. Risk can be estimated upto certain limit whereas uncertainty is of unpredictable nature which cannot be estimated. Risk is defined as the changes that are possible to occur in the future cash flows of specific investment proposal.

In order to manage risk many techniques are developed. They are,

| Conventional Techniques | | Statistical Techniques | |
|---|---|---|---|
| 1. | Risk adjusted discount rate. | 1. | Probability distribution approach. |
| 2. | Certainty equivalents. | 2. | Decision tree approach. |
| 3. | Sensitivity analysis. | | |

Apart from this, scenario analysis is also developed.

Risk is sometimes distinguished from uncertainty. Risk is referred to a situation where the probability distribution of the cash flow of an investment proposal is known. It no information is available to formulate a probability distribution of the cas flows the situation is known as uncertainty. Most of the them do not recognize this distinction and use the two terms interchangeably.

### Sources and Perspectives of Risk

Risk is common in every business, it is the probability of happening something wrong in future. A project involves risk which emerge from different sources. Some of the important sources are explained below,

**A) Sources of Risk**

i) **Project Specific Risk :** In project-specific risk, the earnings and cash flows are less than the estimated cash flows due to some specific drawback of project like poor management or inaccurate estimates.

ii) **Competitive Risk :** In competitive risk, unexpected actions of competitors influence the earnings and cash flows of the project.

iii) **Industry Specific-Risk :** If the industry to which the project belongs have unexpected trends in technological developments and any changes in authorities may influence earnings and cash flows.

iv) **Market Risk :** In market risk, there is unexpected changes in macro-economic factors like the GDP growth rate, interest rate and inflation and all the projects are affected by this factors in different proportions.

v) **International Risk :** International risk in foreign projects where earnings and cash flows are not the same as expected because of exchange rate risk or political risk.

**B) Perspectives on Risk**

A project can be observed from three different perspectives. They are,

(a) **Stand-alone Risk :** When a project is observed in isolation it is known as stand-alone risk.

(b) **Firm Risk :** The share of a project in risk of the firm is known as firm risk which is also termed as corporate risk.

(c) **Market Risk :** When risk of a project is observed by diversified investor is known as market risk. It is also termed as systematic risk.

**Q20. Explain the various techniques of capital budgeting under risk and uncertainty.**

*Ans :*

**1. Risk-adjusted discount rate**

The simplest method of accounting for risk in capital budgeting is to increase the cut-off rate or the discount factor by certain percentage on account of risk. The projects which are more risky and which have greater variability in expected returns should be discounted at a higher rate as compared to the projects which are less risky and are expected to have lesser variability in returns. The greatest drawback of this method is that it is not possible to determine the risk premium rate appropriately and moreover it is the future cash flow which is uncertain and requires adjustment and not the discount rate.

**2. Certainty equivalent method**

This method is to reduce expected cash flows by certain amounts. It can be employed by multiplying the expected cash flows by certainty equivalent coefficients as to convert the uncertain cash flows to certain cash flows.

**3. Sensitivity technique**

Where cash inflows are very sensitive under different circumstances, more than one forecast of the future cash inflows may be made. These inflows are regarded as "Optimistic", "Most Likely" and "Pessimistic." Cash inflows may be discounted to find out the net present values under these 3 different situations. If the net present values under the three situations differ widely it implies that there is a great risk in the project and the investor's decision to accept or reject a project will depend upon his risk bearing abilities.

**4. Probability technique**

A probability is the relative frequency with which an event may occur in the future. When future estimates of cash inflows have different probabilities the expected monetary values may be computed by multiplying cash inflows with the probability assigned. The monetary values of the inflows may further be discounted to find out the present values. The project that gives higher net present value may be accepted.

**5. Standard deviation method**

If two projects have the same cost and their net present values are also the same, standard deviations of the expected cash inflows of the two projects may be calculated to judge the comparative risk of the projects. The project having a higher standard deviation is said to be more risky as compared to the other.

**6. Coefficient of variation method**

Coefficient of variation is a relative measure of dispersion. If the projects have the same cost but different net present values, relative measure i.e., coefficient of variation should be computed to judge the relative position of risk involved. It can be calculated as

$$\text{Coefficient of variation} = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

**7. Decision tree analysis**

In modern business there are complex investment decisions which involve a sequence of decisions over time. Such sequential decisions can be handled by plotting decisions trees. A decision tree is a graphic representation of the relationship between a present decision and future events, future decisions and their consequences. The sequence of events is mapped out over time in a format resembling branches of a tree and hence the analysis is known as decision tree analysis.

## PROBLEMS ON CERTAINTY EQUIVALENT COEFFICIENT METHOD (CE)

**16. There are 2 projects X and Y each involves an investment of Rs. 40,000/-. The expected cash inflows and certainty coefficient's are as follows :**

**Project X**

| Year | Cash flows | Certainty factor |
|---|---|---|
| 1 | 25,000 | 0.8 |
| 2 | 20,000 | 0.7 |
| 3 | 20,000 | 0.9 |

**Project Y**

| Year | Cash flows | Certainty factor |
|---|---|---|
| 1 | 20,000 | 0.9 |
| 2 | 30,000 | 0.8 |
| 3 | 20,000 | 0.7 |

**If the cost of capital is 10% suggest which project should be accepted.**

*Sol :*

**Project X**

| Year | Cash in flows | C.F | Certain C.F | PV@10% | PV. CFAT |
|---|---|---|---|---|---|
| 1 | 25,000 | 0.8 | 20,000 | 0.909 | 18,180 |
| 2 | 20,000 | 0.7 | 14,000 | 0.826 | 11,564 |
| 3 | 20,000 | 0.9 | 18,000 | 0.751 | 13,518 |
| | | | | | 43,262 |

NPV = 43,262 – 40,000

$\therefore$ 3,262

**Project - Y**

| Year | Cash in flows | C.F | Certain C.F | PV@10% | PV. CFAT |
|---|---|---|---|---|---|
| 1 | 20,000 | 0.9 | 18,000 | 0.909 | 16,362 |
| 2 | 30,000 | 0.8 | 24,000 | 0.826 | 19,824 |
| 3 | 20,000 | 0.7 | 14,000 | 0.761 | 10,514 |
| | | | | | 46,700 |

NPV = 46,700 – 40,000 = 6,700

∴ The NPV is more in project Y when compared to project X. So accept project Y i.e., (6700 > 3262).

**17. Two mutually exclusive investment proposal are being considered the following information is available. The initial investment of both the project are 5,000/-**

**Project X**

| Year | Cash flows | CF |
|---|---|---|
| 1 | 4000 | 0.2 |
| 2 | 8000 | 0.4 |
| 3 | 12000 | 0.1 |
| 4 | 5000 | 0.2 |
| 5 | 4000 | 0.1 |

**Project Y**

| Year | Cash flows | CF |
|---|---|---|
| 1 | 8000 | 0.3 |
| 2 | 9000 | 0.1 |
| 3 | 9000 | 0.2 |
| 4 | 7000 | 0.2 |
| 5 | 6000 | 0.2 |

**If cost of capital is 12% suggest which project should be acceptable.**

*Sol :*

**Project X**

| Year | Cash in flows | C.F | Certain C.F | PV@12% | PV. CFAT |
|---|---|---|---|---|---|
| 1 | 4000 | 0.2 | 800 | 0.893 | 714.4 |
| 2 | 8000 | 0.4 | 3,200 | 0.797 | 2550.4 |
| 3 | 12,000 | 0.1 | 1,200 | 0.712 | 854.4 |
| 4 | 5,000 | 0.2 | 1,000 | 0.636 | 636 |
| 5 | 4,000 | 0.1 | 400 | 0.567 | 226.8 |
| | | | | | 4,982 |

NPV = 4982 – 5000 ∴ (18)

**Project Y**

| Year | Cash in flows | C.F | Certain C.F | PV@12% | PV. CFAT |
|---|---|---|---|---|---|
| 1 | 8,000 | 0.3 | 2,400 | 0.893 | 2,143.2 |
| 2 | 9,000 | 0.1 | 900 | 0.797 | 717.3 |
| 3 | 9,000 | 0.2 | 1,800 | 0.712 | 1,281.6 |
| 4 | 7,000 | 0.2 | 1,400 | 0.636 | 890.4 |
| 5 | 6,000 | 0.2 | 1,200 | 0.567 | 680.4 |
| | | | | | 5,712.9 |

NPV = 5712.9 – 5000

∴ 712.9

∴ The NPV is positive in project Y. So project Y is accepted.

## 2.7 Cost of Capital - Concept

**Q21. What is Cost of Capital?**

**(OR)**

**What do you understand by cost of capita ?**

*Ans :* **(May-19, Dec.-18, Sep.-14)**

**Meaning**

The cost of capital of a firm is the minimum rate of return expected by its investors. It is the weighted average cost of various sources of finance used by a firm. The capital used by a firm may be in the form of debt, preference capital, retained earnings and equity shares. The concept of cost of capital is very important in the financial management. A decision to invest in a particular project depends upon the cost of capital of the firm or the cut off rate which is the minimum rate of return expected by the investors.

In case a firm is not able to achieve even the cut off rate, the market value of its shares will fall. In fact, cost of capital is the minimum rate of return expected by its investors which will maintain the market value of shares at its present level. Hence, to achieve the objective of wealth maximisation, a firm must earn a rate of return more than its cost of capital. Further, optimal capital structure maximizes the value of a firm and hence the wealth of its owners and minimises the firm's cost of capital. The cost of capital of a firm or the minimum rate of return expected by its investors has a direct relation with the risk involved in the firm. Generally, higher the risk involved in a firm, higher is the cost of capital.

Cost of capital for a firm may be defined as the cost of obtaining funds, *i.e.,* the average rate of return that the investors in a firm would expect for supplying funds to the firm.

**Definitions**

i) **According to Hunt, William and Donaldson,** "Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due".

ii) **According to James C. Van Home** defines cost of capital as, "a cut-off rate for the allocation of capital to investments of projects. It is the rate of return on a project that will leave unchanged the market price of the stock."

iii) **According to Solomon Ezra,** "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditures."

iv) **According to Hampton, John J.** defines cost of capital as, "the rate of return the firm requires from investment in order to increase the value of the firm in the market place".

Thus, we can say that cost of capital is that minimum rate of return which a firm, must and, is expected to earn on its investments so as to maintain the market value of its shares.

From the definitions given above we can conclude three basic aspects of the concept of cost of capital:

i) Cost of capital is not a cost as such. In fact, it is the rate of return that a firm requires to earn from its projects.

ii) It is the minimum rate of return. Cost of capital of a firm is that minimum rate of return which will at least maintain the market value of the shares.

iii) It comprises of three components. As there is always some business and financial risk in investing funds in a firm, cost of capital comprises of three components :

   a) The expected normal rate of return at zero risk level, say the rate of interest allowed by banks;

   b) The premium for business risk ; and

   c) The premium for financial risk on account of pattern of capital structure.

Symbolically cost of capital may be represented as :

$$K = r_0 + b + f$$

where, K = Cost of capital

$r_0$ = Normal rate of return at zero risk level

b = Premium for business risk.

f = Premium for financial risk.

**Q22. Explain the Significance of cost of capital.**

**(OR)**

**What is the importance of cost of capital for an organization.**

*Ans :* **(May-19, March-16)**

The concept of cost of capital is a very important concept in financial management decision making. The concept, is however, a recent development and has relevance in almost every financial decision making but prior to that development, the problem was ignored or by-passed.

The progressive management always takes notice of the cost of capital while taking a financial decision. The concept is quite relevant in the following managerial decisions.

1. **Capital Budgeting Decision**

   Cost of capital may be used as the measuring road for adopting an investment proposal. The firm, naturally, will choose the project which gives a satisfactory return on investment which would in no case be less than the cost of capital incurred for its financing. In various methods of capital budgeting, cost of capital is the key factor in deciding the project out of various proposals pending before the management. It measures the financial performance and determines the acceptability of all investment opportunities.

2. **Designing the Corporate Financial Structure**

   The cost of capital is significant in designing the firm's capital structure. The cost of capital is influenced by the chances in capital structure. A capable financial executive always keeps an eye on capital market fluctuations and tries to achieve the sound and economical capital structure for the firm. He may try to substitute the various methods of finance in an attempt to minimise the cost of capital so as to increase the market price and the earning per share.

3. **Deciding about the Method of Financing**

   A capable financial executive must have knowledge of the fluctuations in the capital market and should analyse the rate of interest on loans and normal dividend rates in the market from time to time. Whenever company requires additional finance, he may have a better choice of the source of finance which bears the minimum cost of capital. Although cost of capital is an important factor in such decisions, but equally important are the considerations of relating control and of avoiding risk.

4. **Performance of Top Management**

   The cost of capital can be used to evaluate the financial performance of the top executives. Evaluation of the financial performance will involve a comparison of actual profitabilities of the projects and taken with the projected overall cost of capital and an appraisal of the actual cost incurred in raising the required funds.

5. **Other Areas**

   The concept of cost of capital is also important in many others areas of decision making, such as dividend decisions, working capital policy etc.

**Q23. Explain the different types of costs.**

*Ans :*

The classification of cost is given as follows:

1. **Future Cost vs. Historical Cost**

   Financial decisions are based on the future costs and not on the historical costs. The decisions relate to the future and hence the costs likely to be incurred in future are more significant than the costs which have already been incurred. Historical costs act simply as guides to estimate the future costs.

2. **Specific Cost vs. Composite Cost**

   The cost of individual source of capital is referred to as the specific cost and the cost of capital of all the sources combined is termed as composite cost or overall cost. It is thus the weighted cost of capital. The cost of debentures, preference shares, equity shares, retained earnings etc. is to be separately calculated first and then only the combined cost can be computed. Since the combined cost considers the quantum of financing through each source, the cost is known as the weighted cost.

**3. Average Cost vs. Marginal Cost**

Average cost of capital refers to the weighted average cost of capital calculated on the basis of cost of each source of capital and weights are assigned to the ratio of their share to total capital funds. Marginal cost of capital may be defined as the 'Cost of obtaining another rupee of new capital.'

When a firm rises additional capital from only one sources (not different sources), than marginal cost is the specific or explicit cost. Marginal cost is considered more important in capital budgeting and financing decisions. Marginal cost tends to increase proportionately as the amount of debt increase.

**4. Implicit Cost vs. Explicit Cost**

The implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be foregone if the projects presently under consideration by the firm were accepted. It is thus the opportunity cost.

For example, the implicit cost of retained earnings is the rate of return available to the shareholders had the funds been distributed to them. The explicit cost of any source of capital is the discount rate that equates the present value of the cash inflows that are incremental to the taking of the financial opportunity with present value of its incremental outflows.

**Q24. What are the differences between average cost of capital and marginal cost of capital?**

*Ans :*

| | Average Cost of Capital | Marginal Cost of Capital |
|---|---|---|
| 1. | ACC is the total average cost of capital to company which is calculated by taking into account the weights of all type of capital existed at a particular date in the capital structure of the company (Equity, Debt, bonds, debentures etc). | MCC is the incremental cost of capital which comes into existence when fresh capital is raised. It will depend on the type of capital raised, its weight and its cost. |
| 2. | Average cost of capital generally cannot be a component of marginal cost of capital. | Marginal cost of capital is a component of weighted average cost of capital. |

**Q25. What are the differences between explicit cost and implict cost?**

*Ans :*

| S.No. | Explicit Cost of Capital | Implicit Cost of Capital |
|---|---|---|
| 1. | Explicit cost involves immediate cash payments like, interest on loan. | Implicit costs do not involve any immediate cash payments. |
| 2. | Explicit costs are recorded in the books of accounts | Implicit costs are not recorded in the books of accounts. |
| 3. | Explicit costs are also known as out of pocket costs. | Implicit costs are known as economic costs. |
| 4. | Explicit cost are easily measured. | Implicit cost are not easily measured. |

**Q26. Explain the factors affecting cost of capital.**

*Ans :*

**1. General Economic Conditions**

General economic conditions determine the demand for and supply of capital with in the economy as well as the level of expected inflation. This economic variable is reflected in the risk less rate of return. This rate represents the rate of return on risk free investments such as the interest rate on short term, if the demand for money increases without an equivalent increase in the supply, lenders will raise their required interest rate. At the same time, if inflation is expected to deteriorate the purchasing power of the rupee, investors require a higher rate of return to compensate for this anticipated loss.

**2. Market Conditions**

If an investor is purchasing a security where the risk of the investment in significant, the opportunity for additional returns is necessary to make the investment attractive. Essentially, as risk increases, the investor requires a higher rate of return. This increase is called risk premium. If investors - increase their required rate of return this will simultaneously cause a higher cost of capital. If the security is not readily marketable when the investor wants to sell or even if a continuous demand for tine security exists but the price varies significantly, an investor will require a relatively high rate of return. On tne other hand, if a security is readily marketable and the price of the security is reasonably stable, the investor will have a lower required rate of return and the company's cost of capital will be lower.

**3. Firm's Operation and Financing Decisions**

Risks or the variability of return also results from decisions made within the company. Risk resulting from these decisions is generally divided into two types - Business risk and financial risk.

Business risk is the variability in returns on assets and is affected by the company's investment decisions.

Financial risk is the increased variability in returns to the common stock holders as a result of using debt and preferred stock.

As business risk and financial risk increase or decrease, the investor's required rate of return and the cost of capital will move in the same direction.

**4. Amount of Financing**

As the financing requirements of the firm become larger, the weighted cost of capital increases for several reasons. For instance, as more securities are issued, additional floatation cost (cost of selling securities) will affect the percentage cost of the funds to the firm. Also as management approaches the market for large amounts of capital relative to the firm's size, the investor's required rate of return may rise.

Suppliers of capital become hesitant to grant relatively large sums without evidence of management's capability to absorb this capital into the business. This concern is reflected in the proverbial "too much too soon" as the size of the issue increases, there is greater difficulty in placing it in the market without reducing the price of security, which also increases the firm cost of capital.

### 2.7.1 Measurement of Cost of Capital

**Q27. Explain various measures of cost of capital ?**

**(OR)**

**Discuss the techniques of calculating cost of capital of a firm.**

*Ans :* **(Dec.-18, July-18)**

The cost of capital is very important for making decisions. Cost of capital involves different costs related to different sources of finance, it is useful in making financial decisions. It is necessary for every firm to compute cost of capital before making decisions. The evaluation process of cost of capital involves two steps.

i) Calculation of different costs which are the sources of finance.

ii) The overall cost is calculated by combining different costs into a composite cost.

Hence it is essential to compute the' specific cost of each source to evaluate minimum obligation of a company i.e., composite cost of raising capital.

1. Cost of debt
2. Cost of preference capital
3. Cost of equity share capital
4. Cost of retained earnings.

### 2.7.1.1 Cost of debt

**Q28. Define cost of debt. How cost of debt is calculated.**

*Ans :* **(Dec.-18)**

The rate of interest which is paid on debt is termed as cost of debt. For calculation of the cost of debt following are required - net proceeds of debenture, amount of interest paid periodically and the principal quality of debt. The cost of debt before tax is calculated from following formula,

$$K_{dh} = \frac{1}{P}$$

Where,

$K_{dh}$ = Before tax cost of debt

I = Interest

P = Principal.

When firm raises debt at premium or discount, then P is not the face value of securities but it is the amount of net proceeds received from the issue. In this case the formula will be,

$$K_{dh} = \frac{1}{NP}$$

Where, NP = Net proceeds.

When firm raises capital from debt a sufficient amount of tax is saved because interest is treated as a deductible expense in calculation of tax. Hence it reduces cost of debt. The cost of debt after tax is calculated as,

$$K_{dh} = K_{dh}(1-t) = \frac{1}{NP}(1-t)$$

Where,

$K_{dh}$ = After tax cost of debt

t = Rate of tax.

**Cost of Redeemable Debt**

The debt which is issued to be redeemed after specific period of time is known as redeemable debt. The cost of redeemable debt capital is calculated as,

The cost of redeemable debt before tax is calculated as,

$$K_{dh} = \frac{1 + \frac{1}{n}(RV - NP)}{\frac{1}{2}(RV + NP)}$$

Where,

I = Annual interest

n = Number of years in which debt is to be redeemed

RV = Redeemable value of debt

NP = net proceeds of debentures.

The cost of redeemable debt after tax is calculated as,

$$K_{dh} = \frac{1(1-t) + \frac{1}{n}(RV - NP)}{\frac{1}{2}(RV + NP)}$$

Where,

I = Annual interest t - Tax rate

n = Number of years in which debt is to be redeemed

RV = Redeemable value of debt

NP = Net proceeds of debentures.

### 2.7.1.2 Cost of equity preference shares

**Q29. How is cost preference capital calculated?**

*Ans :* **(Dec.-18)**

Preference shares are the fixed cost bearing securities. In case of preference shares, the rate of dividend is fixed in advance at the time of the issue.

Preference shareholders have a preferential rights unlike equity shareholders with regard to payment of dividend and return of principal amount. Preference dividend is paid from after tax profits, so adjustments are not made in tax at the time of calculating cost of preference shares. Preference dividend is considered as an appropriation of profits and not as a charge on profits.

There are two types of preference capital,

a) Irredeemable preference capital

b) Redeemable preference capital,

**a) Irredeemable Preference Capital**

Irredeemable preference capital involves perpetual payment of dividend to preference shareholders at a prescribed rate.

$$K_p = \frac{D_p}{P}$$

K = Cost of preference capital

D = Annual preference dividend

$P$ = Net proceeds of preference share capital.

[or]

$$K_p = \frac{D_p}{N_p}$$

[When preference shares are issued at a premium or discount]

**b) Redeemable Preference Capital**

Redeemable preference shares are those which can be redeemed or recovered on maturity of issue or after specific period of time.

$$K_p = \frac{D_p + \frac{(P_n - P}{n}}{\frac{(P_n + P)}{2}} \text{ or}$$

$$P = \sum_{i=1}^{x} \frac{D_{pi}}{(1+K_p)} + ... + \frac{P_n}{(1+K_p)^x}$$

Where,

K = Cost of preference capital

D = Annual preference dividend

$P$ = Net proceeds of preference share capital.

$D_p$ = Annual preference dividend

$P_n$ = Amount payable at time of redemption

$n$ = Redemption period of preference shares.

### 2.7.1.3 Cost of Equity Share Capital

**Q30. How is cost of equity share capital calculated ?**

*Ans :* **(May-19, Dec.-18)**

The cost of equity capital is the return which is expected by its investors. In order to provide expected returns to the equity shareholders, company must earn minimum rate of return which is necessary to have a constant market price of the shares. The expectations of the shareholders must be considered before issuing new equity shares for raising additional capital.

The calculation of cost of equity shares is a complicated process because interest or dividend is not paid on fixed rate and also there is no legal commitment to pay dividend to equity shareholders. Hence market value of shares depends on the amount of dividend paid and the rate of dividend depends on the degree of business and financial risk. Following are the approaches or methods through which cost of equity shares can be computed,

a) Dividend yield method or dividend/price ratio method

b) Dividend yield with annual growth rate

c) Earning yield method

d) CAPM approach (Capital Asset Pricing Model)

e) Bond yield with risk premium

f) Realized yield method.

**a) Dividend Yield Method or Dividend/ Price Ratio Method**

In this method, the cost of equity capital is considered as a discount rate at which current value of expected future dividends per share is equal to net proceeds or market price of a share. In this approach the cost of equity shares will be,

$$K_e = \frac{D}{NP} \times 100 \text{ or } \frac{D}{MP} \times 100$$

Where,

$K$ = Cost of equity capital

$D$ = Expected dividend per share

$NP$ = Net proceeds per share

$MP$ = Market price per share.

Dividend yield method involves some assumptions,

i) It does not consider any growth in dividend

ii) Capital gains and retained earnings are also not considered.

This method is applicable to the companies which have constant profits and constant dividend policy throughout the period of time.

**b) Dividend Yield with Annual Growth Rate**

The dividend yield with annual growth rate method is used in the situation where dividend-pay-out ratio remains constant and dividends are expected to grow at a constant rate in the firm, then this method is suitable to calculate cost of equity capital. In this method, dividends are the growth rate form the basis for the cost of equity capital.

$$K_e = \frac{D_1}{NP} + G = \frac{D_0(1+g)}{NP} + G$$

Where,

$K_e$ = Cost of equity capital

$D_1$ = Expected dividend per share at the end of the year

$NP$ = Net proceeds per share

$G$ = Rate of growth in dividend

$D_0$ = Previous year's dividend.

When cost of existing equity share capital is calculated, then net must be replaced with market price.

$$K_e = \frac{D_1}{MP} + G$$

**c) Earning Yield Method**

In this method, the cost of equity capital is considered as the discount rate at which the current value of expected future EPS (earnings per share) is equal to the prevailing market price or net proceeds of the shares. In this method the cost of equity capital is,

$$K_e \frac{\text{Earnings per share}}{\text{Net proceeds}} = \frac{EPS}{NP}$$

When, cost of existing equity capital is calculated.

The earning yield method is applicable in following situations for calculating cost of equity capital,

i) When it-is expected that earnings per share remains constant.

ii) In times when the dividend pay out ratio is 100% or retention ratio is zero, i.e., when firm distributes all its profits as dividends.

iii) When market price of the share is effected only by the earnings per share.

iv) When firm expects that earnings on new equity shares capital is equal to present rate of earnings.

**d) Capital Asset Pricing Model : [CAPM] Approach**

The cost of equity is also calculated with the help of CAPM model. It separates the cost of equity into risk-free return which is available for investing in government bonds and an additional risk premium which is for investing in a specific share or investment. The risk premium involves the average return on the overall market portfolio and the beta factor i.e., the risk factor of the particular investment. The cost of equality for an investment with the help of CAPM approach is calculated as follows,

$$K_e = R_f + b_i(R_m - R_f)$$

Where,

$K_e$ = Cost of equity

$R_f$ = Risk free rate of return

$b_i$ = Beta of the investment

$R_m$ = Average market return.

**e) Bond Yield with Risk Premium Approach**

According to bond yield with risk premium approach, the required rate of return of the equity shareholders of a firm is equal to the returns on long term bonds and risk premium.

$K_e$ = Return on long term bonds + Risk premium

This approach explains that risk of equity investors is much greater than risk of bond investors. Hence required rate of return of the equity investor involves premium for higher risk. There is no theoretical basis to calculate the risk premium.

**f) Realized Yield Method**

The problem of evaluating the expectations of the investors relating to future dividends and earnings can be solved with the help of realized yield method. It is difficult to calculate accurate future dividends and earnings because they are dependent on many uncertain factors. Hence the realized yield method is suitable, which considers the actual average rate of return realized in the past to calculate the cost of equity share capital. In order to calculate the average rate of return realized, the dividend received in the past and the gain realized at the time of sale of shares must be taken into consideration. The realized yield method involves following assumptions,

a) The firm will have constant risk for a specific period of time.

b) The expectations of the shareholders are dependent on past realized yield.

c) Investors assume that they get same rate of return as the realized yield even if they invest somewhere else.

d) It is assumed that there are no remarkable changes in market price of shares.

### 2.7.1.4 Cost of Retained Earnings

**Q31. How do you measures Cost of Retained Earnings ?**

**(OR)**

**Discuss the approach to determine the cost of Retained Earnings**

*Ans :* **(Dec.-19, March-15)**

As firms do not pay any dividends on retained earnings, hence no cost is involved in retained earnings.

The cost of retained earnings can be evaluated as rate of return acquired by the shareholders from an alternative by investing after-tax dividends. It is similar to the opportunity cost of dividends which is scarified by the shareholders.

The cost of retained earnings can be calculated as follows,

$$k_r = \frac{D_1}{MP} + G$$

Where,

$K_r$ = Cost of retained earnings

$D_1$ = Expected dividend

MP = Market price per share

G = Growth rate.

Inspite of 100% payout ratio, shareholders are unable to get whole amount of retained earnings in the form of dividends. Shareholders need to pay tax on dividend income. Some alternative way is to be made with regard to tax, following formula is useful,

$$K_r = \left[\frac{D}{NP} + G\right] \times (1 - t) \times (1 - b)$$

$$K_r = k_e(1 - t)(1 - b)$$

Where,

$K_r$ = Cost of retained earnings

D = Expected dividend

G = Growth rate

NP = Net proceeds of equity issue

t = Tax rate

b = Cost of purchasing new securities

$k_e$ = Rate of return available to shareholders.

### 2.7.2 Debt vs. Equity

**Q32. Compare and contrast Debt vs. Equity.**

**(OR)**

**What are the differences between Debt vs. Equity.**

*Ans :*

| Debt | Equity |
|---|---|
| 1. Debt refers to a sum of money that is lent to another party on the repayment of principal amount of a loan. | 1. Equity refers to the net value of ordinary shares and preference shares. |
| 2. In debt, investment risk is less for both investors and creditors. | 2. In equity, investment risk is high for both investors and creditors. |
| 3. Cash receipts are fixed. | 3. Cash receipts are variable. |
| 4. Debts management involves the provision for contractual future cash payments and holds an impact on credit ratings of a firm. | 4. Equity has discretionary dividends and is effected by dilution/takeover. |
| 5. Debts have tax-deductible interest. | 5. In equity, tax is not deductible from dividends. |
| 6. It acts as a liability in the balance sheet. | 6. It acts as an asset under a name and shareholder's equity of balance sheet. |
| 7. Transactions related to debt effects the income statement. | 7. Transactions related to the equity does not effect the income statement. |
| 8. In debts, maturity date and time needs to be clearly specified. | 8. In equity, no specific maturity date and time is stated. |
| 9. Lenders have limited voting rights. | 9. Equity holders have voting rights apart from other managerial rights. |

## PROBLEMS ON COST OF CAPITAL

**18. A company has 15% perfectual Debt of Rs.100,000. The Tax rate is 35%. Determined cost of capital (Before tax and After tax) assuming Debt is issued**

**1. at par**

**2. at 10% discount**

**3. at 10% premium**

*Sol :*

**1. at par**

**(a) Before Tax**

$$Kd = \frac{I}{P-f} \times 100$$

I = Interest = $\left[\text{Face value} \times \frac{\text{Rate}}{100}\right]$

$= 100{,}000 \times \frac{15}{100} = 15{,}000$

P = Issue price $\rightarrow$ At par $\rightarrow$ P = FV

$\therefore$ P = 100,000

t = Tax Rate = 35% (or) 0.35

f = Flotation cost = NIL

$$\therefore \text{Kd} = \frac{15000}{100{,}000 - NIL} \times 100$$

$$= \frac{15000}{100{,}000} \times 100$$

$\therefore$ Kd = 15%

**(b) After Tax**

$$\text{Kd} = \frac{(1-t)I}{p-f} \times 100$$

$$= \frac{(1-0.35)15000}{100{,}000 - NIL} \times 100$$

$$= \frac{9{,}750}{100{,}000} \times 100$$

$\therefore$ Kd = 9.75%.

**2. Issue at 10% Discount**

**(a) Before Tax**

$$\text{Kd} = \frac{I}{p-f} \times 100$$

P = Issue Price $\rightarrow$ face value – Discount

$$\text{Kd} = \frac{15000}{90{,}000 - NIL} \times 100 \quad 100{,}000 - 10{,}000$$

(100, 000 $\times$ 10%)

$\therefore$ Kd = 16.67%

$\therefore$ P = 90,000

**(b) After Tax**

$$\text{Kd} = \frac{(1-t)I}{p-f} \times 100$$

$$\text{Kd} = \frac{(1-0.35)1500}{90{,}000 - Nil} \times 100$$

$$\text{Kd} = \frac{9{,}750}{90{,}000} \times 100$$

$\therefore$ Kd = 10.83%.

**3. Issue At premium**

**(a) Before Tax**

$$\text{Kd} = \frac{I}{p-f} \times 100$$

P = Face value + Premium

$$\text{Kd} = \frac{15000}{110{,}000 - NIL} \times 100$$

$$P = 100{,}000 + 10{,}000 \left(100{,}000 \times \frac{10}{100}\right)$$

$$\text{Kd} = \frac{15000}{110{,}000} \times 100$$

$\therefore$ P = 110,000

$\therefore$ Kd = 13.64%

**(b) After Tax**

$$\text{Kd} = \frac{(1-t)I}{p-f} \times 100$$

P = Issue Price

$$\text{Kd} = \frac{(1-0.35)1500}{110{,}000 - Nil} \times 100$$

Face value + Premium

100,000 + 10,000

$$\text{Kd} = \frac{9750}{110{,}000} \times 100$$

$\therefore$ p = 110,000

$\therefore$ Kd = 8.86%.

**19. A company issued 10,000 debentures at Rs.100/- each estimated floatation cost 5% on issue value. Tax rate is 50%. Calculate cost of Debt rate of interest is 8%.**

**(a) If Issue at par**

**(b) If issued at discount at 10%**

**(c) If issued with premium at 20%**

*Sol :*

**Calculation of Cost of Debenture**

**a) Issue at par**

$$Kd = \frac{(1-t)I}{p-f} \times 100$$

$$I = \text{Interest} = \text{Face Value} \times \frac{Rate}{100}$$

$$= 100 \times \frac{8}{100} = \text{Rs.8/-}$$

$P$ = Issue price = at par = 100

f = flotation cost

$$= 100 \times \frac{5}{100} = \text{Rs.5}$$

$$Kd = \frac{(1-0.5)8}{100-5} \times 100$$

$$Kd = \frac{4}{95} \times 100$$

$\therefore$ Kd = 4.21%.

**b) Issued at discount at 10%**

$$Kd = \frac{(1-t)I}{p-f} \times 100$$

$I$ = Interest

$$= 8\left(\text{Face Value} \times \frac{\text{Rate}}{100}\right)$$

$P$ = Issue Price at discount

$$100 \times \frac{90}{100} = \text{Rs .90}$$

$$f = \text{Issue Price} = P \times \frac{Rate}{100} = 90 \times \frac{5}{100}$$

= 4.5

$$\therefore \quad Kd = \frac{(1-0.5)8}{90-4.5} \times 100$$

$$Kd = \frac{(1-0.5)8}{85.5} \times 100$$

$$\therefore \quad Kd = \frac{4}{85.5} \times 100$$

Kd = 4.68%

**c) Issued at premium at 20%**

$$Kd = \frac{(1-t)I}{p-f} \times 100$$

$$I = \text{Interest} = \text{Rs.8} \left(Face\ Value \times \frac{Rate}{100}\right)$$

P = Issue price at premium

= 100 × 120% = 120

$$f = \text{Flotation cost} = P \times \frac{Rate}{100}$$

$$= 120 \times \frac{5}{100} = 6$$

$$Kd = \frac{(1-0.5)8}{120-6} \times 100$$

$$= \frac{4}{114} \times 100 \quad \therefore Kd = 3.51\%$$

**20. A company issued 1000, 10% debentures of Rs. 100/- each these debentures will redeemable after 7 years. Corporate tax rate is 35% calculate cost of debt.**

**Under the following situation.**

1. **If redeemable at par flotation cost is 5%**
2. **If redeemable at premium of 5% with no flotation cost.**
3. **If issued at discount at 10%, flotation cost 2%, and redeemable at 5% Premium.**
4. **Issued at premium of 10%, flotation cost 2%, and the redemble value is 10% premium.**

*Sol :*

**1. If Redemble at Par**

$$Kd = \frac{(1-t)I + \frac{1}{n}[(R-p)+f]}{\frac{R+p-f}{2}} \times 100$$

$t$ = Tax Rate = 0.35

$$I = FV \times \frac{Rate}{100}$$

$$= 100 \times \frac{10}{100} = \text{Rs.10/-}$$

$P$ = Issue value = at par = Rs. 100

$R$ = Redemble value = at par = Rs.100

$F$ = Flotation cost

$$= P \times \frac{Rate}{100} = 100 \times \frac{5}{100} = \text{Rs.5/-}$$

$n$ = Number of years (or) maturity period = 7 years

$$Kd = \frac{(1-0.35)10 + \frac{1}{7}[(100-100)+5]}{\frac{100+100-5}{2}} \times 100$$

$$Kd = \frac{6.5 + \frac{1}{7}(5)}{\frac{200-5}{2}} \times 100 = \frac{6.5+0.714}{\frac{195}{2}} \times 100$$

$$= \frac{7.214}{97.5} \times 100$$

$\therefore$ Kd = 7.40%.

**2. If redemble at Premium of 5% with no flotation cost.**

$$Kd = \frac{(1-t)I + \frac{1}{n}(R-P+f)}{\frac{R+P-f}{2}} \times 100$$

t = Tax Rate = 0.35

$$I = FV \times \frac{Rate}{100} \quad 100 \times \frac{10}{100} = \text{Rs.10}$$

P = Face Value $\rightarrow$ at par

= Rs.100

R = Redeemable value $\rightarrow$ at premium i.e, FV + premium 100 + 5 = 105

f = Flotation cost = NIL

n = Maturity period = 7 years

$$Kd = \frac{(1-0.35)10 + \frac{1}{7}(105-100)+0}{\frac{105+100-0}{2}} \times 100$$

$$Kd = \frac{(0.65)10 + \frac{1}{7}(5)}{\frac{205}{2}} \times 100$$

$$Kd = \frac{6.5+0.714}{102.5} \times 100$$

$$Kd = \frac{7.214}{102.5} \times 100$$

$\therefore$ Kd = 7.04%.

**3. If Issued at discount of 10%, flotation cost at 2%, and redeemable at 5% premium.**

$$Kd = \frac{(1-t)I + \frac{1}{n}[R-P+f]}{\frac{R+p-f}{2}} \times 100$$

$$I = \text{Interest} = FV \times \frac{Rate}{100}$$

$$= 100 \times \frac{10}{100} = \text{Rs.10}$$

P = Issue Price - at discount

= i.e. FV – discount 100 – 10 = Rs. 90

R = Redemble value $\rightarrow$ at premium i.e

= FV + premium 100 + 5

$\therefore$ R = 105

$$F = \text{Flotation cost} = P \times \frac{Rate}{100}$$

$$90 \times \frac{2}{100} = 1.8$$

n = Maturity period = 7 years

Kd = $$\frac{(1-0.35)10+\frac{1}{7}[(105-90)+1.8]}{\frac{105+90-1.8}{2}}\times 100$$

Kd = $$\frac{(0.65)10+\frac{1}{7}[(105-90)+1.8]}{\frac{105+90-1.8}{2}}\times 100$$

Kd = $$\frac{6.5+\frac{1}{7}(16.8)}{\frac{193.2}{2}}\times 100$$

Kd = $$\frac{6.5+2.40}{96.6}\times 100$$

Kd = $$\frac{8.90}{96.6}\times 100$$

Kd = 9.21 %.

**4. Issued at premium of 10% flotation cost 2% and the redeemable value is 10% premium.**

Kd = $$\frac{(1-t)I+\frac{1}{n}[(R-P)+f]}{\frac{R+P-f}{2}}\times 100$$

T = tax rate = 0.35

I = Interest = FV $\times \frac{Rate}{100}$

= $100\times\frac{10}{100}$ = Rs 10/-

n = Maturity period = 7 years

R = Redeemable value

i.e = FV + Premium 100 + 10 = Rs. 110

P = Face value + premium 100 + 10

= 110

f = flotation cost

= $P\times\frac{Rate}{100}$ 100 $\times$ $2/100$ $\Rightarrow$ 2.23

Kd = $$\frac{(1-0.35)10+\frac{1}{7}[(110-110)+2.2]}{\frac{110+110-2.2}{2}}\times 100$$

Kd = $$\frac{(0.65)10+\frac{1}{7}(2.2)}{\frac{110+110-2.2}{2}}\times 100$$

Kd = $$\frac{6.5+0.314}{\frac{220-2.2}{2}}\times 100$$

Kd = $$\frac{6.5+0.314}{\frac{217.8}{2}}\times 100$$

Kd = $$\frac{6.814}{108.9}\times 100$$

Kd = 6.26%.

**21. ABC Ltd. has issued 14% pref. shares of the face value of Rs.100 each to be reedeembed after 10 years. Flotation cost is expected to be 5% determined cost of preference shares.**

*Sol :*

Kp = $$\frac{Dp+\frac{1}{n}(R-P+f)}{\frac{R+P-f}{2}}\times 100$$

Kp = Cost of Preference

Dp = Preference Dividend

P = Issue Price = Rs. 100

Face value $\times$ $14/100$ = Rs. 14

n = Maturity period = 10 Yrs.

flotation cost = P $\times$ $Rate/100$

= 100 $\times$ $5/100$ = Rs. 5/-

R = Redeemable cost = Rs. 100

$$Kp = \frac{Dp + \frac{1}{n}\left(\left(R-P\right)+f\right)}{\frac{R+P-f}{2}} \times 100$$

$$= \frac{14 + \frac{1}{10}\left(\left(100-100\right)+5\right)}{\frac{100+100-5}{2}} \times 100$$

$$Kp = \frac{14 + \frac{1}{10}(5)}{\frac{200-5}{2}} \times 100$$

$$= \frac{14+0.5}{195/2} \times 100$$

$$Kp = \frac{14.5}{97.5} \times 100 = 14.87$$

**22. A company raised preference share capital of Rs.10,00,000 by the issue of 10% preference share of Rs.10 each. Find out the cost of preference share capital when it is issued at (i) 10% premium, and (ii) 10% discount.**

*Sol :* **(July-18)**

Given,

Preference share capital = Rs. 10,00,000

Rate of dividend = 10%

Face value = Rs. 10

cost of preference share capital is calculated by using the following formula

$$\boxed{k_p = \frac{D_P}{NP}}$$

$$D_P = \text{fixed preference dividend} = \left(10{,}00{,}000 \times \frac{10}{100}\right) = 1{,}00{,}000$$

N = Net proceed of preference share

**(i) When preference share are issued @ 10% premium**

$$k_p = \left(\frac{D_P}{N_P}\right)$$

$$\text{Here } N_P = \text{face value + premium} = 10,\ 00{,}000 + \left(\frac{10}{100} \times \text{F.V}\right)$$

$$= 10{,}00{,}000 + \left[\frac{10}{100} \times 10{,}00{,}000\right] = \text{Rs. } 11{,}00{,}000$$

$$\therefore \quad k_p = \frac{1{,}00{,}000}{11{,}00{,}000} \times 100 = \frac{100}{11} = 9.09\%$$

**(ii) When preference share are assumed @ 10% discount**

$$k_p = \left(\frac{D_P}{N_P}\right)$$

Here $N_p$ = face value – discount

$$= 10,00,000 - \left(\frac{10}{100} \times 10,00,000\right)$$

$$= 10,00,000 - 1,00,000$$

$$= 9,00,000 \text{ Rs.}$$

$$\therefore \quad k_p = \frac{1,00,000}{9,00,000} \times = 11.11\%$$

**23. The entire share capital of a company consist of 1,00,000 equity share of Rs. 100 each. Its current earnings are Rs.10,00,000 p.a. The company wants to raise additional funds of Rs.25,00,000 by issuing new shares. The flotation cost is expected to be 10% of the face value. Find out the cost of equity capital given that the earnings are expected to remain same for coming years.**

*Sol :* **(July-18)**

Given,

Equity share capital = 1,00,000 equity shares

Face value = Rs. 100 each

current earning = Rs. 10,00,000 p.a

Additional capital = Rs. 25,00,000 by issue new shares

Flotation cost = 10% of face value

**Calculation of Net Process**

Equity share capital (1,00,000 @ 100) 100,00,000

**Less :**

Flotation cost

| | |
|---|---|
| $\left(100,00,000 \times \frac{10}{100} = 10,00,000\right)$ | 10,00,000 |
| Net Proceeds | 90,00,000 |

$\therefore$ Net Proceeds = ` 90,00,000

Earnings = ` 10,00,000

$$\therefore \quad K_e = \frac{E}{NP} = \frac{10,00,000}{90,00,000} \times 100 = 11.11\%$$

**24. A company issues 10% Debentures for Rs.2,00,000 Rate of tax is 40%. Calculate the cost of debt (after tax) if the debentures are issued (a) at par (b) at a discount of 10% and (c) at a premium of 10%.**

*Sol :* **(July-18)**

Given,

Issue of 10% debenture = Rs. 2,00,000

Rate of tax = 40%

**(i) when issued @ par**

**Formula**

$$k_d = \frac{I}{NP}(1 - T)$$

Here I = Manual interest payment = $2,00,000 \times \frac{10}{100}$ = Rs. 20,000 p.a

NP = Net proceeds = Rs. 2,00,000

$$\therefore \; k_d = \frac{I}{NP} \times (IT) = \frac{20,000}{2,00,000} \times (1 - 0.40) = 0.06 = 6\%$$

**(ii) when issued @ 10% discount**

$$k_d = \frac{I}{NP}(1 - T)$$

Here I = Interest p.a = Rs. 20,000 p.a

$$NP = \text{Face value} - \left(\text{Face value} \times \frac{10}{100}\right)$$

$$= 2,00,000 - \left(2,00,000 \times \frac{10}{100}\right)$$

= 2,00,000 – 20,000

= 1,80,000 Rs.

$$\therefore \; k_d = \frac{20,000}{1,80,000} \times (1 - 0.40) = 0.0666 \approx 6.6\%$$

**(iii) when issued @ 10% premium**

$$k_d = \frac{I}{NP} \times (1 - T)$$

Here I = Interest p.a = Rs. 20,000 p.a

$$NP = \text{Face value} + \left(\text{Face value} \times \frac{10}{100}\right)$$

$$= 2,00,000 + \left(2,00,000 \times \frac{10}{100}\right)$$

= 2,00,000 + 20,000

= Rs. 2,20,000

$$\therefore k_d = \frac{20,000}{2,20,000} \times (1 - 0.40)$$

$= 0.0545$

$= 5.45\%$

**25. Z ltd, is forecasting a growth rate of 12 percent per annum in the next 2 years. The growth rate is likely to fall to 10 percent for the third year and the fourth year. After that, the growth rate is expected to stabilize at 8 percent per annum. If the last dividend was Rs. 1.50 per share and the investor's required rate of return is 16 percent, find out the intrinsic value per share of Z ltd as of data.**

*Sol :* **(Dec.-19)**

**PV factors @ 16% for 5 years**

| **Years** | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **Discount @16%** | 1 | 0.862 | 0.743 | 0.642 | 0.552 | 0.475 |

**PV of Dividend stream for first 2 years**

Rs. $1.50\ (1.12) \times 0.862 + 1.50 \times (1.12)^2 \times 0.743$

Rs. $1.68 \times 0.862 + 1.50 \times 1.2544 \times 0.743$

Rs. $1.448 + 1.398 = 2.846$ ... (A)

**PV of Dividend Shares for Next 2 Years**

Rs. $1.881\ (1.10) \times 0.642 + 1.881\ (1.10)^2 \times 0.552$

Rs. $2.069 \times 0.642 + 2.276 \times 0.552$

Rs. $1.328 + 1.256 = 2.584$ .... (B)

Market value of equity shares at the end of 4th year calculated by using the constant dividend growth model would be.

$P4 = \frac{D5}{k_S - g_n}$ } Where D5 = Dividend in 5th year, $g_n$ = Growth rate, $k_s$ = required rate of return.

Now $D5 = D4(1 + g_n)$ $\therefore$ $D5 = 2.276 \times (1 + 0.08)$.

D5 = 2.458

P4 = ` 2.458 / (.12 – 0.10) = 2.458 /.02

= `122.9

Present Market value of $P_4$ = 122.9 × 0.552 = ` 67,840 .... (C)

$\therefore$ Intrinsic value per share of Z Ltd would be

A + B + C = ` 2,846 + 2.584 + 67.840 = ` 73.27.

## 2.8 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

**Q33. Discuss about Weighted Average Cost of Capital.**

**(OR)**

**What is weighted average cost of capital?**

*Ans :* **(Dec.-19, Feb.-17, March-15)**

The average cost of the costs of several means of financing, is known as weighted average cost of capital. It can also be termed as overall cost of capital, composite cost of capital or average cost of capital.

Weighted average cost of capital can be easily evaluated, if cost of a particular source of finance is evaluated.

WACC can be computed as follows,

$$WACC = w_e k_e + w_d k_d + w_p k_p$$

Where,

$w_e$ = Proportion of equity capital

$w_d$ = Proportion of debt capital

$w_p$ = Proportion of preference capital

$k_e$ = Cost of equity capital

$k_d$ = Cost of debt after tax

$k_p$ = Cost of preference capital.

Following steps are involved in evaluation process of weighted average cost of capital :

- Assigning weights to individual costs.
- Multiplying the cost of each of the sources by the appropriate weights.
- Dividing the total weighted cost by the total weights.

Alternatively, weighted average cost of capital can be assessed as follows,

$$k_w = \frac{\Sigma XN}{\Sigma W}$$

Where,

$k_W$ = Weighted average cost of capital

X = Cost of individual source of finance

W = Weight, proportion of specific source of finance.

**Assignment of Weights**

The weights used in evaluation of overall cost of capital are,

(a) Marginal weights method and

(b) Historical weights method

### (a) Marginal Weights Method

In case of this method, weights are assigned to each source of funds, in proportions of financing inputs that the firm aims to raise. The method is based on capital and not with capital raised in the past. In case, the weights are applied in a ratio different from the ratio in which the new capital is to be raised, the WACC calculated may be different from the actual cost of capital. This may lead to wrong capital investment decisions.

The marginal weighting system consists some weak points. One of the major drawback in usage of marginal weights is that it does not evaluate the long-term results of current financing of the firm. A firm must give due attention to long-term implications while designing the firm's financing strategy.

**Example**

A firm may accept a project giving an after-tax return of 6% because it intends to raise the funds required by issue of debentures having an after-tax cost of 5%. In case next year, the firm intends to raise funds by issue of equity shares having a cost of 9%, it will have to reject the project which gives a return of only 8%. Thus, marginal weighting method does not consider the fact that today's financing tomorrow's cost.

### (b) Historical Weights Method

Several sources of the prevailing capital structure are taken in comparative proportion to assign weights in historical weights method. This method is based on the funds which were already raised by the firm. The application of historical weights is based on belief that prevailing capital structure of the firm is optimal and it must be continued in future also. Weights under historical system will be either book value weights or market value weights. Book values are operationally suitable and market values are based on theoretical consistency.

Use of historical weights suffer from some practical difficulties and also include the problem of choice between book value and market value weights.

**Q34. State the merits and demerits of weighted average cost of capital.**

*Ans :*

**Merits**

1. In case of determination of future project profitability, WACC is treated as cut off rate.
2. If firm earn more percentage of profit than WACC, therefore the market value of the firm will increased. Profit taken or not decision is depending on this point. A project considered valuable only if the return from it is higher than WACC.
3. Business unit used different source of finance and invested in the project. So individual cost of capital is not enough for project selection process. Therefore overall cost of capital is considered for project selection process.
4. WACC is widely used to selection project among the option available.
5. WACC is useful in making Economic value Added (EVA) calculation.
6. WACC indicate the minimum rate of return at which business unit create the investors value. If return on capital employed (ROCE) is higher than WACC, business unit will create the investors value, otherwise business unit will fail to create the investors Value.

**Demerits**

1. **Determining the Weights**

   The first & foremost difficulty in computing the average cost is to assign weights to different components of capital structure.

2. **Choice of Capital Structure**

   The choice of capital structure is to be used for determining the average is not an easy job. These types of capital structure are these, i.e., current capital structure, marginal capital structure or optimum capital structure. Generally current capital structure is regarded as the optimum capital structure but it is not always correct.

3. **Other Limitations**

   (i) Average cost of capital can't be used in following circumstances

   (a) When the company is trying to bring about radical changes in its debt policy.

   (b) When the dividend policy of the company is being changed.

   (c) When the growth objective of the company are being changed.

   (d) When there is a change in capital structure involving a change in debt equity mix.

   (ii) It is presumed that the cost of raising funds is in dependent to the value funds raised. The presumption does not hold well in practices.

   (iii) The specific costs are based upon the existing capital structure and these will change when additional funds have been raised. A firm cannot measure its cost directly on additional capital, it can only be estimated. If additional financing capital structure changes the effective rate of capital will also change.

### 2.8.1 Marginal Cost of Capital (MCC)

**Q35. What is Marginal Cost of Capital (MCC)?**

**(OR)**

**What is meant by marginal cost of capital ?**

*Ans :* **(Dec.-19, Aug.-17, Aug.-15)**

The incremental cost incurred by the company for raising additional funds is known as marginal cost. The marginal cost is an important concept in taking decisions relating to financial matters. When marginal weights are used in calculation of weighted average cost of new capital then it is called as marginal cost of capital. The marginal weights imply the amount of different sources of funds utilized in raising additional funds. The marginal weights are also termed as firm's target capital structure which the firm tries to continue in long run.

1. WMCC refers to the cost of raising additional new funds whereas WACC is the cost of raising total new funds in an accounting period.

2. When firm utilize its prevailing capital structure and component costs are same, then WMCC is equal to WACC.

3. When firm raise additional funds then component costs change, hence WMCC is not equal to WACC.

4. WMCC does not consider the impact of new financing plans in long run, so WACC is used for maximizing shareholder's wealth in long-run.

## PROBLEMS ON WEIGHTED AVERAGE COST OF CAPITAL

**26. Your given the capital structure of XY company calculate weight average cost of capital**

| Source of fund | Amount | Cost |
|---|---|---|
| **Equity share capital** | **4,00,000** | **14%** |
| **Retained Earnings** | **2,00,000** | **13%** |
| **Preference capital** | **1,00,000** | **12%** |
| **Debt** | **3,00,000** | **9%** |
| **Cost of Capital** | **10,00,000** | |

*Sol :*

A Statement showing weighted

| Sources of Fund | Amount | Proportion | Cost of Capital (3 × 4) | WACC (3 × 4) |
|---|---|---|---|---|
| Equity | 4,00,000 | 0.414 | 14% | 5.6 |
| Retained earnings | 2,00,000 | 0.213 | 13% | 2.6 |
| Preference capital | 1,00,000 | 0.112 | 1.2% | 1.2 |
| Debt. | 3,00,000 | 0.39 | 9% | 2.7 |
| Cost of Capital | 10,00,000 | | 12.10 | 12.10 |

Weighted average cost of capital = 12.10

**27. The following is the capital structure of "X" limited Co.,**

| Particulars | Book Value | Market Value |
|---|---|---|
| **Debentures** | **300,000** | **300,000** |
| **Preference capital** | **200,000** | **200,000** |
| **Equity share capital** | **400,000** | **700,000** |
| **Retained earnings** | **100,000** | **–** |

**After tax cost of capital are as follows**

**Cost of debt. = 4.77%**

**Cost of preference = 10.53%**

**Cost of equity = 14.59%**

**Cost of Retained = 14%**

**Calculate average cost of capital using**

**(a) Book Value**

**(b) Market Value**

*Sol :*

**Book Value**

| Source of Fund | Amount | Proportion | Cost of Capital | WACC |
|---|---|---|---|---|
| Debentures | 300,000 | 0.3 | 4.77 % | 1.431 |
| Pref. share capital | 200,000 | 0.2 | 10.53 % | 2.106 |
| Equity share capital | 400,000 | 0.4 | 14.59 % | 5.836 |
| Retained earnings | 100,000 | 0.1 | 14 % | 1.400 |
| Total cost of capital | 10,00,000 | | | 10.773 |

Overall Cost of Capital = 10.773%

**Market Value**

| Source of Fund | Amount | Proportion | Cost of $3 \times 4$ | Capital WACC |
|---|---|---|---|---|
| Debentures | 300,000 | 0.25 | 4.77 % | 1.1925 |
| Pref. share capital | 200,000 | 0.17 | 10.53 % | 1.7901 |
| Equity share capital | 5,60,000 | 0.47 | 14.59 % | 8.4622 |
| Retained Earning | 1,40,000 | 0.12 | 14 % | 1.6800 |
| Total Cost of Capital | 12,00,000 | | | 13.1248 |

**28. A company has the following specific cost of capital along with the indicated book and market value weights,**

| Type of capital | Cost | Book value weights | Market value weights |
|---|---|---|---|
| **Equity** | **0.18** | **0.50** | **0.58** |
| **Preference shares** | **0.15** | **0.20** | **0.17** |
| **Long term debt** | **0.07** | **0.30** | **0.25** |
| | | **1.00** | **1.00** |

**(i) Calculate the weighted cost of capital, using book and market value weights.**

**(ii) Calculate the weighted average cost capital, using marginal weights, if the company intends to raise the needed funds using 50 percent long-term debt, 35 percent preference shares and 15 percent retained earnings.**

*Sol :* **(Aug./Sept.-16)**

**(i) Computation of Weighted Cost of Capital Using Book and Market Value Weights**

**Book-Value Weights**

| Source of Capital (1) | Book Value Weight (2) | Cost (3) | Total cost (4) = (2) × (3) |
|---|---|---|---|
| Equity | 0.50 | 0.18 | 0.09 |
| Preference shares | 0.20 | 0.15 | 0.03 |
| Long term debt | 0.30 | 0.07 | 0.021 |
| | | | **0.141** |

**Market-Value Weights**

| Source of Capital (1) | Market Value Weight (2) | Cost (3) | Total cost (4) = (2) × (3) |
|---|---|---|---|
| Equity | 0.58 | 0.18 | 0.1044 |
| Preference share | 0.17 | 0.15 | 0.0255 |
| Long term debt | 0.25 | 0.07 | 0.0175 |
| | | | **0.01474** |

∴ WCC - Book value = 0.141

WCC - Market value = 0.1474.

**(ii) Computation of Weighted Cost of Capital Using Marginal Cost**

**Marginal Cost**

| Source of Capital (1) | Market Value Weight (2) | Cost (3) | Total cost (4) = (2) × (3) |
|---|---|---|---|
| Retained earnings | 0.15 | 0.18 | 0.027 |
| Preference share | 0.35 | 0.15 | 0.0525 |
| Long term debt | 0.50 | 0.07 | 0.035 |
| | | | **0.1145** |

∴ WCC - Marginal cost = 0.1145.

## 2.9 Importance of Cost of Capital in Capital Budgeting Decisions

**Q36. State the Importance of Cost of Capital in Capital Budgeting and capital structure planning decisions.**

*Ans :*

The concept of cost of capital is very essential in financial management. It is useful in capital budgeting and in making decisions related to capital structure planning. The performance of a firm is analyzed with the help of concepts of cost of capital. The importance of cost of capital can be understood from the following points,

**1. Capital Budgeting Decision**

According to James T.S. Posterfield, "the concept cost of capital has assumed growing importance largely because of the need to devise a rational mechanism for making investment decisions of the firm". Cost of capital is taken into consideration while making capital budgeting decisions. With the help of cost of capital, firms accept or reject the projects. It is very useful in capital budgeting decision.

**2. Capital Structure Decisions**

In order to run a business smoothly, firm must maintain an appropriate level of debt and equity mix to finance the assets. At the time of preparing optimal capital structure, management must concentrate on maximizing the value of firm and minimizing cost of capital.

**3. Analyzing Financial Performance**

According to S.K. Bhattacharya, the concept of cost of capital is used to 'evaluate the financial performance of top management'. At the time of evaluating the performance of top management, the actual profitability of project is compared with overall estimated cost of capital. If profitability is more, then performance is satisfactory.

**4. Other Financial Decisions**

Many other financial decisions can be taken with the help of cost of capital such as dividend policy, capitalization of profits, working capital etc.

# Exercise Problems

1. A project cost ` 5,00,000 and yields annually a profit of ` 80,000 after depreciation @ 12% p.a. but before tax of 50%. Calculate the payback period.

   **[Ans: 7 years and 2 months (Apprx.)]**

2. A project costs ` 10,00,000 and has a scrap value of ` 2,00,000 after 5 years. The net profit before depreciation and taxes for the five years period are expected to be ` 2,00,000, ` 2,40,000, ` 2,80,000, ` 3,20,000 and ` 4,00,000 respectively. You are required to calculate'the Accounting rate of return, assuming 50% rate of tax and depreciation on straight line method.

   **[Ans: Profit after deprecation and tax = ` 64,000, ARR = 16%]**

3. As a financial manager of TAJ Ltd, Hubli, you have to advise the board of directors on choosing between to competing project proposals, which require an equal investment of ` 1,00,000 and expected to generate cashflows as under:

| Year | PV Factor at 10% | Project - I(`) | Project - II(`) |
|---|---|---|---|
| 2007 | 0.909 | 48,000 | 20,000 |
| 2008 | 0.826 | 32,000 | 24,000 |
| 2009 | 0.751 | 20,000 | 36,000 |
| 2010 | 0.683 | Nil | 48,000 |
| 2011 | 0.621 | 24,000 | 16,000 |
| 2012 | 0.564 | 12,000 | 8,000 |

   **[Ans: Net Present Value Project 1: ` 6,756 Project II: ` 12,272]**

4. You are given the following information relating to ABC Ltd. for the year of recent performance of an asset.

   Initial cash outlay ` 50,000

   Life of the asset 5 years

   Estimated annual cash flow ` 12,500

   **Calculate:**

   i) Payback period

   ii) IRR

   **[Ans: Payback Period: 4 years; IRR: 8.07%]**

5. The expected cash inflows of a new project are estimated as under:

| Year | Cash Inflow (`) |
|---|---|
| 1 | 1,50.000 |
| 2 | 2,50.000 |
| 3 | 3,50,000 |
| 4 | 2,50.000 |
| 5 | 2,00,000 |

   The initial investment required for the project is ` 7,00,000. The risk-adjusted discount rate is 12%. Evaluate as to wJiether the project proposal is worthwhile.

   **[Ans: NPV – ` 1,54,721]**

# Short Question and Answers

**1. Capital Budgeting.**

*Ans :*

**Meaning of Capital Budgeting**

Capital budgeting is the process of making investment decisions in capital expenditures. A capital expenditure may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in future. In simple language we may say that a capital expenditure is an expenditure incurred for acquiring or improving the fixed assets, the benefits of which are expected to be received over a number of years in future. The following are some of the Examples of capital expenditure :

a) Cost of acquisition of permanent assets as land and building, plant and machinery, goodwill, etc.

b) Cost of addition, expansion, improvement or alteration in the fixed assets.

c) Cost of replacement of permanent assets.

d) Research and development project cost, etc.

Capital expenditure involves non-flexible long-term commitment of funds. Thus, capital expenditure decisions are also called as long term investment decisions. Capital budgeting involves the planning and control of capital expenditure. It is the process of deciding whether or not to commit resources to a particular long term project whose benefits are to be realized over a period of time, longer than one year. Capital budgeting is also known as Investment Decision Making, Capital Expenditure Decisions, Planning Capital Expenditure and Analysis of Capital Expenditure.

**Definitions**

**i) According to Charles T. Horngreen** has defined capital budgeting as, "Capital budgeting is long term planning for making and financing proposed capital outlays."

**ii) According to G.C. Philippatos**, "Capital budgeting is concerned with the allocation of the firm's scarce financial resources among the available market opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent streams of expenditures for it".

**iii) According to Richard** and **Greenlaw** have referred to capital budgeting as acquiring inputs with long-run return.". In the words of Lynch, "Capital budgeting consists in planning development of available capital for the purpose of maximizing the long term profitability of the concern."

**2. Significant of capital budgeting to a firm.**

*Ans :*

Capital budgeting means planning for capital assets. Capital budgeting decisions are vital to any organisation as they include the decisions as to :

a) Whether or not funds should be invested in long term projects such as setting of an industry, purchase of plant and machinery etc.

b) Analyse the proposal for expansion or creating additional capacities.

c) To decide the replacement of permanent assets such as building and equipments.

d) To make financial analysis of various proposals regarding capital investments so as to choose the best out of many alternative proposals.

The importance of capital budgeting can be well understood from the fact that an unsound investment decision may prove to be fatal to the very existence of the concern. The need, significance or importance of capital budgeting arises mainly due to the following :

**i) Large Investments**

Capital budgeting decisions, generally, involve large investment of funds. But the funds available with the firm are always limited and the demand for funds far exceeds the resources. Hence, it is very important for a firm to plan and control its capital expenditure.

**ii) Long-term Commitment of Funds**

Capital expenditure involves not only large amount of funds but also funds for long-term or more or less on permanent basis. The long-term commitment of funds increases the financial risk involved in the investment decision. Grater the risk involved, greater is the need for careful planning of capital expenditure, i.e. Capital budgeting.

**iii) Irreversible Nature**

The capital expenditure decisions are of irreversible nature. Once the decision for acquiring a permanent asset is taken, it becomes very difficult to dispose of these assets without incurring heavy losses.

### 3. Features of Capital Budgeting Technique.

*Ans :*

Following are some of the features which a capital budgeting evaluation technique should posses :

i) The criterion must be able to incorporate all the cash flows associated with proposal.

ii) It should also incorporate the time value of money i.e., the cash flows arising at different point of time must be differentiated in respect of their worth to the firm.

iii) It should be capable of ranking different proposals in order of their worth to the firm.

iv) It should be objective and unambiguous in its approach. There should not be any scope for subjectivity of the decision maker.

v) The last but the least, the technique must be in the line with the objective of maximisation of shareholders wealth.

### 4. Payback Period

*Ans :*

The payback period is defined as the number of years required for the proposal's cumulative cash inflows to be equal to its cash outflows. In other words, the payback period is the length of time required to recover the initial cost of the project. The payback period therefore, can be looked upon as the length of time required for a proposal to 'break even' on its net investment.

**Calculation of the Payback Period**

The payback period can be calculated in two different situations:

**i) When Annual Inflows are Equal**

When the cash inflows being generated by a proposal are equal per time period, i.e., the cash inflows are in the form of an annuity, the payback period can be computed by dividing the cash outflow by the amount of annuity.

**ii) When the Annual Cash Inflows are Unequal**

In case the cash inflows from the proposal are not in annuity form then the cumulative cash inflows are raised to compute the payback period.

### 5. Advantages of Average Rate of Return

*Ans :*

The advantages of average rate of return method are as follows:

**i) Easy to Calculate**

It is easy to calculate because it makes use of readily available accounting information. In contrast, discounted cash flow technique involves tedious calculations.

**ii) Considers Entire Cashflows**

It takes into consideration the entire cash inflows during the project life. Payback Method does not use the entire stream of incomes.

**iii) Based on Financial Data**

As this method is based upon accounting concept of profits, it can be readily calculated from the financial data.

**6. Define Net Present Value.**

*Ans :*

The cash inflow in different years are discounted (reduced) to their present value by applying the appropriate Miscount factor or rate and the gross or total present value of cash flows of different years are ascertained. The total present value of cash inflows are compared with present value of cash outflows (cost of project) and the net present value or the excess present value of the project and the difference between total present value of cash inflow and present value of cash outflow is ascertained.

**7. What is Internal Rate of Return**

*Ans :*

The internal rate of return is also one of the capital budgeting technique that identifies the time value of money. This method is also known as yield method, discounted rate of return and trial and error yield method. It is that rate of return which equates the present value of cash inflows to the present value of cash outflows. The hit and trial method is used in internal rate of return method to discount the cash flows of the project as discount rate is not known. The internal rate of return is calculated with the help of the following formula.

$$C = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots.. + \frac{A_n}{(1+r)^n}$$

Where,

C – Initial outlay at time zero

r – Rate of discount of internal rate of return

$A_1$ , $A_2$, ... $A_n$ – Future net cash flows at different periods

n – Number of years.

The internal rate of return method involves following steps,

i) Calculate the future cash inflows before depreciation but after tax.

ii) Calculate fake payback period by dividing the initial investment by average cash flows. Initial investment

$$\boxed{\text{Fake payback period} = \frac{\text{Initial investment}}{\text{Average cash flows}}}$$

iii) Identify the discounting factor from present value annuity table and calculate NPV with that percentage.

iv) If NPV is positive take a higher rate and if NPV is negative take a lower rate and once again calculate NPV.

v) After getting one positive NPV and one negative NPV, use interpolation to calculate actual IRR.

Actual IRR can be calculated by using the following formula,

$$\boxed{\text{Lower rate} + \frac{\text{Present value at lower rate} - \text{Cash outflow}}{\text{PV at lower rate} - \text{PV at higher rate}} \times \text{Difference in the rates}}$$

A particular project is accepted when IRR is more than cost of capital and if IRR of the project is less than cost of capital it is rejected.

**8. Difference between NPV and IRR.**

*Ans :*

The differences between NPV and IRR are as follows,

**i) Ranking Mutually Exclusive Projects**

Mutually exclusive projects are those in which only one investment proposal is accepted and others are ignored. The NPV and IRR methods may result in inconsistent ranking of mutually exclusive projects.

Following are the conditions in which NPV and IRR rules results in inconsistent ranking.

(a) The cash flow pattern of the projects may change i.e., cash flows of one project may increase and cash flows of other projects may fall.

(b) Even the initial investment of the projects may change.

(c) The duration of life may be different for different projects.

**ii) Incremental Approach**

In order to select a profitable project from mutually exclusive projects by using IRR method, it is necessary to calculate rate of return on the incremented cash flows.

**iii) Reinvestment Assumption**

Occasionally, NPV and IRR rules depends on the implied assumption of reinvestment of cash flows which were produced in the lifetime of project. It is explained that conflict between NPV and IRR arise due to differences in their implicit reinvestment rates. When IRR method is used, cash flows must be reinvested on its internal rate of return and in case of NPV method, cash flows must be reinvested on its opportunity cost of capital.

**iv) Changing Cost of Capital and the IRR Rule**

It is assumed that, opportunity cost of capital is constant throughout the period. But, it is not possible in real life. The IRR rule may result in many complexities if opportunity cost of capital fluctuates.

When opportunity cost of capital fluctuates, NPV is calculated as,

$$NPV = \frac{C_1}{(1+K_1)^1} + \frac{C_2}{(1+K_2)^2} + .... + \frac{C_n}{(1+K_n)^n} - C_o$$

Every period have an opportunity cost of capital, it is difficult to compare IRR with any of these costs. It is easy to evaluate NPV with different opportunity costs when compared to IRR.

**9. Explain various measures of cost of capital ?**

*Ans :*

The cost of capital is very important for making decisions. Cost of capital involves different costs related to different sources of finance, it is useful in making financial decisions. It is necessary for every firm to compute cost of capital before making decisions. The evaluation process of cost of capital involves two steps.

i) Calculation of different costs which are the sources of finance.

ii) The overall cost is calculated by combining different costs into a composite cost.

Hence it is essential to compute the' specific cost of each source to evaluate minimum obligation of a company i.e., composite cost of raising capital.

1. Cost of debt
2. Cost of preference capital
3. Cost of equity share capital
4. Cost of retained earnings.

**10. Weighted Average Cost of Capital.**

*Ans :*

The average cost of the costs of several means of financing, is known as weighted average cost of capital. It can also be termed as overall cost of capital, composite cost of capital or average cost of capital.

Weighted average cost of capital can be easily evaluated, if cost of a particular source of finance is evaluated.

WACC can be computed as follows,

$$WACC = w_e k_e + w_d k_d + w_p k_p$$

Where,

$w_e$ = Proportion of equity capital

$w_d$ = Proportion of debt capital

$w_p$ = Proportion of preference capital

$k_e$ = Cost of equity capital

$k_d$ = Cost of debt after tax

$k_p$ = Cost of preference capital.

**11. Marginal Cost of Capital (MCC)?**

*Ans :*

The incremental cost incurred by the company for raising additional funds is known as marginal cost. The marginal cost is an important concept in taking decisions relating to financial matters. When marginal weights are used in calculation of weighted average cost of new capital then it is called as marginal cost of capital. The marginal weights imply the amount of different sources of funds utilized in raising additional funds. The marginal weights are also termed as firm's target capital structure which the firm tries to continue in long run.

1. WMCC refers to the cost of raising additional new funds whereas WACC is the cost of raising total new funds in an accounting period.
2. When firm utilize its prevailing capital structure and component costs are same, then WMCC is equal to WACC.
3. When firm raise additional funds then component costs change, hence WMCC is not equal to WACC.
4. WMCC does not consider the impact of new financing plans in long run, so WACC is used for maximizing shareholder's wealth in long-run.

**12. What similarities are there between the risk-adjusted discount rate method and the certainty-equivalent method ?**

*Ans :*

While the risk-adjusted discount rate method provides a means for adjusting the riskiness of the discount rate, the certainty equivalent method adjusts the estimated value of the uncertain cash flows.

The risk-adjusted discount rate method extends the cash flow valuation model under certainty to the uncertainty case as follows:

$$V = \sum_{t=1}^{N} \frac{\bar{X}_t}{(1+r_t)^t},$$

where

V = Value of Capital budgeting project,

$\bar{X}_t$ = median or mean of the expected risky cash flow t distribution $X_t$,

$r_t$ = the risk adjusted discount rate appropriate to the riskiness of the uncertain cash flows $\tilde{X}_t$,

N = the life of the project.

The certainty equivalent method uses the rationale that given a risky cash flow, the decision maker will evaluate this cash flow according to an expected utility, the utility estimate being hypothesized to be equal to utility derived from some certain cash flow amount. The decision maker performs this process for each cash flow. The valuation model is as follows:

$$V = \sum_{t=1}^{N} \frac{C_t}{(1+i)^t},$$

where

$C_t$ = certainty equivalent cash flow at period t,

i = riskless interest rate.

$C_t$ can be expressed as a fraction of the expected value of the cash flow as follows:

$$C_t = \alpha_t \bar{X}_t,$$

where $\alpha_t$ = some fractional value.

The valuation formula becomes

$$V = \sum_{t=1}^{N} \frac{\alpha_t \bar{X}_t}{(1+i)^t}.$$

Since both models evaluate future uncertain cash flows, they should yield the same value for a given cash flow stream. The present value of each period's cash flows should be the same.

| | |
|---|---|
| UNIT III | **Capital Structure and Dividend Decisions:** Capital structure vs. financial structure - Capitalization, financial leverage, operating leverage and composite leverage. EBIT-EPS Analysis, Indifference Point/Break even analysis of financial leverage, Capital structure Theories –The Modigliani Miller Theory, NI, NOI Theory and Traditional Theory –A critical appraisal.<br>**Dividend Decisions:** Dividends and value of the firm - Relevance of dividends, the MM hypothesis, Factors determining Dividend Policy - dividends and valuation of the firm - the basic models – forms of dividend. Declaration and payment of dividends. Bonus shares, Rights issue, share-splits, Major forms of dividends – Cash and Bonus shares. Dividends and valuation; Major theories centered on the works of Gordon, Walter and Lintner. A brief discussion on dividend policies of Indian companies. |

## 3.1 Capital Structure

**Q1. Define capital structure ? Explain the features of capital structure.**

*Ans :*

Capital structure in simple words refers to debt equity ratio of a company. In other words it refers to the proportion of debt in the investments of the company. It is important for a company to have an appropriate capital structure. Estimation of capital requirements is necessary, but the formation of capital structure is important.

**Definition :**

**According to Gerestenbeg,** "Capital structure of a company refers to the composition or make-up of its capitalization and it includes all long term capital resources i.e., loans, reserves, shares and bonds.

The capital structure is made up of debt and equity securities and refers to permanent financing of a firm. It is composed of long term debt, preference share capital and share holder's funds.

Financial Manager should develop an appropriate capital structure, which is helpful to maximize shareholders wealth. This can be possible when all factors which are relevant to the company's capital structure are properly analyzed, balanced and considered.

**An appropriate capital structure should have the following features:**

**i) Profitability**

The company should make maximum use of leverage at a minimum cost. In other words, it should generate maximum returns to owners without adding additional cost.

**ii) Flexibility**

Flexible capital structure means it should allow the existing capital structure to change according to the changing conditions without increasing cost. It should be possible for the company to provide funds whenever needed to finance its possible activities. The company should be able to raise funds whenever the need arises and also retire debts whenever it becomes too costly to continue with that particular source.

**iii) Solvency**

The use of excessive debt threatens the solvency of the company. Debt should be used till the point where debt does not add significant risk, otherwise use of debt should be avoided.

**iv) Control**

The capital structure should involve minimum dilution of the control of the company. A company that issues more and more equity, dilutes the power of existing shareholders as number of shareholders increases. Also raising of additional funds through public issue may lead to dilution of control.

**v) Cost of capital**

If cost of any component of capital structure of the company like interest payment on debt is very high then it can increase the overall cost of capital of the company. In such case the company should minimize the use of that component of capital structure in its total capital structure.

**vi) Flotation costs**

It is the cost involved in issuing a security or a debt. If such cost is too high for new issue of any component of capital structure, then the use of such a source of fund should be minimized.

### Different forms of Capital Structure

The different forms of capital structure

1. equity share capital only
2. equity share capital + preference share capital
3. equity share capital + long term debentures
4. equity share capital + preference share capital+ long term debentures.

### Q2. What is optimal capital Structure ?

*Ans :*

An optimal or sound capital structure can be properly defined as that combination of debt and equity that attains, the stated managerial goal in the most relevant manner-the maximization of the firm's market value. Moreover, the optimal capital structure is also defined as the combination of debt and equity that minimizes the firms cost of capital.

Hence the optimal capital structure is concerned with the two important variables at one time-the minimization of cost as well as maximization of worth. These desired objectives can be achieved only with the help of a sound capital structure possessing the following characteristics :

**1) A Conservative Capital Structure**

An attempt should be made to secure as far as possible a conservative capital structure consisting of high grade securities. By doing so, the management should decide on the form of securities to be issued only after a thorough consideration of the possible effects of the proposed securities on the firm, its credit, value of other securities Issue of securities in the future, maintenance of profits and future rearrangement of its financial structure etc.

Such capital structure offers certain decisive advantages to the company, namely, the company's cost of financing is the least, its prospects for raising capital even in unfavourable views are good and it can maintain healthy relations with security holders.

**2) A Simple Capital Structure**

As far as possible, a simple capital structure should be preferred to A complicated one. It is easy to manage it The investors have a very clear picture of their rights and worth of their investments.

**3) Minimum Remuneration**

As far as possible, the fixed cost burden on the income statement of the firm must be low. To achieve this aim, a proper policy of trading on equity should be followed.

**4) Profitability**

The capital structure of the company should be most advantageous. Within the constraints, maximum use of average at a minimum cost should be made.

**5) Solvency**

The use of excessive debt threatened the solvency of the firm. Hence, its judicious mix should be perfect with the equity.

**6) Flexibility**

It should be possible for a company to adapt its capital structure with a minimum cost and delay if warranted by a changed situation.

**7) Conservation**

The debt Capacity of the company should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows.

**8) Control**

The capital structure should involve minimum risk of loss of control of the company.

**9) Economy**

Securities should be issued in such a manner as to entail the least cost of sale, cost of financing and so on. Generally, spread is the lowest in case of issue of debenture, and the highest in case of equity shares.

**10) Attractive for Investors**

Various securities proposed to be issued should offer certain attractions to the investors either relating to income, control, or convertibility etc.

**Q3. Explain the factors determining capital structure.**

**(OR)**

**Briefly explain the factors that influence the planning of the capital structure in practice.**

*Ans :* **(Nov.-20, Feb.-17, March-15)**

**1. Cost Principle**

An ideal capital structure is one that tends to minimize cost of financing and maximize earnings per share. Cost of capital is subject to interest rate at which the company has borrowed, tax status of the company and the required rate of return of the equity share holders. Debt capital is cheaper than equity capital due to the fixed rate of interest, bond holders can not participate in superior profits. Hence the rate of interest on debentures is usually much less than the dividends. Apart from this, interest on debt is a deductible expense for income tax purpose, Debt financing gives tax shelter which enhanced the value of the firm.

**2. Risk Principle**

Debt involves commitment for a long period to pay interest regularly and repayment of principal. This may expose the equity share holders to risk when the earnings decline to such low level that debt servicing is not possible. It may result in foreclosure or losing part of assets of the equity share holders. The concept of fixed charge burden on earnings is called as financial risk arising from the use of debt funds in capital structure.

**3. Control Principle**

In designing appropriate financing plan the manager should also try to keep the control / sovereignty over the Corporate wealth undisturbed. Since additional issue of equity share dilutes the voting right of existing share holders, a share holder who had predominant control over the affairs of the company would lose his position because new share holders would share control with him.

**4. Flexibility principle**

As per the principle of flexibility management should strive for combination of securities, which can be changed in tune with the developments in money market., capital market and the internal operations. Capital structure should assure maneuverability i.e.. Possibility of shifting to more favourable / cheaper terms of loan/debt, early retirement call option provision and excess resources at the command of the company etc.

**5. Timing Principle**

Timing also plays an important role in capital structure decision. In order to choose right type of instruments and seize the market opportunities for minimizing the cost of raising capital and obtaining substantial savings, timing of the issue of shares/debentures is also an important factor. In times of boom, due to all round business expansion and prosperity investors have strong desire to invest, hence easy to sell equity share/debentures.

**6. Legal Requirements**

The promoters of the company have also to keep in view the legal requirements while deciding about the capital, structure of the company. This is particularly true in case of banking companies which are not allowed to issue any other type of security for raising funds except equity share capital on account of the Banking Regulation Act.

**7. Loan Covenents**

Restrictive covenents are commonly included in long term loan agreements and debentures. These restrictions crucial the company's freedom in dealing with the financial matters and put it in an inflexible position. Covenents in loan agreements may include restrictions to distribute cash dividends, to incur capital expenditure, to raise additional external finances or to maintain working capital at a particular level..

**8. Market sentiments**

The Market sentiments also decide the capital structure of the company. Some times people want to have absolute safety. In such cases, it will be appropriate to raise funds by issue of debentures. At some other instance , people may be interested in earning high speculative incomes, at such times, it will be appropriate to raise funds, by issue of equity shares. Thus, it must take into account market sentiments, otherwise its issue may not be successful.

**9. Characteristics of the company**

Companies which are of small size have to rely considerably upon the owners' fund for financing. Such companies find it difficult to obtain long term debt. Large companies are generally considered to be less risky by the investors and, therefore, they can issue different types of securities and collect their funds from different sources other characteristics like technology credit standing, age of the company, stability and track record of earnings, management attitude also have significant bearing on the capital structure decision.

**10. Government Policy**

Government policy is also an important factor in planning the company's capital structure. For example a change in the lending policy of financial institutions may mean a complete change in the financial pattern. Similarly, by virtue of the securities & Exchange Board of India Act, 1992 and the Rules made thereunder, guide lines issued by SEBI are mandatory in this regard.

**11. Industry characteristics**

the management should attach more significance to maneuverability risk principles in choosing the financial instruments for the firms whose sales fluctuate more closely with the business cycle. Similarly degree of competition decides the degree of business risk. Capital structure is also influenced by the life cycle of the industry to which the company belongs.

Thus, there are many factors which are to be considered while designing an appropriate capital structure of the company.

## 3.2 Capital Structure vs. Financial Structure

**Q4. Distinguish between Capital Structure and Financial Structure.**

*Ans :* **(Sep.-16, March-12)**

| S.No. | Criteria | Capital Structure | Financial Structure |
|---|---|---|---|
| 1. | **Meaning** | Capital structure refers to the permanent financing of an organization. | Financial structure refers to the way in which the assets of an organization are financed |
| 2. | **Definition** | Gerstenberg defined capital structure as the "make up of a firm's capitalization". | It does not have may authorized definition. |
| 3. | **Nature** | Capital structure is represented by long-term debt and shareholder's funds. | The financial structure is represented by long term debt and equity. |
| 4. | **Scope** | It has a very narrow scope because capital structure deals only with the long -term sources of funds. | It has as wider scope because the financial structure deals with both long- term as well as short-term sources of funds. |
| 5. | **Importance** | It is one of the section of financial structure. | It includes capital structure |
| 6. | **Dependency** | It depends on nature of investment. | It depends on sources of capital |
| 7. | **Factors Influencing** | Capital structure decisions are influenced by the factors like financial leverage, growth and stability of sales, cost of capital, cash flow ability to service debt, capital market conditions, nature and size of firm and financing period. | The financial structure decisions of a firm are influenced by the factors like attitude of the management and its lenders, growth rate and stability of its sales, its competitive situation and its assets structure. |
| 8. | **Appearance in Balance Sheet** | It is recorded in the balance sheet under the heading of share holders fund and non-current liabilities. | It is recorded in the balance sheet under equities and liabilities side. |
| 9. | **Sources** | It included sources like equity capital, preference capital, retained earnings, debentures, long-term borrowings etc. | It includes the proportion of long term loans, short term obligation and equity share capital |

## 3.3 Capitalization

**Q5. Define capitalization ?**

*Ans :*

Basically, capitalization constitutes an important element of financial plan. The term "capitalization" emerges from the word 'capital' which is usually employed for representing the total amount of capital utilized in a business. Different scholars have proposed various definitions for the term 'capitalization'. Some of them includes,

1. **According to Guthman and Dougall** "Capitalization is the sum of the par value of stocks and bonds outstanding".
2. **According to Gerstenberg** Capitalization comprises of a company's ownership capital which includes capital stock and surplus in whatever form it may appear and borrowed capital which consists of bonds or similar evidences of long-term debt.
3. **According to Bonneville and Deway** Capitalization refers to the balance sheet values of stocks and bonds outstanding.
4. Capitalization is defined as the sum total of the par value of all shares.

### Concept of Capitalization

According to the narrow concept of capitalization it only deals with the long-term debts but, the modern economist argue that it has broad definition which also covers the short-term debts. According to Walker and Baughn, "the use of capitalization refers to only long-term debt and capital stock, and short-term creditors do not constitute suppliers of capital is erroneous. Practically, the total capital is a combination of both short-term creditors and long-term creditors". They also suggested that the sum of capital stock and long-term debt constitutes capital instead of capitalization.

According to the modern concept, capitalization includes,

i) Share capital
ii) Long-term debt
iii) Reserves and surplus
iv) Short-term debt and
v) Creditors.

**Q6. Explain the theories of capitalization ?**

*Ans :*

### Theories of Capitalization

In order to determine the capital requirements of a newly promoted company the following two theories of capitalization are generally employed.

### 1. Cost Theory of Capitalization

According to cost theory, the amount of capitalization in equal to the total cost incurred in setting up of a corporation as a going concern. Thus the estimation of capital requirements of a newly promoted company is based on the total initial outlays for setting up of a business enterprise. The amount of capitalization of a company, is determined by aggregating the following:

i. The cost of fixed assets, such as land and building, plant and machinery, goodwill, patents, furniture and fixture, etc.
ii. The amount of regular working capital required to carry on business operations.
iii. The expenses of promotion.
iv. The cost of establishing the business.

The original outlays on all these items form the basis for determining the amount of capitalization. This theory enables the promoter to know the total initial amount of capital which they should raise. It is suitable for determining the financial requirements or the amount of capitalization of a newly promoted corporation.

### Advantages of Cost Theory

The cost theory is useful for those enterprises in which the amount of fixed capital is more and whose earnings are regular, such as construction and public utility institutions.

### Disadvantages of Cost Theory

i. This theory suffers from the basic drawback that the amount of capitalization is judged by a figure based on the cost of establishing and starting a business, and not by its earning. It fact, the amount of capitalization is determined by what a firm earns and not by what ha been invested in it. This theory does not explain whether the capital invested in a business is justified by its earnings.
ii. This theory is not satisfactory in the case of a growing concern whose earnings keep on changing whereas the amount of capitalization remains constant.

iii. This is not useful for those enterprises in which the operating cost is changing, earnings are not regular and certain, and which carry on their business under competitive conditions.

**2. Earning Theory of Capitalization**

According to this theory the real worth of a business enterprise is determined by (i) its earning capacity, (ii) its annual earnings. As the basic objective of an enterprise is to earn profit, the amount of capitalization for it should be in accordance with its earnings. The value of capitalization of a company is equal to the capitalized value of its estimated earnings. Thus, the process of capitalization begins with the estimation of future earnings of the company.

The manager forecasts sales and production costs of the company to arrive at the estimated earnings which are, then, compared with he actual earnings, of other companies of similar size carrying on the similar business. Now for determining the amount of capitalization the rate of earnings in similar companies is applied to the estimated annual earnings of the company. The amount of capitalization of a company can be computed by using the following formula.

Amount of Capitalization - Estimated Annual Earnings x Rate of Capitalization

**i) Annual Earnings:** The probable earnings of an established company estimated on the basis of average of earnings during the past year. Real estates of possible future earnings may be had by considering the various internal and external factors affecting the annual earnings of the company. It is very difficult to forecast the amount due to the reason that the earnings newly promoted companies depend upon various other factors besides capitalization, such as general price level, elasticity of demand, operating costs, extent of competition, industrial and tariff policies of the government etc.

The net income of the newly promoted companies may be forecasted on the basis of estimates of operating costs and volume of sales based on the experience of the promoters or management. For ascertaining the reliability and accuracy, these estimates should be compared with the actual figures of costs and sales of existing companies in size, age, location level of management, rate of growth and other similar factors. After deducting the operating costs from the operating income the net earnings arrived at may be used for determining the amount of capitalization.

**ii) Rate of Capitalization:** This is necessary for determining the amount of capitalization of a company. The annual net earnings of a company are capitalized at the rate of capitalization. It may be determined by studying the rate of return in similar companies in the same industry. It should reflect adequate return to the investors for the use of their funds and the risk they undertake. It may be calculated with the help of average price earnings ratio, which is computed on the basis of income and market value of share of other firms in the industry. However, determination of capitalization by price-earning ratio is considered suitable only when the entire capital is raised by issuing shares.

$$\frac{\text{Price Earning Ratio} = \text{Price Per Share (Equity Share)}}{\text{Earning Per Share (Equity Share)}}.$$

### 3.3.1 Over Capitalization

**Q7. Define over capitalization ? Explain the causes of over capitalization ?**

*Ans :* **(March-16)**

A company is over-capitalized when its earnings are consistently insufficient to yield a fair rate of return on the amount of capitalization of a company and when it is not in a position to pay interest on debentures and long-term borrowing, while dividends on shares are not at fair rates, it is said to be overcapitalized. This situation arises when a company raises more capital than what is justified by its actual earnings. Over capitalization does not necessarily mean abundance or excess of capital.

An over-capitalized company may be short of capital. A company may be over-capitalized because its capital is not effectively utilized, thus causing a constant decline in earnings. This leads to the inability of the company to pay normal rate of dividend and interest on shares and debentures respectively. It leads to fall in the market value of its shares. A company is overcapitalized if it has been unable to earn a fair or prevailing rate of return on its capital, and the market value of its shares is lower than the book value over a fairly long period of time.

### Definitions of Over-Capitalization

1. **According to C.W. Gerstenberg** "A corporation is over – capitalized when its earnings are not large enough to yield a fair return on the amount of stocks and bonds that have been issued, or when the amount of securities outstanding exceeds the current value of the assets".
2. **According to Harod Gilbert** "When a company has consistently been unable to earn the prevailing rate of return on its outstanding securities (considering the earnings of similar companies in the same industry and the degree of risk), it is to be over-capitalized".
3. **According to Hoagland** Whenever the aggregate of the par value of stock and bounds outstanding exceeds the true value of fixed assets, the corporation is said to be over-capitalized".

### Causes of Over-Capitalization

**1. High Promotional Expenses**

A company has paid high promotional expenses in the form of payments to promoters for their services, and excessive price for goodwill, trade marks, patents, copyright etc. Similarly, if the company is formed by converting a partnership firm or a private limited company into a public limited company and the assets transferred at highly inflated prices, the company will be over-capitalized because the book value of the company's assets will be higher than its real value.

**2. Purchase of assets During Inflationary Conditions**

Inflationary conditions affect both the newly promoted as well as the established companies. Companies have to pay high prices for purchase of fixed assets, and the amount of capitalization is kept high during boom period. But after the boom conditions subside and necessary conditions set in, the real value of the company's assets fall while the book value of its assets remain at a higher level therefore, the company becomes over-capitalized.

**3. Raising Excessive Capital**

Over – capitalization occurs if a company raises excessive capital than what it can utilize effectively. As a large amount of capital remains idle and ineffectively utilized, the company's earnings decline leading to fall in market value of its shares.

**4. Shortage of Capital**

Paucity of capital is the result of faulty financial planning. If compels the company to borrow capital at very high rates of interest. A large chunk of profits is given away to the creditors as interest leaving little to be distributed to the shareholders as dividends. As the rate of dividend falls the market value of shares also fall showing over-capitalization.

**5. Borrowing at Higher Interest Rates**

To meet its emergent needs if a company borrows a large amount of capital at a rate of interest higher than the rate of its earnings it will be over-capitalized. As a major part of its earnings will be taken away by the creditors as interest, the rate of dividend will fall, and the market price of shares would decline. Thus, lower market price of shares than the book value makes the company over-capitalized.

**Q8. Explain the effects of Over Capitalization.**

*Ans :*

Over capitalization influences the functioning of a company, its shareholders as well as the society in which the business is operating. The following aspects enable us to understand the evil effects of over capitalization.

**(i) Effects of Over Capitalization on Company**

Over capitalization leads to,

(a) Loss of goodwill

(b) The reduction in the efficiency of the firm

(c) The generation of inflated profits

(d) Liquidation of the company's assets

(e) The emergence of difficulties in procuring capital

(f) The loss of market share

(g) The decline in the credit worthiness.

**(ii) Effects of Over Capitalization on Shareholders**

**Over capitalization brings,**

(a) Reduction in dividends

(b) Decline in the value of shares

(c) Losses on speculation and

(d) Inappropriate results of re-organization due to the reduction in the face value of shares.

**(iii) Effects of Over Capitalization on Society**

Over capitalization results into,

(a) The loss of potential consumers due to the production of poor quality products at high cost.

(b) The decline/reduction in the earnings of the workers.

(c) The sub-optimal utilization of resources.

(d) Economic recession due to increased losses, production of poor quality products, retrenchment or under employment.

(e) Gambling in shares.

**Q9. Define under capitalization. What are the causes and effects of under capitalization?**

*Ans :*

According to Gerstenberg "A company may be under capitalized when the rate of profits it is making on the total capital is exceptionally high in relation to the return enjoyed by similarly situated companies in the same industry or when it has too little capital with which to conduct its business". In otherwords under capitalization is the reciprocal of over capitalization and exists when the actual capitalization of the firm is less than its proper capitalization (which was assured by its earnings capacity.

Under capitalization is witnessed due to the following reasons,

**1. Under Estimation of Capital Requirements**

Due to under estimation of the future capital requirements the firm has to face problem of non-availability of adequate capital for later stages. Then, it has to arrange cheaper debt at low rate of interest causing the EPS to increase. Such situation leads to under capitalization.

**2. Under Estimation of Future Earnings**

While developing the financial plan, if the future earnings of the firm are under estimated and if the actual earnings are more than the estimated figure then the firm tends to face the situation of under capitalization.

**3. Promotion during Depression**

The firms which are promoted during the period of depression have to experience under capitalization. This is because of the fact that the emergence of inflation causes the earnings to suddenly increase.

**4. Conservative Dividend Policy**

When the management of a firm makes use of conservative dividend policy under capitalization is observed. According to this policy, only a considerable portion of profits need to be distributed as dividends. Whereas, the major proportion of profits has to be reinvested into the business causing the scarcity of funds during certain operations of a firm.

5. **Highly Efficient Management**

The firms that are characterized by the presence of efficient management generates high rate of returns on their investment when compared to other companies of the same industry leading to the emergence of under capitalization.

6. **Trading through Equity Shares**

Usually, it has been observed that, the promoters tries to get hold over their companies and raises lower share capital than required for the formation of business capital. However, when the funds are required, it will be raised by trading through equities which have lower rate of interest than earnings causing the situation of under capitalization.

**Effects of Under Capitalization**

Under capitalization also effects the company, its shareholders and the society at large. The disadvantages of under capitalization can be studied as follows,

1. Enforces the management to expand and to change the market price of its shares.
2. In such situation, the earnings per share and dividend per share increases causing the marketability of shares to rise.
3. When the employees feel that the firms is earning high profits, then they will demand for higher wages and a conflict between the employers and workers affects both their efficiency and effectiveness.
4. Due to the generation of huge profits, government imposes high rates which acts as a financial burden for the companies.
5. As firms are receiving high earnings, it would attract the competitors to enter into the cut throat competition thus reducing the market shares of a firm.
6. As a result of over trading, firms did excessive business than the allowed limit causing the emergence of under capitalization.
7. Due to over trading of share, firms may not be in a position to pay off their debts to the creditors, which intum effects the credit worthiness of the firm.
8. Sometimes under capitalization results in over capitalization due to the generation of excessive profits, retained earnings and long term debt financing.

## 3.4 Leverages

**Q10. What is meant by Leverage ? Explain different types of leveages.**

*Ans :* **(Feb.-17)**

Leverage is the capability of a firm to make use of fixed cost assets or funds in order to increase the returns to the equity shareholders.

According to James Home, leverage is defined as "The employment of an asset or sources of funds for which the firm has to pay a fixed cost or fixed return".

There exists a direct relationship between degree of leverage, risk and return to the shareholders. Leverage can be classified into, operating and financial leverage.

**Income Statement Format**

| | | | |
|---|---|---|---|
| Operating leverage | Sales | xxx | Total leverage |
| | – variable | –xx | |
| | Cost | xxx | |
| | – Fixed cost | –xx | |
| | EBIT | xxx | |
| Financial leverage | – Interest | –xx | |
| | EBT/PBT | xxx | |
| | – Taxes | –xx | |
| | EAT/PAT | xxx | |
| | – Dividend | –xx | |
| | Retained earnings | xxx | |

**Types of Leverage**

There are basically three types of Leverage:

1. Operating Leverage OL (Equity)
2. Financial Leverage FL (Debt/Loan)
3. Combined Leverage CL ( Operating and financial)

### 1) Operating Leverage

Operating leverage results from the presence of fixed costs that help in magnifying net operating income fluctuations flowing from small variations in revenue. The fixed cost is treated as fulcrum of a leverage. The changes in sales are related to changes in revenue. The fixed cost so do not change in sales. Any increase in sales, fixed costs remaining the same, will magnify the operating revenue.

### 2) Financial Leverage

Financial leverage (FL) takes the form of a loan or other borrowings (debt), the proceeds of which are reinvested with the intent to earn a greater rate of return than the cost of interest. If the firm's rate of return on assets (ROA) is higher than the rate of interest on the loan, then its return on equity (ROE) will be higher than if it did not borrow.

On the other hand, if the firm's ROA is lower than the interest rate, then its ROE will be lower than if it did not borrow. Leverage allows greater potential returns to the investor than otherwise would have been available. The potential for loss is also greater, because if the investment becomes worthless, the loan principal and all accrued interest on the loan still need to be repaid.

### 3) Combined Leverage

The Degree of Combined Leverage (DCL) is the leverage ratio that sums up the combined effect of the Degree of Operating Leverage (DOL) and the Degree of Financial Leverage (DFL) has on the Earning per share or EPS given a particular change in shares. This ratio helps in ascertaining the best possible financial and operational leverage that is to be used in any firm or business.

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**Q11. Explain the relationship between leverage and the cost of capital.**

*Ans :* **(Dec.-19)**

- Debt and equity are the two major sources through which business organizations, especially corporations, raise funds required to meet their operational needs.
- A proper balance is necessary between debt and equity to ensure a trade-off between risk and return to the shareholders.
- A capital structure with reasonable proportions of debt and equity capital, which can maximize the shareholder's wealth to a limit possible and simultaneously can minimize the firm's cost of capital as a whole, is called optimal capital structure.
- The firms have to pay a fixed charge at every period irrespective to the firm's earnings. Equity provides ownership of the corporation to investors.
- Being owners, shareholders do have voting right and participate in company's management and control the company affairs.
- However, shareholders can not claim for dividend for any period until and unless it is decided and declared by the management.
- The cost of capital is concerned with what a firm has to pay for the capital – that is, the debt, preferred stock, retained earnings, and common stock – it uses to finance new investments.
- It can also be thought of as the return required by investors in the firm's securities.
- It can also be thought of as the minimum rate of return required on new investments undertaken by the firm.
- As such, the firm's cost of capital is determined in the capital markets and is closely related to the

degree of risk associated with new investments, existing assets, and the firm's capital structure.

- In general, the greater the risk of a firm as perceived by investors, the greater the return investors will require and the greater will be the cost of capital
- Traditional approach and MM approach contradict on the relationship of leverage a However, the cost of capital would increase after a reasonable level of debt.
- On the other hand, MM concluded no relationship between leverage and cost of capital. In their approach, the capital structure decisions are irrelevant cost of capital.
- Traditionalists assume a negative relationship between these variables

### 3.4.1 Financial Leverage

**Q12. Why must the financial manager keep in mind the degree of financial leverage in evaluating various financial plans? When does financial leverage become favourable and unfavourable ?**

**(OR)**

**Define financial leverage.**

*Ans :* **(Aug.-17)**

Financial leverage is concerned with financing activities of a firm. According to Gitman, it is defined as the "ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share". It results from the use of fixed cost financing and also specify the extent to which the Earnings Per Share (EPS) will be affected with the change in Earning Before Interest and Tax (EBIT).

**Favourable of Financial Leverage**

The impact of financial leverage can be favourable or unfavourable. When firm yields more profits on the assets acquired with the funds than the fixed cost of their use. Then it is a favourable or positive leverage and when firm does not earn profits even equal to the cost of funds then it is called as unfavourable or negative leverage.

The degree of financial leverage evaluates the effect of change in operating income (EBIT) on change in earning capital or on equity share. Degree of financial leverage is calculated as,

$$DFL = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

Alternatively, it can be calculated as,

$$DFL = \frac{EBIT}{EBT\,(EBIT - I)}$$

Financial leverage is used to plan the proportion of debt and equity in order to increase earning per share. Some of the importance of financial leverage are explained below.

**1. Designing of Capital Structure**

The capital structure involves raising of long-term funds, which can be raised from shareholders and long-term creditors. The financial manager is responsible to ascertain the proportion of fixed cost funds and equity share capital. The consequences of borrowing on cost of capital and financial risk involved must be considered before finalizing a capital structure.

**2. Profit Planning**

The degree of financial leverage have an impact on earning per share. With the increase in profitability of the firm, the availability of profits for equity stockholders increase with the help of fixed cost funds. Hence, financial leverage is an important element in profit planning.

**Drawbacks of Financial Leverage**

Following are some of the limitations of financial leverage,

**1. Double-edged Weapon**

Financial leverage is similar to a double-edged weapon. In order to employ it effectively to increase the earnings of the shareholders, the rate of earnings of the firm must be more than fixed rate of interest or dividend on debentures. Financial leverage have a negative impact when its profits is not equal to the cost of interest bearing securities.

2. **Useful to Companies with Stable Earnings**

   Financial leverage is useful only to those companies which have constant and regular earnings. In order to pay interest on debentures, company must have regular income.

3. **Increases Risk and Rate of Interest**

   Financial leverage leads to increase in risk and rate of interest which are the results of extra debt.

4. **Hindrances from Financial Institutions**

   The companies which are utilizing excess of financial leverage are restricted by financial institutions, due to risk factor and in order to maintain balance in capital structure of the company.

### 3.4.2 Operating Leverage

**Q13. What is operating leverage ? How does it help in magnifying revenue of concern?**

*Ans :* **(Aug.-17)**

The operating leverage is defined as the capability of firm to use fixed operating costs to increase the effect of changes in sales on its earnings before interest and taxes When fixed operating costs exist in a firm then it lead operating leverage.

Operating leverage evaluates the effect of change in sales quantity and operating capacity on earning bet re interest and taxes. The Degree of Operating Le' (DOL) computes operating leverage.

DOL at Q units of output,

$$= \frac{\text{Percentage change in PBIT}}{\text{Percentage change in output(Q)}}$$

If there is any change in level of output then the, degree of operating leverage will also change.

The degree of operating leverage can be calculated alternatively with the help of following formula,

$$DOL_Q = \frac{Q(P-V)}{Q(P-V)-F} = \frac{\text{Contribution}}{\text{PBIT}}$$

Where,

Q = Output

P = Profit

V = Variable cost

F = Fixed cost

**Example**

The calculation of DOL is explained in following example,

Information of Thomson Ltd.

Profit = Rs. 25,000

Variable cost = Rs. 20,000

Fixed cost = Rs. 1,00,000

The DOL computed for 8,000 and 10,000 units.

*Sol. :*

For 8,000 units,

$$DOL = \frac{Q(P-V)}{Q(P-V)-F}$$

$$= \frac{8000(25,000-20,000)}{8000(25000-20000)-1,00,00,000}$$

$$= \frac{4,00,00,000}{3,00,00,000} = 1.33$$

For 10,000 units,

$$= \frac{10,000(25000-20,000)}{10,000(25,000-20,000)-1,00,00,000}$$

$$= \frac{5,00,000}{4,00,000} = 1.25$$

**DOL and Production Planning**

In production planning, DOL is an essential component which must be considered. Firm can use labour- saving machinery in order to change its cost structure. It helps in reducing variable labour costs, but increases fixed operating costs. When there is an increase in operating costs and decrease in variable costs, it normally increases the DOL.

A simplified formula for DOL is obtained from the following,

$$\frac{\Delta PBIT / PBIT}{\Delta Q / Q} = \frac{\Delta[Q(P-V)-F] / Q(P-V)-F}{\Delta Q / Q}$$

### 3.4.3 Composite Leverage

**Q14. Define Composite (or) combined Leverage.**

*Ans :*

Operating leverage measure percentage change in operating profit due to percentage change in sales. It explains the degree of operating risk. Financial leverage measures percentage change in taxable profit (or EPS) on account of percentage change in operating profit (i.e., EBIT).

Thus, it explains the degree of financial risk. Both these leverages are closely concerned with the firm's capacity to' meet its fixed costs (both operating and financial). In case both the leverages-are combined, the result obtained will disclose the effect of change in sales over change in taxable profit (or EPS).

Composite leverage, thus, expresses the relationship between revenue on account of sales (i.e., contribution or sales less variable cost) and the taxable income. It helps in finding out the resulting percentage change in taxable income on account of percentage change in sales. This can be computed as follows:

Composite Leverage = Operating Leverage × Financial Leverage

$$= \frac{C}{OP} \times \frac{OP}{PBT} = \frac{C}{PBT}$$

where,

C = Contribution (i.e., Sales – Variable cost),

OP = Operating Profit or Earning Before Interest & Tax (EBIT),

PBT = Profit before Tax but After Interest.



## PROBLEMS ON LEVERAGES

**1. A Company has sales of Rs. 5,00,000, variable costs of Rs. 3,00,000, fixed costs of Rs. 1,00,000 and long-term loans of Rs. 4,00,000 at 10% rate of interest. Calculate the combined leverage.**

**Solution :**

i) Operating Leverage $= \frac{\text{Contribution}}{\text{Earning before interest and tax}} = \frac{\text{Sales} - \text{Variable Cost}}{\text{EBIT}}$

$$= \frac{5,00,000 - 3,00,000}{1,00,000} = \frac{\text{Rs. } 2,00,000}{\text{Rs. } 1,00,000} = 2$$

ii) Financial Leverage $= \frac{\text{Sales} - \text{Variable Cost} - \text{Fixed Cost}}{\text{Sales} - \text{Variable cost - Fixed cost - Interest}}$

$$= \frac{\text{Rs. } 5,00,000 - \text{Rs. } 3,00,000 - \text{Rs. } 1,00,000}{\text{Rs. } 5,00,000 - \text{Rs. } 3,00,000 - \text{Rs. } 1,00,000 - \text{Rs. } 40,000}$$

$$= \frac{\text{Rs. } 1,00,000}{\text{Rs. } 60,000} = \frac{5}{3}$$

iii) Combined Leverage = Operating Leverage $\times$ Financial Leverage

$$= \frac{2}{1} \times \frac{5}{3} = \frac{10}{3}$$

**2. Calculate the operating leverage ratio for each of the four firms.**

| **Particulars** | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| **Sales price per unit** | **Rs. 20** | **Rs. 32** | **Rs. 50** | **Rs. 70** |
| **Variable cost per unit** | **Rs. 6** | **Rs. 16** | **Rs. 20** | **Rs. 50** |
| **Fixed operating cost** | **Rs. 80,000** | **Rs. 40,000** | **Rs. 200,000** | **–** |

**For the purpose of perfect calculation use a base level of 5,000 units in each case.**

*Sol :*

**Calculation of Contribution and Earnings before Interest and tax [EBIT]**

| **Particulars** | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| Sales (Selling price × units) | Rs.1,00,000 | Rs.1,60,000 | Rs.2,50,000 | Rs.3,50,000 |
| Less : Variable cost (Variable cost per unit × units) | Rs.30,000 | Rs.80,000 | Rs.1,00,000 | Rs.2,50,000 |
| Contribution (S-V) | Rs.70,000 | Rs.80,000 | Rs.1,50,000 | Rs.1,00,000 |
| Less : Fixed cost | Rs.80,000 | Rs.40,000 | Rs.2,00,000 | – |
| EBIT | Rs.–10,000 | Rs.40,000 | Rs.– 50,000 | Rs.1,00,000 |

**Calculation of Operating leverage**

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$A = \frac{70,000}{(-)10,000} = -7$$

$$B = \frac{80,000}{40,000} = 2$$

$$C = \frac{150,000}{-50,000} = -3$$

$$D = \frac{100,000}{100,000} = 1$$

**3. From the following selected operating data determine the Break-even sales and operating leverage.**

| **Particulars** | **Company A** | **Company B** |
|---|---|---|
| **Sales** | **Rs. 25,00,000** | **Rs. 30,00,000** |
| **Fixed cost** | **Rs. 7,50,000** | **Rs. 15,00,000** |

**variable expenses as a percentage of sales for company A = 50% and company B = 25%.**

*Sol :*

**Calculation of contribution and EBIT**

| **Particulars** | **Company - A** | **Company - B** |
|---|---|---|
| Sales | Rs. 25,00,000 | Rs. 30,00,000 |
| Less : Variable cost (50% and 25% of sales) | Rs. 12,50,000 | Rs. 7,50,000 |
| Contribution (S – V) | Rs. 12,50,000 | Rs. 22,50,000 |
| Less : Fixed cost | Rs. 7,50,000 | Rs. 15,00,000 |
| EBIT [Earnings before interest & tax] | Rs. 5,00,000 | Rs. 7,50,000 |

**Calculation of Operating Leverage (OL)**

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$\text{Company A} = \frac{12,50,000}{5,00,000} = 2.5$$

$$\text{Company B} = \frac{22,50,000}{7,50,000} = 3$$

**Calculation of Break-even point (BEP)**

$$\text{BEP} = \frac{\text{Fixed cost} \times \text{sales}}{\text{sales - variable cost}}$$

$$\textbf{Company A} = \frac{Rs.7,50,000 \times Rs.25,00,000}{Rs.25,00,000 - Rs.12,50,000}$$

$$= \frac{Rs.7,50,000 \times Rs.25,00,000}{Rs.12,50,000} = Rs.15,00,000$$

**Company B** $= \dfrac{Rs.15,00,000 \times Rs,30,00,000}{Rs.30,00,000 - Rs.750,000}$

$$= \frac{Rs.15,00,000 \times 30,00,000}{Rs.22,50,000} = Rs.20,00,000.$$

**4. Calculate the Degree of operating leverage.**

| Particulars | 1987 | 1988 |
|---|---|---|
| Sales | Rs. 200,000 | Rs. 250,000 |
| EBIT | Rs. 60,000 | Rs. 75,000 |

*Sol :*

Calculation of Degree of operation leverage [DOL]

$$\text{DOL} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

$$\text{DOL} = \frac{0.25}{0.25} = 1 \ \text{(or)} \ \frac{25\%}{25\%} = 1$$

**Working Notes :**

(1) Percentage change in EBIT $= \dfrac{\text{Difference in EBIT}}{\text{Base year EBIT}} = \dfrac{Rs.15,000}{Rs.60,000} \times 100 = 25\%$

(2) Percentage change in sales $= \dfrac{\text{Differences in sales}}{\text{Base year sales}}$

$$= \frac{Rs.50,000}{Rs.200,000} \times 100 = 25\%.$$

**5. Calculate Degree of operating leverage.**

| Particulars | At 5,000 units | At 6,000 units |
|---|---|---|
| Sales | Rs. 100,000 | Rs. 1,20,000 |
| EBIT | Rs. – 10,000 | Rs. 4000 |

*Sol :*

**Calculation of Degree of Operating leverage.**

$$\text{DOL} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

$$\text{DOL} = \frac{-140\%}{20\%} \quad \therefore \ \text{DOL} = -7.$$

**Note :**

1) Percentage change in EBIT $= \dfrac{\text{Differences in EBIT}}{\text{Base year EBIT}}$

$$= \frac{\text{Rs.}14{,}000}{\text{Rs.}-10{,}000} \times 100 = -140\%$$

2) Percentage change in sales $= \dfrac{\text{Differences in sales}}{\text{Base year sales}} \times 100 = \dfrac{Rs.\ 20{,}000}{Rs.100{,}000} \times 100 = 20\%.$

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**6. The total sales of a company are ` 7,00,000. Unit selling price is ` 10 and variable cost per unit is ` 7. Total fixed costs amount to ` 1,70,000. The company finances its assets to an extend of 50% by debt, and the interest on the debt amounts to ` 20,000. The applicable tax rate for the company is 35%.**

**Calculate the financial, operating and combined leverage of the company.**

*Sol :* **(Sept.-16)**

**Calculation of Operating Leverage**

| Particulars | ` |
|---|---|
| Sales level (Working notes) | |
| Sales | 7,00,000 |
| **Less :** Variable cost(70,000 × 7) | 4,90,000 |
| Contribution | 2,10,000 |
| **Less :** Fixed cost | 1,70,000 |
| Operating Profit (EBIT) | 40,000 |

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \quad \frac{2{,}10{,}000}{40{,}000}$$

$$= 5.25$$

**Calculation of Financial Leverage**

| Particulars | ` |
|---|---|
| EBIT | 40,000 |
| **Less :** Interest on debt | 20,000 |
| Profit before tax (PBT) | 20,000 |

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} \quad \frac{40{,}000}{20{,}000} = 2$$

**Calculation of Combined Leverage**

Combined Leverage = Operating Leverage × Financial Leverage

= 5.25 × 2

= 10.50

**Working Notes**

$$\text{Total selling unit} = \frac{7,00,000}{10}$$

= 70,000 units

## 3.5 EBIT-EPS Analysis

**Q15. (a) What is EBIT-EPS Analysis ?**

**(b) Derive the relationship between EBIT-EPS Analysis.**

*Ans :* **(Aug.-17)**

**(a) EBIT-EPS Analysis**

Whenever, the company makes use of debt even though EBIT remain constant, EPS changes. It can be understood through EBIT -EPS analysis. But at certain levels of EBIT, the use of debt do not show any impact on EPS, at this point the EPS remains same whether the company makes use of debt or not. The point is known as "indifference point."

**(b) Relationship between EBIT-EPS Analysis**

The Concept of Earning Before Interest and Tax (EBIT) and Earning Per Share (EPS) are closely related with each other. These two concepts are very essential and helpful in designing capital structure of an organization, because analyzing the effect on EPS due to the changes made in EBIT is the first thing which needs to be understand in deciding the appropriate capital structure i.e., which type of financing is advantageous like debt financing or equity financing etc. The relationship between EBIT and EPS of an organization can be expressed as,

$$\boxed{EPS = \frac{(EBIT - i)(i - T) - P}{n}}$$

Where,

EPS = Earning Per Share

EBIT = Earning Before Interest and Tax

i = Interest Rate

T = Tax Rate

P = Preference Dividend

n = Number of shares of common stock outstanding.

### 3.5.1 Indifference Point/Break Even Analysis of Financial Leverage

**Q16. Explain in detail Indifference Point/Break Even Analysis of Financial Leverage.**

**(OR)**

**What is the indifference point in the EBIT-EPS analysis ? How would you compare it ?**

*Ans :* **(Dec.-19, Feb.-12)**

Indifference point indicates the level of EBIT at which the EPS is same for two different financial plans. The indifference point is defined as the level of EBIT above which benefits of financial leverage starts functioning with respect to Earnings Per Share (EPS).

The indifference point between two alternative methods of financing is calculated by two methods. They are :

1. Algebraic approach
2. Graphic approach

**1. Algebraic approach**

This is a thematic approach in which the indifference point can be computed with the help of follow :

**In Case of New Company**

(i) Equity shares Vs Debentures

$$\frac{X(1-t)}{N_1} = \frac{(X-1)(1-t)}{N_2}$$

(ii) (a) Equity shares Vs preferences shares,

$$\frac{X(1-t)}{N_1} = \frac{X(1-t)-P}{N_3}$$

(b) Equity shares Vs Preference shares with tax on preference dividend.

$$\frac{X(1-t)}{N_1} = \frac{X(1-t)-P(1+D_1)}{N_3}$$

(iii) Equity shares Vs preference shares and debentures

$$\frac{X(1-t)}{N_1} = \frac{(X-1)(1-t)-P}{N_4}$$

**In Case of Existing Company**

$$\frac{(X-I_1)(1-t)}{N_1} = \frac{(X-I_1-I_2)(1-t)}{N_2}$$

Where,

X = EBIT at the indifference point.

$N_1$ = Number of equity shares outstanding, if only equity shares are issued.

$N_2$ = Number of equity shares outstanding, if both debentures and equity shares are issued.

$N_3$ = Number of equity shares outstandingly, if both preference and equity shares are issued.

$N_4$ = Number of equity shares outstanding, if both preference shares and debentures are issued.

I = The amount of interest on debentures.

P = Dividend on preference shares.

t = Income-tax rate.

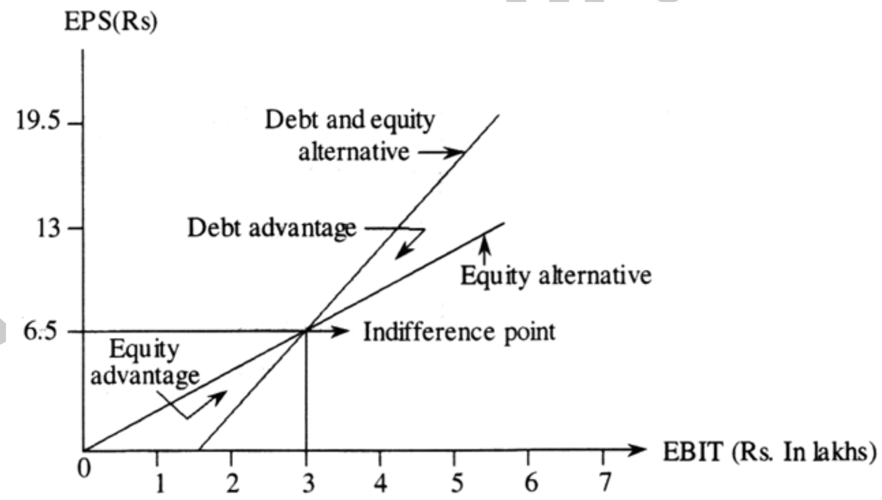
$D_t$ = Tax on preference dividend.

$I_1$ = Interest paid on existing debt.

$I_2$ = Interest paid on additional debt.

## 2. Graphic Approach

The indifference point can be ascertain with the help of graphic approach. EBIT is taken on X-axis, whereas EPS is taken on Y-axis. The point of intersection of lines is the indifference point. It can be graphically obtained by plotting the relationship between EBIT and EPS under the two alternatives and noting the point of intersection i.e., indifference point.




Alternatively, indifference point is calculated on the basis of market value. The level of EBIT ensures the market price for two different plans as same and the indifference point is calculated as,

$$P/E_1\left[\frac{X(1-t)}{N_1}\right] = P/E_2\left[\frac{(X-1)(1-t)-D_p}{N_2}\right]$$

Where,

$P/E_1$ = P/E ratio of unlevered plan

$P/E_2$ = P/E ratio of levered plan.

## Problems on EBIT EPS Analysis

**7. A ltd. who has an EBIT of Rs. 1,60,000/- capital structure consist of 10% debentures of Rs. 5,00,000/-, equity shares of 4,00,000/- (Rs. 100 each), 12% preference shares of Rs. 1,00,000/-. The tax rate is 55% calculate (i) EPS, (ii) DFL, (iii) % change in EPS associate with 30% increase & 30% decrease in EBIT ?**

*Sol. :*

| Particulars | Amount |
|---|---|
| EBIT | 1,60,000 |
| (–) Interest | |
| (5,00,000 × 10%) | 50,000 |
| EBT | 1,10,000 |
| (–) Tax @ 55% | 60,500 |
| EAT / PAT | 49,500 |
| (–) Preference Dividend | |
| (1,00,000 × 12%) | 12,000 |
| EAES | 37,500 |
| (tarning Available to Equity Shareholders) | 37,500 |

$$\text{No. of Equity Shares} = \frac{4,00,000}{100}$$

$$= 4000 \text{ shares}$$

(i) $$\text{EPS} = \frac{\text{EAES}}{\text{No. of eq. shares}} = \frac{37,500}{4000} = 9.375$$

(ii) $$\text{DFL} = \frac{\text{EBIT}}{\text{EBT}} = \frac{1,60,000}{1,10,000} = 1.45\%$$

(iii) Statement showing % change in EPS

| Particulars | 30% ↑ in EBIT | 30% ↓ in EBIT |
|---|---|---|
| EBIT | 2,08,000 (1,60,000 + 30%) | 1,12,000 (1,60,000–48,000) |
| | = (1,60,000 + 48,000) | |
| (–) Interest @ 10% | 50,000 | 50,000 |
| EBT | 1,58,000 | 62,000 |
| (–) Tax @ 55% | 86,900 | 34,100 |
| EAT | 71,100 | 27,900 |
| (–) Preference Dividend | 12,000 | 12,000 |
| EAES | 59,100 | 15,900 |

(i) $EPS = \dfrac{EAES}{\text{No. of Equity Shares}} = \dfrac{59,100}{4,000} = 14.775$

(ii) $EPS = \dfrac{EAES}{\text{No. of Equity Shares}} = \dfrac{15,900}{4,000} = 3.975$

$\boxed{\%\text{ change in EPS} = \dfrac{\Delta EPS}{EPS}}$

**Actual EPS** **↑ in 30% EPS** **↓ in 30% EPS**

$\therefore$ EPS = 9.375 $\therefore$ EPS = 14.775 $\therefore$ EPS = 3.975

% Change in EPS $\dfrac{\Delta EPS}{EPS} = \dfrac{14.775 - 9.375}{9.375} = \dfrac{3.975 - 9.375}{9.375}$

$\therefore$ 0.576 = 0.576

**8. XYZ Co. is having an EBIT of Rs. 2,00,000/-. The capital structure consist of 10% debentures of Rs. 5,00,000/-, equity shares of Rs. 2,00,000/- (50 Rs. each), 10% pref. shares of Rs. 1,00,000/-, tax rate is 50%. Calculate (i) EPS, (ii) DFL, (iii) % change in EPS associated with 15% ↑ and 15% ↓ in EBIT.**

*Sol. :*

**Calculation of Number of Equity Shares**

$\dfrac{2,00,000}{50} = 4,000$ shares

| **Particular** | **Amount** |
|---|---|
| EBIT | 2,00,000 |
| (–) Interest @ 10% | 50,000 |
| EBT | 1,50,000 |
| (–) Tax @ 50% | 75,000 |
| EAT | 75,000 |
| (–) Preferece Dividend @ 10% | 10,000 |
| EAES | 65,000 |

i) $EPS = \dfrac{EAES}{\text{No. of equity shares}} = \dfrac{65,000}{4,000} = 16.25.$

ii) $DFL = \dfrac{EBIT}{EBT} = \dfrac{2,00,000}{1,50,000} = 1.33\%$

iii) % Change in EPS

| Particulars | 15% ↑ | 15% ↓ |
|---|---|---|
| EBIT | 2,30,000 (2,00,000 + 30,000) | 1,70,000 |
| (–) Interest @ 10% | 50,000 | 50,000 |
| EBIT | 1,80,000 | 1,20,000 |
| (–) Tax @ 50% | 90,000 | 60,000 |
| EAT | 90,000 | 60,000 |
| (–) Preference dividend @ 10% | 10,000 | 10,000 |
| EAES | 80,000 | 50,000 |

$$\therefore \text{ EPS } = \frac{\text{EAES}}{\text{No. of shares (eq.)}}$$

$$= \frac{80,000}{4,000} = 20$$

$$\therefore \text{ EPS } = \frac{\text{EAES}}{\text{No. of shares (eq.)}}$$

$$= \frac{50,000}{4,000} = 12.5$$

$$\boxed{\text{\% change in EPS} = \frac{\Delta\text{EPS}}{\text{EPS}}}$$

$$= \uparrow \text{ in 15\%} \quad = \frac{20-16.25}{16.25} = 0.23$$

$$= \downarrow \text{ in 15\%} \quad = \frac{12.5-16.25}{16.25} = -0.230$$

**9. International Ltd., has a capital structure (all equity) comparisons Rs. 5,00,000 each share of Rs. 10. The firm wants to raise an additional Rs. 2,50,000 for expansion programme. The firm has four alternative financial plans I, II, III and IV. If the firm is able to earn an operating profit at Rs. 80,000 after additional investment and 50 per cent tax rate. Calculate EPS for all four alternatives and select the preferable financial plan. Financial plans**

**I. Raise the entire amount by issue of new equity capital.**

**II. Raise 50 per cent as equity capital and 50 per cent as 10 per cent debt capital.**

**III. Raise the entire amount as 12 per cent debentures.**

**IV. Raise 50 per cent equity capital and 50 per cent preference share capital at 10 percent.**

*Sol :*

**Calculation of EPS under four Financial Plans**

| Particulars | Financial Plan I Rs. | II Rs. | III Rs. | IV Rs. |
|---|---|---|---|---|
| EBIT | 80,000 | 80,000 | 80,000 | 80,000 |
| Less: Interest | ----- | 12,500 | 30,000 | ---- |
| EBT | 80,000 | 67,500 | 50,000 | 80,000 |
| Less: Tax 50% | 40,000 | 33,750 | 25,000 | 40,000 |
| EAT | 40,000 | 33,750 | 25,000 | 40,000 |
| **Less:** Preference dividend | ----- | ----- | ----- | 12,500 |
| Earnings available to shareholders | 40,000 | 33,750 | 25,000 | 27,500 |
| No. of shares (equity) outstanding | 75,000 | 62,500 | 50,000 | 62,500 |
| EPS (Rs.) | 0.53 | 0.54 | 0.50 | 0.44 |

Financial Plan II is preferable since EPS in that plan is high when compared to other.

**10. Techno Manpower Ltd. expecting EBIT of Rs. 5,00,000 per annum on investment of Rs.10,00,000. Company is in need of Rs.8,00,000 for its expansion activities. Company can raise this amount by either equity shares capital or 12% preference share capital or 10% debentures. The company is considering the following financing patterns. :**

**(a) 10,00,000 through issues of Equity Shares at par;**

**(b) 5,00,000 by issue of Equity Share Capital and remaining 5,00,000 by issue of debentures;**

**(c) 5,00,000 through Equity Shares and 2,50,000 through 12% Preference Share Capital and remaining 2,50,000 through 10% debentures.**

**(d) 5,00,000 through debt and 2,50,000 through Equity Shares and remaining 2,50,000 through 12% preference Share Capital.**

**Find out the best financing mix assuming 50% tax rate.**

*Sol :* **(July-18)**

**Calculation of EPS**

| Particular | Plan I equity | Plan II 50% E + 50%D | Plan III 50% E+ 25%D + 25% | Plan IV 50% D+ 25%E + 25% PS |
|---|---|---|---|---|
| E B I T | 5,00,000 | 5,00,000 | 5,00,000 | 5,.00,000 |
| (–) Interest | NIL | 50,000 | 25,000 | 50,000 |
| Profit before tax | 5,00,000 | 4,50,000 | 4,75,000 | 4,50,000 |
| (–) Incometax @ 50% | 2,50,000 | 2,25,000 | 2,37,500 | 2,25,000 |
| PAT | 2,50,000 | 2,25,000 | 2,37,500 | 2,25,000 |
| (–) Preference dividend | | 60,000 | 30,000 | 30,000 |
| Number of equity share | 2,50,000 | 1,90,000 | 2,07,500 | 1,95,000 |
| EPS | – | – | – | – |

EPS can be calculated only when information on par value of share is given. In this problem. PAR values has not been given information is insufficient.

**11. The well-established company's most recent balance sheet is as follows**

| Liabilities | Amount | Assets | Amount |
|---|---|---|---|
| Equity Capital (Rs. 10 per sheet) | Rs. 6,00,000 | Net fixed assets | Rs. 15,00,000 |
| 10% Loan-term debt | Rs. 8,00,000 | Current assets | Rs. 5,00,000 |
| Retained earnings | Rs. 2,00,000 | | |
| Current liabilities | Rs. 4,00,000 | | |
| Total | Rs. 20,00,000 | Total | 20,00,000 |

The company's total assets turnover ratio is 3, its fixed operating costs are Rs. 10,00,000 and the variable costs ratio is 40 percent. The income tax rate is 35 percent.

(a) Calculate all the three types of leverages.

(b) Determine the likely level of EBIT if EPS is (i) Rs. 1 (ii) Rs. 3 and (iii) Zero

*Sol :* **(Dec.-19)**

**Calculation of 3 types of Leverages**

**Income Statement**

| Particulars | Amount |
|---|---|
| Sales | 60,00,000 |
| (–) Variable cost | 24,00,000 |
| Contribution | 36,00,000 |
| (–) Fixed cost | 10,00,000 |
| EBIT | 26,00,000 |
| (–) Interest | 8,00,000 |
| EBT | 18,00,000 |
| (–) Taxes | 6,30,000 |
| EAT | 11,70,000 |

**Working Notes**

1. Gives assets turnover Ratio = 3

$$\text{Total Asset turnover ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$3 + \frac{\text{Net Sales}}{\text{Total Assets}} = \text{Net sales} = 3 \times 20{,}00{,}000$$

$$\text{Net sales} = 60{,}00{,}000$$

2. Variable cost 40% of sales = 40% of 60,00,000
= 24,00,000

3. Interest = 10% of 8,00,000 (long term debt).
Interest = 80,000

4. Taxes = 35% of EBT = 35% of 18,00,000
= 6,30,000

**(a) Calculation of Leverage**

1. Operating Leverages = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{36,00,000}{26,00,000}$ = 1.3846

Operating leverage = 1.3846

2. Financial leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{26,00,000}{18,00,000}$ = 1.444.

3. Combined leverage = OL × FL = 1.3846 × 1.444
Combined leverage = 1.999

(b) EPS = $\frac{(\text{EBIT} - \text{Interest})(1-t)}{N}$

N = $\frac{\text{Equity Capital}}{\text{Share Price}} = \frac{6,00,000}{10}$ = 60,000 shares

(i) If EPs is ` 1/- then EBIT is

$$1 = \frac{[\text{EBIT} - 8,00,000]\, 0.65}{60,000}$$

60,000 = (EBIT = 8,00,000) 0.65
60,000 = 0.65 = EBIT – 5,20,000
⇒ 60,000 + 5,20,000 = 0.65 EBIT

EBIT = $\frac{5,80,000}{0.65}$ = 8,92,308.

(ii) If EPS to ` 3/- there EBIT is

$$3 = \frac{(\text{EBIT} - 8,00,000)(1-0.35)}{60,000}$$

1,80,000 = (EBIT – 8,00,000) 0.65
1,80,000 = 0.65 EBIT – 5,20,000
⇒ 1,80,000 + 5,20,000 = 0.65 EBIT

$\therefore \frac{7,00,000}{0.65}$

EBIT = 10,76,923

(iii) IF EPS is zero - Then EBIT is

$$0 = \frac{(\text{EBIT} - 80,000)(1 - 0.35)}{60,000}$$

$0 = 0.65$ (EBIT – 8,00,000) 0.65

$0 = 0.65$ EBIT – 5,20,000

$\Rightarrow$ 0 + 5,20,000 = 0.65 EBIT

$$\text{EBIT} = \frac{5,00,000}{0.65} = 8,00,000$$

**12. A Steel Company has an EBIT of ` 1,50,000. Its Capital Structure is as follows :**

| **Particulars** | **`** |
|---|---|
| **10% Bonds** | **4,00,000** |
| **12% Preference Capital** | **2,00,000** |
| **Equity Capital (FV : ` 100)** | **4,00,000** |

**Note : The Co. is in 35% Tax bracket.**

**Find : (a) The EPS of the firm**

**(b) The % change in EPS associated with 20% increase in EBIT.**

*Sol :* **(Aug.-17)**

**Computation of Earning Per Share [EPS]**

| | **Particulars** | **Base** | **20% Increase** |
|---|---|---|---|
| | EBIT | 1,50,000 | 1,80,000 [1,50,000 × 120%] |
| **Less :** | Interest on Bonds @ 10% [4,00,000 × 10%] | 40,000 | 40,000 |
| | EBT | 1,10,000 | 1,40,000 |
| **Less :** | Tax @ 35% | 38,500 | 49,000 |
| | **Earnings after Interest and Tax** | 71,500 | 91,000 |
| **Less :** | Dividend on Preference Shares @ 12%[2,00,000 × 12%] | 24,000 | 24,000 |
| | Earnings available for equity shareholder | **47,500** | **67,000** |
| | Number of Equity Shares = $\frac{4,00,000}{100}$ | 4,000 | 4,000 |
| (a) | EPS = $\frac{\text{Earning for Equity Shareholders}}{\text{Number of Equity Shares}}$ | 11.875 $\left[\frac{47,500}{4,000}\right]$ | 16.75 $\left[\frac{67,000}{4,000}\right]$ |
| (b) | 20% increase in EBIT $\left[\frac{16.75 - 11.875}{11.875}\right] \times 100$ | – | 41.053% |

$\therefore$ With increase of 20% in EBIT, there is 41.053% of increase in EPS.

## 3.6 Capital Structure Theories

**Q17. Explain different types of Capital Structure Theories.**

*Ans :*

There are different views on how capital structure influences the value of the firm. Some argued that other things being equal, increase in financial leverage (debt) increases the value of the firm [Relevant Theory] few others opine that there is no relationship between capital structure and value of the firm [Irrelevant theory] and some others believe that use of debt in capital structure has a positive effect on the value of the firm upto a certain level and have negative effect thereafter (neutral theory).

The total capital structure theories can be categorized into two: Relevant and Irrelevant theories.

The following are the main theories/ Approaches of capital structure:

1. Net income (theory) Approach (Relevant)
2. Net operating income Approach (Irrelevant)
3. Modigliani and Miller Approach (Irrelevant)
4. Traditional Approach (Neutral)

**Q18. State the various Assumptions of Capital Structure.**

*Ans :*

To study the relationship between capital structures (use of debt) and value of the firm, the following assumptions are generally made :

(i) Firm uses only two sources of funds: perpetual riskless debt and equity;

(ii) There are no corporate or income or personal tax;

(iii) The dividend payout ratio is 100% [There are no retained earnings];

(iv) The firm's total assets are given and do not change [Investment decision is assumed to be constant],

(v) The firm's total financing remains constant. [Total capital is the same, but proportion of debt and equity may be changed];

(vi) The firm's operating profits (EBIT) are not expected to grow;

(vii) The business risk remains constant and is independent of capital structure and financial risk;

(viii) All investors have the same subjective probability distribution of the expected EBIT for a given firm; and

(ix) The firm has perpetual life.

### 3.6.1 The Modigliani Miller Theory

**Q19. Explain briefly about Modigliani-Miller Approach (MM Hypothesis).**

*Ans :*

This approach was developed by Professor, Franco Modigliani and Merton Miller. [MM, hereafter) in their classic contribution on capital structure, which has been called the most influential finance article ever written, who later became Nobel Laureates in economics.

MM Approach is identical to the NOI approach. In other words, the total value of the firm is independent of its capital structure. However, there is a basic difference between NOI and MM approach. The NOI approach is purely definitional, which does not provide operational justification for irrelevance of the capital structure in the valuation of the firm. On the other hand, MM approach supports the NOI approach in behavioural justification for the independence of the cost of capital and value of the firm at any level of degree of leverage. MM argues that, in the absence of taxes, firm's total market value and overall cost of capital remains constant to the change of debt capital proportion in capital structure. This has been proved by operational justification.

**Assumptions**

MM approach is based on the following assumptions:

(a) Information is available at free of cost

(b) The same information is available for all investors

(c) Securities are infinitely divisible

(d) Investors are free to buy or sell securities

(e) There is no transaction cost

(f) There are no bankruptcy costs

(g) Investors can borrow without restriction on the same terms on which a firm can borrow

(h) Dividend payout ratio is 100 per cent

(i) EBIT is not affected by the use of debt

**Q20. State the principle Propositions of MM Approach.**

*Ans :* **(March-16)**

**Basic Propositions :**

The propositions of MM approach are as follows:

**I. Based on the above listed assumptions, MM's first proposition is**

The overall cost of capital ($K_o$) and the value of the firm (V) are independent of capital structure. In other words, $K_o$ and V are constant for any proportion of debt-equity mix. The total value is given by capitalising the expected net operating income by the discount rate appropriate to its risk class. Symbolically:

$$V = s + D = NOI \div k_o$$

**II. The second proposition is**

Cost of equity capital ($k_e$) to capitalization rate of the pure equity plus a premium for the financial risk. Cost of equity ($k_e$) capital increases with use of more debt in capital structure. The increase in $k_e$ offsets exactly the use of a less expensive source of funds represented by debt.

**III. And the Third is**

The cut-off rate for investment purposes is completely independent of the way in which an investment is financed.

We discuss here proposition I only, because we need to see the relationship between leverage and valuation.

**Proposition I**

According to this proposition the total value of the firm must be constant for all degrees of leverage [debt-equity mix]. As a result, the Ko and market price of share is same, irrespective of what debt-equity may be.

MM proved the proposition I based on "arbitrage process". The following discussion explains the arbitrage process.

**Arbitrage Process**

The term 'arbitrage' refers to an act of buying an asset or security in one market at a lower price and selling it in another market at a higher price. As a result of such action [buying and selling] equilibrium is restored in the market price of an asset that is unequal in the markets. The arbitrage process involves purchase of assets or securities whose prices are lower [undervalued securities] and sale of assets of securities whose prices are high in market where prices are out of equilibrium. Arbitrage process is a balancing operation.

MM explains the arbitrage mechanism, by taking two firms which are exactly similar in all respects except (leverage) in their capital structures. One firm uses debt in its capital structure [Levered firm 'L'], while the other does not [unlevered firm UL] or completely financed by equity capital. Such homogenous firms are perfect substitutes. The value of the firm differs just because of leverage, but cannot be different (always) because of arbitrage process.

Investors of a firm whose share value is high will sell their shares and buy shares of the firm whose share value is low (under valued share). Investors will be able to earn some income at less investment and with the same risk [perceived risk], this is because the investors would borrow in the proportion of degree of leverage in the present firm. The use of debt in the arbitrage process by investors is called as "personal or home-made leverage". Use of personal leverage is based on of assumption that investors can borrow funds without any restriction on the same terms on which a firm can borrow. Investors will be able to substitute, by borrowing (debt) funds himself/herself.

The arbitrage process comes to an end when two identical firm's share price is equal. But practically the share prices of two identical firm? never become equal, hence there is no end for arbitrage process.

**Q21. Explain the Limitations of MM Approach.**

*Ans :*

As we have read above that arbitrage process provides operational justification to the MM approach. The arbitrage process depends on the perfect capital market assumptions. But all the assumptions are not realistic, so arbitrage process becomes only a theoretical approach.

- **Investor's inability to borrow funds on the same terms and conditions as** corporates can. General financial institutions put additional terms and conditions for sanctioning loan to an individual investor. Hence, it may not be possible to raise funds on same terms and conditions as firms can.

- **Personal leverage is not substitute for corporate leverage**

  MM approach assumes that personal leverage is a perfect substitute for corporate leverage. The perceived risk exposure in corporate leverage is less when compared to personal home made leverage, because the liability of investors is limited to the proportionate share holdings in case the company is forced to liquidate. On the other hand; the (risk) liability is unlimited in personal leverage, and his/her personal assets are liable to use for payment of personally borrowed funds. With these reasons personal leverage cannot be a substitute for corporate leverage, consequently the operation of arbitrage process will not be able to prove MM approach.

- **Existence of Transaction costs**

  The investor cannot buy and sell securities free of cost. There exists transaction costs. The effect of the existence of transaction costs, makes investors to (receive) realize less amount than the actual market value. It will lead to invest a large amount in order to earn same return.

- **Institutional Restrictions**

  Institutional restrictions do not allow the smooth operation of arbitrage process. Generally, institutional investors viz., insurance companies; mutual funds, commercial banks, etc., are not allowed to raise personal leverage. Hence, for this type of institutional investors, it will not be possible to switch from levered to unlevered firm and vice-versa.

- **Asymmetric Information**

  MM hypothesis assumes that the same information is available for all investors, that is not correct. But the manager of a firm knows more about a firm's operations and future prospects than investors do. It is known as asymmetric information. Generally, managers take decisions with a goal of maximizing the existing shareholders wealth, then asymmetric information can affect the capital structure decisions that the manager makes.

- **Existence of Corporate Tax**

  The approach assumes that there are no corporate taxes. But there are corporate taxes, if corporate tax is considered, MM approach will fail to explain the relationship between leverage and the total value of the firm. When there is tax, interest charges are allowed to be deducted before paying tax. It leads to the borrowing cost becoming less when compared to actual (contractual rate of interest).

  As a result, the return to equity shareholders of a levered firm is always higher than the unlevered firm. Thus, the total market value of a levered firm always exceeds the value of the unlevered firm, which will show that MM approach is a theoretical one and not a practical one.

### 3.6.2 Net Income (NI)

**Q22. Explain briefly about Net Income Approach.**

*Ans :* **(Dec.-18)**

This approach has been developed by Durand. It is a relevant theory. According to this approach, capital structure decision is relevant to the valuation of the firm. In other words, a change in debt proportion in capital structure will lead to a corresponding change in cost of capital ($K_o$) as well as total value of the firm.

**Assumptions**

Net income approach is based on the following assumptions :

i) There are no taxes;

ii) Cost of debt is less than the cost of equity;

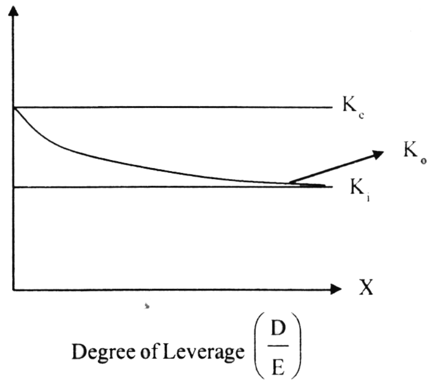
iii) Use of debt in capital structure does not change the risk perception of investors.

iv) Cost of debt and cost of equity remains constant;

NI approach argument based on the above three assumptions. Increase of debt (cheapest source of long-term finance) in capital structure reduces cost of capital ($K_o$), due to, which there is 10 change in the cost of equity [Risk perception of investors] leading to an increase in the total value of the firm.

When cost of debt (K) and cost of equity (K.) are constant, with the increased use of debt in he capital structure it will magnify the equity shareholder's earnings and thereby market value of he firm and equity shares. Value of the firm based on NI approach is as follows:

$$E = NI \div Ke$$




### 3.6.3 NOI Theory

**Q23. What do you understand by Net Operating Income (NOI) Approach?**

*Ans :* **(Dec.-18, Sep.-15)**

This is another approach, which has been suggested by Durand. It is just-opposite to the net income approach. According to this approach, the capital structure decisions of a firm are irrelevant. It says that any change in debt proportion in capital structure (leverage) will not lead to any change in the value of the capital ($K_0$). They (V, $K_0$ and share price) are independent of financial leverage.

**Assumptions**

NOI approach is based on the following assumptions:

(i) Overall Cost of Capital ($K_o$) remains unchanged for all degrees of leverage.

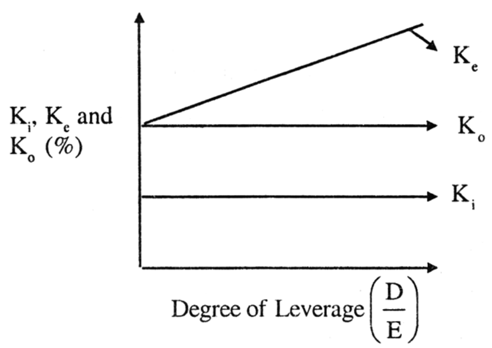



**Fig. : Effect of leverage on '$K_o$'**

(ii) The market capitalizes the total value of the firm as a whole and no importance is given for split of value of firm between debt and equity;

(iii) The market value of equity is residue [i.e., Total value of the firm minus market value of debt);

(iv) The use of debt funds increases the received risk of equity investors, thereby K. increases;

(v) The debt advantage is set off exactly by an increase in cost of equity;

(vi) Cost of debt (K.) remains constant;

(vii) There are no corporate taxes.

The total value of the firm according to NOI is calculated as follows :

$$V = EBIT \div K_o.$$

One of the assumptions says that market value of equity is residual. Symbolically:

$$E = V - D$$

**Optimum Capital Structure**

According to NOI approach, there is no optimum capital structure because the total value of the firm (V), market price of equity share and cost of capital ($K_o$) remains unaffected with the change in financial leverage (change in debt proportion)

### 3.6.4 Traditional Theory - A Critical Appraisal

**Q24. Explain the concept of Traditional Theory.**

*Ans :* **(Dec.-18)**

This traditional approach was given by Soloman. In the preceding approaches of capital structure we have discussed that the Net Income (NI) approach and Net Operating Income (NOI) approach requirements two extreme views with regard to the relation between leverage (use of debt) and value of the firm (cost of capital). According to the NI approach, use of debt in capital structure affects both cost of capital ($K_o$) and total value of the firm, on the other hand, NOI approach suggests that the use of debt in capital structure is irrelevant to the value of the firm and cost of capital. Another approach given by MM support the NOI approach, but validity of MM approach is doubtful due to the imperfect assumptions.

Traditional approach is the mid-way between the NI and NOI approaches. It is a compromise between the two approaches. It is also known as "Intermediate Approach". Traditional approach partly takes some features of NI approach and NOI approach.

Traditional approach is similar to NI approach in a way that cost of capital and value of the firm which are dependent of capital structure (that is leverage) affects the cost of capital and value of the firm. But it does not accept that the value of the firm will necessarily increase for all degrees of leverage.

Traditional approach supports the view of NOI approach, that beyond a certain degree of leverages the overall cost of capital increases, leading to decrease in the total value of the firm.

But it differs from NOI approaches in the sense that the overall cost of capital will not remain stable for all degrees of leverages.

Traditional approach views that judicious use of debt-equity mix helps to increase the firm's total value and reduce the overall cost of capital. The rational behind this view is that debt is relatively cheaper [due to tax benefit] source of long-term fund when compared to raising funds by issue of equity shares. In other words, the overall cost of capital ($K_o$) will decrease with the use of debt.

**Main Propositions**

The following three are the main propositions of traditional approach

1. The pre-tax cost of debt ($K_i$) remains more or less constant upto a certain degree of leverage and /but rises thereafter at an increasing rate,

2. The cost of equity capital ($K_e$) remains more or less constant rises slightly upto a certain degree of leverage and rises sharper thereafter, due to increased perceived risk,

3. The overall cost of capital ($K_o$), as a result of the behaviour of pre-tax cost of debt ($K_i$) and cost of equity ($K_e$) behaves in the following manner:

(a) Decreases upto a certain point level of degree of leverage [stage I increasing firm value];

(b) Remains more or less unchanged for moderate increase in leverage thereafter [stage II optimum value of firm], and

(c) Rises sharply beyond certain degree of leverage [stage III decline in firm value].

The above three propositions suggest that the cost of capital ($K_q$) is dependent on capital structure. It declines with leverage [in stage I] upto a certain point, increases moderately with moderate increase in leverage [stage II], and increases sharply beyond a safe point [stage III]. The relationship between leverage and cost of capital (K ) is shown in figure below.

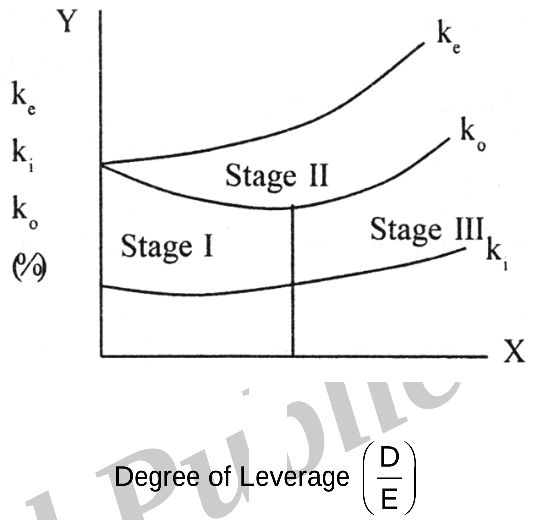



**Fig. : Relationship between Leverage and Cost of Capital**

The above figure (Traditional Approach) suggests that there is a range of capital structure in which the cost of capital ($K_o$) is the minimum and the value of the firm is maximum. There are many variations of the traditional approach, but all the supporters of the traditional approach agree that the cost of capital declines and value of firm increases with use of debt in capital structure.

## Problems on Capital Structure Theories

**13. The following information is available about a company,**

| Particulars | Amount |
|---|---|
| **Net operating income** | **` 15 million** |
| **Tax rate** | **50%** |
| **Debt. capital** | **` 20 million** |
| **Interest rate on debt.** | **10%** |
| **Capitalization rate applicable to debt free firm in the risk class to which this companry belongs** | **12%** |

**What should be the value of the company according to Modigliani and Miller?**

*Sol :* **(Mar.-16)**

According to Modigliani and Miller,

$$\text{Value of the firm} = \frac{\text{Expected operating income}}{\text{Discount rate/capitalization rate applicable to the risk class to which the company belongs}}$$

Given,

Net operating income = 15 million

Capitalization rate applicable to the risk class to which the company belongs = 12%

$$V = \frac{15}{0.12}$$

= ` 125 million.

**14. ABC Pharma Ltd. has ` 50 crore of debt carrying an interest of 12 percent. Its EBIT is ` 15 crore. ABC Pharma Limited's shareholders require a return of 20 percent. What is the average cost capital of ABC Pharma Ltd., under the net income approach?**

*Sol :* **(Sept.-15)**

| Particulars | Amount |
|---|---|
| Net Income (EBIT) | 15,00,00,000 |
| **Less :** Interest on 12% debentures of ` 50 crores | 6,00,00,000 |
| Earnings available to equity shareholders | 9,00,00,000 |
| Market capitalization rate or cost or equity | 20% |
| Market value of equity (S) $= \left(9,00,000 \times \frac{100}{20}\right)$ or $\left(\frac{9,00,000}{0.20}\right)$ $\left[\therefore S = \frac{NI}{K_e}\right]$ | 45,00,00,000 |
| Market value of debentures (D) | 50,00,00,000 |
| Value of the firm (S + D) | 95,00,00,000 |

**Calculation of Operating Leverage**

$$K_A = K_d\left[\frac{D}{D+S}\right] + K_e\left[\frac{S}{D+S}\right]$$

$$= 0.12\left[\frac{50,00,00,000}{50,00,00,000+45,00,00,000}\right] + 0.20\left[\frac{45,00,00,000}{50,00,00,000+45,00,00,000}\right]$$

$$= 0.12\left[\frac{50,00,00,000}{95,00,00,000}\right] + 0.20\left[\frac{45,00,00,000}{95,00,00,000}\right]$$

$$= 0.12\ (0.526) + 0.20(0.474)$$

$= 0.06312 + 0.0948$

$= 0.1579$ or 15.79%

(or)

$$\text{Average cost capital } (k_A) = \frac{EBIT}{V}$$

$$= \frac{15,00,00,000}{95,00,00,000}$$

$= 0.1579$

(or)

15.79%

$\therefore$ The average cost of capital ($k_A$) is 15.79%

**15. The EBIT of firm A is ` 2,25,000. Interest on debt in respect of firm A is ` 75,000 (@15% PA). EBIT of firm B is also ` 2,25,000. Equity Capitalization rate and tax rates are 20% and 35% respectively, for both the firms. Which of the two firms has optimal capital structure under Net Operating Income approach?**

*Sol :* **(Aug./Sept.-16)**

**Calculating Value of Unlevered Firm B**

$$V_B = \frac{EBIT}{K_e}(1 - t)$$

$$= \frac{2,25,000(1-0.35)}{0.20}$$

$$= \frac{2,25,000(0.65)}{0.20}$$

$=$ ` 7,31,250

**Calculating Value of levered Firm A**

$V_A = V_B + t \times \text{Debt}$

$= 7,31,250 + 0.35 \times 5,00,000$

$= 7,31,250 + 1,75,000$

$=$ ` 9,06,250

**Conclusion**

According to net operating approach, firm A has optimal capital structure as it is having higher total value than the value of firm B.

**Working Notes**

$$\text{Debt} = 75,000 \times \frac{100}{15} = \text{` } 5,00,000$$

## 3.7 Dividend Decisions

**Q25. Define Dividend. Explain the importance of Dividend.**

*Ans :*

Dividend is explained as that portion of profits which is allocated to the shareholders of the company. It may be defined as the return that a shareholder gets from the company, out of its profits on his shareholdings.

**Definition**

**According to the Institute of Chartered Accountants of India,** dividend is "a distribution to shareholder out of profits or reserves available for this purpose".

**Importance of Dividend Policy**

The dividend policy is prepared to identify the amount of profits that is distributed to shareholders as dividend and the amount to be retained in the firm. Dividend policy decision is one of the most critical decisions of financial management.

Retained earnings are important because they enhance the growth of the firm, whereas dividends are essential for shareholders because they increase their current earnings.

Dividend policy of a firm influence long-term financing as well as wealth of shareholders. Hence, firm must make an appropriate dividend decision so that a reasonable amount of dividend is distributed and a sufficient amount is retained with the firm for its expansion and existence. There is an inverse relationship between dividends and retained earnings. When firm distributes large amount of profits as dividends then there will be less amount of retained earnings and vice versa.

**There are two types of theories in dividend policy,**

1. **Theory of irrelevance -** Which believes that dividend decision does not have any impact on shareholder's wealth and the valuation of the firm.

2. **Theory of relevance -** Which believes that dividend decision substantially has an impact on shareholder's wealth and valuation of firm.

### 3.7.1 Relevance of Dividends

**Q26. Explain Relevance theories of Dividends.**

*Ans :* **(Aug.-17)**

According to them dividends communicate information to the investors about the firms' profitability and dividend decision becomes relevant. Those firms which pay higher dividends, will have filter value as compared to those which do not pay dividends or have a lower dividend pay out ratio. We have examined below two theories representing this notion:

i) Walter's Approach, and

ii) Gordon's Approach

#### 3.7.1.1 Walter's Approach

**Q27. Explain briefly about Walter's Model.**

**(OR)**

**Discuss about Walter's Model.**

*Ans :* **(July-18, Aug.-17)**

Walter's model believes that dividends are relevant because dividends influence the value of the firm. According to Walter, firm cannot be isolated from its dividend policy because they are associated with each other.

The Walter's model is supported by important statements like there exists a relationship between internal rate of return (r) and cost of capital (k) which influence an optimum dividend policy of a firm. When internal rate of return is more than the cost of capital ($r > k$) then firm must preserve its earnings and when internal rate of return is less than cost of capital ($r < k$) then firm must distribute its earnings to shareholders as dividends. In the situation when $r > k$, the optimum pay out will be zero which results in increase in the value of the shares. And when $r < k$, the firm distributes all its earnings and optimum pay out will be 100%.

**Assumptions**

1. Walter's model assumes that all the investments made by the firm are financed through retained earnings and not from any external sources of funds like debt or new equity.

2. It is assumed that business risk of the firm does not change which implies that internal rate of return and cost of capital remain constant.

3. It is assumed that firm is a going concern with perpetual life.

4. At the time of determining the value, earnings and dividends remains constant.

The formula for determining the market price of the share is,

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,

$P$ = Market price of share

$D$ = Dividend per share

$r$ = Internal rate of return

$K_e$ = Cost of capital

$E$ = Earnings per share.

**Example**

Earnings = 15 per share

Dividend paid = 5 per share

IRR = 30%

Cost of capital = 22%

What is the market price of the share ?

*Sol. :*

$$P = \frac{D + \frac{r}{k_e}(E - D)}{k_e}$$

$$P = \frac{5 + \frac{0.30}{0.22}(15 - 5)}{0.22}$$

$$= \frac{5 + 1.36\ (10)}{0.22}$$

$$= \frac{18.6}{0.22} = 84.54$$

**Criticism**

1. In Walter's model, all investments are financed through retained earnings which is possible only in all-equity firms.
2. The firm's cost of capital ($K_e$) remains constant is not acceptable. Since, pattern of financing changes, cost of capital also changes.
3. The internal rate of return remains constant is not possible in real world when investments of the firm increases, its internal rate of return changes.

### 3.7.1.2 Gordon's Approach

**Q28. Explain briefly about Gordon Model.**

**(OR)**

**Write about Gordon Model with assumptions ?**

*Ans :* **(July-18, Feb.-17)**

Gordon's model was developed by Myron Gordon. This model believes that dividends are relevant and dividend decision has an impact on firm value. Gardon supports Walter's model in analysis of relationship between dividend policy and valuation of firm. Gordon's model is based on following assumptions,

1. It is assumed that firm is an all-equity firm and all investments are financed through retained earnings.
2. It is assumed that firm has a perpetual life and there are no corporate taxes.
3. The cost of capital is constant and more than the growth rate.
4. The internal rate of return remains constant.
5. Firm decides a retention ratio and it remains constant.

According to Gordon's model, the market value of the share is equal to the current value of future dividends. It can be mathematically represented as,

$$P = \frac{E(1 - b)}{K_e - br}$$

Where,

P = Market price of the share

$K_e$ = Cost of capital

E = Earnings per share

b = Retention ratio

br = Growth rate

r = Earnings rate.

**Implications**

1. When internal rate of return exceeds cost of capital ($r > k$), then price of the share increases and the dividend payout ratio decreases.
2. When internal rate of return is same as cost of capital then dividend policy is not influenced and price of the share remains constant.
3. When internal rate of return is less than cost of capital ($r < k$) it leads to increase in both price of the share and also the dividend payout ratio.

**Example**

If earnings rate = 12%

Cost of capital = 8%

Value of share = Rs. 12 per share

If 60% is paid out as dividend.

Earnings per share = 0.12 × 12 = 1.44

b = retention ratio = 40%

$K_e$ = 8%

*Sol. :*

$$P = \frac{E(1-b)}{K_e - br}$$

$$= \frac{1.44\ (1-0.4)}{0.08-(0.04\times 0.12)}$$

$$= \frac{0.864}{0.032} = 27$$

The present value of share = ` 27.

**Limitations of Gordon Model**

1. This model is purely quantitative as it does not consider qualitative factors such as industry trends or trends in management strategy.
2. The Gordon growth model is highly sensitive to the inputs having an impact on growth rate.
3. If Gordon model is not used properly then it may generate misleading and irrational results. Due to the fact that value of dividends may becomes infinite when the growth rate converges on the discount rates.
4. This model is suitable only when growth rate is constant and if growth rate exceeds the required rate of return then Gordon model may not be suitable for the determination of value of dividends.
5. In Gordon model, calculations are based on the assumption that future dividends will grow at a constant rate forever.
6. This model is not suitable for rapidly growing industries which have less predictable dividend patterns.

### 3.7.2 Irrelevance Theory of Dividend

#### 3.7.2.1 MM Hypothesis

**Q29. Explain briefly about Modigliani-Miller approach.**

**(OR)**

**What are the assumptions and arguments used by Modigliani and Miller in support of the irrelevance of dividends ? Are dividends really irrelevant ? Discuss.**

*Ans :* **(Dec.-19, Dec.-18, Sep.-14)**

This theory states that dividend decision will not have any impact either on shareholder's wealth or share prices, as it is not related to valuation of the firm.

According to this theory, investors don't separate their dividends and capital gains. The main aim of investors is to yield more and more return in their investment.

In case, the company has profitable investment opportunities, it will retain the earnings to finance them, otherwise distribute them.

**The Modigilani - Miller Approach**

The Modigliani-Miller theorem forms the basis for modern thinking on capital structure. The basic theorem states that, in the absence of taxes, bankruptcy costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed. It does not matter if the firm's capital is raised by issuing stock or selling debt. It does not matter what the firm's dividend policy is. Therefore, the Modigliani-Miller theorem is also often called the capital structure irrelevance principle.

They opine "under conditions of perfect capital markets, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy its dividend policy may have no influence on the market price of the shares."

They argued that whatever increase in shareholders wealth results form dividend payment, will be exactly offset by the effect of raising additional capital. For instance if a company having investment opportunities can distribute all its earnings among the shareholders. Then it will raise the capital required from outside. This will result in increasing the number of shares, resulting in fall in the future earning per share. So, whatever a shareholder has gained a result of increased dividends may be neutralized completely on account of fall in the value of shares due to decline in the expected earnings per share.

**Assumptions of Modigilani - Miller Approach**

M.M. hypothesis is based on the following assumptions :

1. Capital markets are perfect. The conditions are (a) investors behave rationally, (b) information is freely available to them and (c) there are no floatation and transaction costs.
2. There are either no taxes or there are no differences in the tax rates applicable to capital gains and dividends.
3. The firm has a fixed investment policy.
4. Risk or uncertainty does exist. Investors are able to forecast future prices and dividends with certainty.

**Determination of market price of the share:**

According to M.M. hypothesis, the market value of a share in the beginning of the period is equal to the present value of dividends paid at the end of the period plus the market price of the share at the end of the period. It is shown in the following equation :

$$P_0 = \frac{D_1 + P_1}{(1+k_e)}$$

where,

$P_0$ = Present market price of a share

$k_e$ = cost of equity capital

$D_1$ = Dividend to be received at the end of period one

$P_1$ = Market price of a share at the end of period one

**Computation of number of new shares to be issued**

According to M.M. hypothesis, the investment plan of a company can be financed either by retained earnings or by issue of new shares or both. The number of new shares to be issued can be determined by the following formula :

$$m \times P_1 = I_1 - (X - nD_1)$$

Where,

m = number of new shares to be issued

$P_1$ = price at which new issue is to be made

$I_1$ = amount of investment required

X = net profit during the period

$nD_1$ = Total dividends paid during the period

**Criticism of M.M. Hypothesis**

1. M.M.hypotheses assumes that taxes do not exist, it is far from reality,. In practical life not only the shareholders has to pay tax but there are different rates of tax for capital gains and dividends. Capital gains are subject to a lower rate of tax as compared to dividends. The cost of internal financing will, therefore be cheaper as compared to cost of external financing. So, shareholders will favour a dividend policy with retention of earnings as against the payment of dividends on account of tax differential.
2. ***Floatation costs :*** A firm has always to pay floatation costs in term of under writing fee

and brokers commission whenever it wants to raise funds from outside. As a result of external financing is costlier than internal financing.

3. Shareholders prefer current income than future income. M.M states that both are equal.

4. Dividends have informational content, it is not considered by M.M.

## Problems on Dividend Decisions

**16. The earnings per share of company is Rs. 8 and the rate of capitalization applicable is 10%. The company has before it an option of adoption.**

**i) 50%**

**ii) 75% and**

**iii) 100% dividend payout ratio.**

**Compute the market price of the company's quoted shares as per Walter's model if it can earn a return of,**

**i) 15%**

**ii) 10% and**

**iii) 5% on its retained earnings.**

*Sol :*

According to the Walter's model,

$$P_0 = \frac{D + \frac{r}{k_e}(E - D)}{k_e}$$

| Rate of Return | Dividend Payout Ratio 50% | 75% | 100% |
|---|---|---|---|
| 15% | $\frac{4+\frac{0.15}{0.10}(8-4)}{0.10} = 100$ | $\frac{6+\frac{0.15}{0.10}(8-6)}{0.10} = 90$ | $\frac{8+\frac{0.15}{0.10}(8-8)}{0.10} = 80$ |
| 10% | $\frac{4+\frac{0.10}{0.10}(8-4)}{0.10} = 80$ | $\frac{6+\frac{0.10}{0.10}(8-6)}{0.10} = 80$ | $\frac{8+\frac{0.10}{0.10}(8-8)}{0.10} = 80$ |
| 5% | $\frac{4+\frac{0.05}{0.10}(8-4)}{0.10} = 60$ | $\frac{6+\frac{0.05}{0.10}(8-6)}{0.10} = 70$ | $\frac{8+\frac{0.05}{0.10}(8-8)}{0.10} = 80$ |

**Working Notes :**

**Calculation of Dividend**

(a) When Rate of return 50%

EPS = 8

$$D = 8 \times \frac{50}{100} = 4$$

(b) When Rate of return 75%

EPS = 8

$$D = 8 \times \frac{75}{100} = 6$$

(c) When Rate of return 100%

EPS = 8

$$D = 8 \times \frac{100}{100} = 8$$

**17. The EPS of a company is 10 Rs. Market capitalization factor is 10%. The Co. has options of adapting payout of 20%, 40%, 80%. Using the walter formulae calculate market value of the share if the co's return on invest is (i) 8%, (ii) 10%, (iii) 20%.**

*Sol :*

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

EPS = 10 Rs.

$K_e$ = 10%

r = 8%, 10%, 20%

DPR = 20%, 40%, 80%

$\therefore$ $D_1 = 2$, $D_2 = 4$, $D_3 = 8$

$r_1 = 8\%$, $r_2 = 10\%$, $r_3 = 20\%$

$$\text{Div. payout ratio} = \frac{DPS}{EPS}$$

$$DPR = \frac{DPS}{EPS}$$

(i) DPS = EPS × DPR

$D_1 = 10 \times 20\% = 2$

(ii) $D_2 = 10 \times 40\% = 4$

(iii) $D_3 = 10 \times 80\% = 8$

(i) $r_1 = 8\%$, $D_1 = 2$

$$P = \frac{2 + \frac{0.08}{0.1}(10 - 2)}{0.1}$$

$$= \frac{2 + 6.4}{0.1} = \text{Rs. } 84$$

(ii) $r_2 = 10\%$ and D = 2

$$P = \frac{2 + \frac{0.1}{0.1}(10 - 2)}{0.1} = 100$$

(iii) $r_3 = 20\%$ and $D_1 = 2$

$$P = \frac{2 + \frac{0.2}{0.1}(10 - 2)}{0.1}$$

$$= \frac{2 + 16}{0.1} = 180$$

(iv) $r_1 = 8$, $D_1 = 4$

$$P = \frac{4 + \frac{0.08}{0.1}(10 - 4)}{0.1}$$

$$= \frac{4 + 4.8}{0.1} = 88$$

(v) $r_2 = 10\%$ and $D_2 = 4$

$$P = \frac{4 + \frac{0.1}{0.1}(10 - 4)}{0.1}$$

$$= \frac{4 + 6}{0.1} = 100$$

(vi) $r_3 = 20\%$ and $D_1 = 4$

$$P = \frac{4 + \frac{0.2}{0.1}(10 - 4)}{0.1}$$

$$= \frac{4 + 12}{0.1} = 160$$

(vii) $r_1 = 8,\ D_1 = 8$

$$P = \frac{8 + \frac{0.08}{0.1}(10-8)}{0.1}$$

$$= \frac{9.6}{0.1} = 96$$

(viii) $r_2 = 10\%$ and $D_2 = 8$

$$P = \frac{8 + \frac{0.1}{0.1}(10-8)}{0.1}$$

$$= \frac{8+2}{0.1} = 100$$

(ix) $r_3 = 20\%$ and $D_1 = 28$

$$P = \frac{8 + \frac{0.2}{0.1}(10-8)}{0.1}$$

$$= \frac{8+4}{0.1} = 120$$

| | $D_1$ | $D_2$ | $D_3$ |
|---|---|---|---|
| $r_1$ | 84 | 88 | 96 |
| $r_2$ | 100 | 100 | 100 |
| $r_3$ | 180 | 160 | 120 |

$r_1 = 8\%,\ K_e = 10\%$ $r < k$ = 100% dividend

$r_2 = 10\%,\ K_e = 10\%$ $r < k$ = share holder difference

$r_3 = 20\%,\ K_e = 10\%$ $r < k \rightarrow$ no dividend (0)

**18. A company has an EPS of Rs.15. The market rate of discount applicable to the company is 12.5%. Retained earnings can be reinvested at IRR of 10%. The company is paying out Rs.5 as a dividend. Calculate the market price of the share using Walter's model.**

*Sol :* **(July-18)**

Given

EPS = Rs. 15

Market rate of discount (k) = 12.5%

Retain earning (r) = 10%

Dividend payment = Rs. 5 per share

Walter formula calculated market price of share is given by

$$\boxed{P = \frac{D + \frac{r}{k_e}(E - D)}{k_e}}$$

$$P = \frac{5 + \frac{0.10}{0.125}(15 - 5)}{0.125} = \frac{5+8}{0.125} = \frac{13}{0.125}$$

$$= \text{Rs. } 104$$

**19. The following data relate to a firm; earnings per share ₹ 10, capitalization rate 10 percent, retention ratio 40 percent. Determine the price per share under Walter's and Gordon's model if the internal rate of return is 15 percent, 10 percent and 5 percent.**

*Sol :* **(Aug./Sept.-15)**

**According to Gordon's Model**

$$\boxed{P = \frac{E(1-b)}{K_e - b_r}}$$

Where,

E = Earning per share = ₹ 10

$K_e$ = Capitalization rate = 10%

r = Rate of return = 15%, 10% and 5%

b = Retention ratio (i.e., 1– payout ratio)

p = Price of shares

**(a) When retention ratio is 40% and internal rate of return is 15%**

i.e., r = 0.15 ($r > K_e$)

$$p = \frac{10(1-0.40)}{0.10-(0.40\times0.15)} = \frac{6}{0.10-0.06}$$

$$= \frac{6}{0.04} = ₹\ 150$$

**(b) When retention ratio is 40% and internal rate of return is 10%**

i.e., r = 0.10 ($r = K_e$)

$$p = \frac{10(1-0.40)}{0.10-(0.40\times0.10)} = \frac{6}{0.10-0.04}$$

$$= \frac{6}{0.06} = ₹\ 100$$

**(c) When retention ratio is 40% and internal rate of return is 5%**

i.e., r = 0.05 ($r < K_e$)

$$p = \frac{10(1-0.40)}{0.10-(0.40\times0.05)}$$

$$= \frac{6}{0.10-0.02}$$

$$= \frac{6}{0.08} = ₹\ 75$$

**According to Walter's Model,**

$$\boxed{P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}}$$

Where,

P = Market price per share

D = Dividend per share = 0

E = Earnings per share = ₹ 10

r = Rate of return = 15%, 10% and 5%

$K_e$ = Capitalization rate = 10%

**(a) When dividend payout ratio = 0**

r = 0.15 ($r > K_e$)

$$p = \frac{0 + \left(\frac{0.15}{0.10}\right)(10-0)}{0.10} = \frac{0+(1.5)(10)}{0.10}$$

$$= \frac{0+15}{0.10} = ₹150$$

**(b) When dividend payout ratio = 0,**

$r = 0.10\ (r = K_e)$

$$p = \frac{0+\left(\frac{0.10}{0.10}\right)(10-0)}{0.10} = \frac{0+1(10)}{0.10}$$

$$= \frac{10}{0.10} = ₹100$$

**(c) When dividend payout ratio = 0,**

$r = 0.05\ (r < K_e)$

$$p = \frac{0+\left(\frac{0.05}{0.10}\right)(10-0)}{0.10} = \frac{0+(0.5)(10)}{0.10}$$

$$= \frac{0+5}{0.10} = \frac{0+5}{0.10} = ₹\ 50$$

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**20. The equity capitalization rate is 11%. Earnings per share is ₹ 20/- Determine the values of the shares as per Gordon's Model, under conditions of certainty, when the rates of return on investment are 12% 11% and 10%, assuming the following**

**(a) 90% Retention**

**(b) 80% Retention and**

**(c) 50% Retention**

*Sol :* **(Aug./Sept.-16)**

According to Gordon's valuation model,

$$P_0 = \frac{E(1-b)}{K_e - br}$$

Where,

$P_0$ = Price of a share

E = Earnings per share

$K_e$ = Rate of return / required by share holder

b = Retention ration

r = Rate of return on investment

**(a) When retention ratio is 90%**

(i) $$P_0 = \frac{20(1-0.90)}{0.11-(0.90\times 0.12)} \qquad \boxed{\therefore r = 12\%}$$

$$= \frac{20(0.1)}{0.11-0.108}$$

$$= \frac{2}{0.002} = ₹1000$$

(ii) $$P_0 = \frac{20(1-0.90)}{0.11-(0.90\times 0.11)} \qquad \boxed{\therefore r = 11\%}$$

$$= \frac{20(0.1)}{0.11-0.099}$$

$$= \frac{2}{0.011}$$

$$= ₹\ 181.82$$

(iii) $$P_0 = \frac{20(1-0.90)}{0.11-(0.90\times 0.10)} \qquad \boxed{\therefore r = 10\%}$$

$$= \frac{20(0.10)}{0.11-0.09}$$

$$= \frac{2}{0.02}$$

$$= ₹\ 100$$

**(b) When retention ratio is 80%**

(i) $$P_0 = \frac{20(1-0.80)}{0.11-(0.80\times 0.12)} \qquad \boxed{\therefore r = 12\%}$$

$$= \frac{20(0.20)}{0.11-0.096}$$

$$= \frac{4}{0.014}$$

$$= ₹\ 285.71$$

(ii) $P_0 = \frac{20(1-0.80)}{0.11-(0.80\times0.11)}$ $\boxed{\therefore r = 11\%}$

$= \frac{20(0.20)}{0.11-0.088}$

$= \frac{4}{0.022}$

= ` 181.82

(iii) $P_0 = \frac{20(1-0.80)}{0.11-(0.80\times0.10)}$ $\boxed{\therefore r = 10\%}$

$= \frac{20(0.20)}{0.11-0.08}$

$= \frac{4}{0.03}$

= ` 133.33

**(c) When retention ratio is 50%**

(i) $P_0 = \frac{20(1-0.50)}{0.11-(0.50\times0.12)}$ $\boxed{\therefore r = 12\%}$

$= \frac{20(0.5)}{0.11-0.06}$

$= \frac{10}{0.05}$

= ` 200

(ii) $P_0 = \frac{20(1-0.50)}{0.11-(0.50\times0.11)}$ $\boxed{\therefore r = 11\%}$

$= \frac{20(0.5)}{0.11-0.055}$

$= \frac{10}{0.055}$

= ` 181.82

(iii) $P_0 = \frac{20(1-0.50)}{0.11-(0.50\times0.10)}$ $\boxed{\therefore r = 10\%}$

$= \frac{10}{0.06}$

= ` 166.67

**21. Market price per share Rs. 60 at the optimum pay out Ratio under walter's model. Eps Rs = 5, $K_e$ = 10% Calculate Rate of return on investment.**

*Sol :*

$$\boxed{P_0 = \frac{\text{Div} + \left(\frac{r}{K}\right)(\text{Eps}-\text{Div})}{K_e}}$$

$$60 = \frac{0+\left(\frac{r}{10}\right)(5-0)}{0.10}$$

$$60\times0.10 = 0+\left(\frac{r}{0.10}\right)^5$$

$$6 = \left(\frac{r}{0.10}\right)^5$$

6 × 0.10 = 5r

0.6 = 5r

$\therefore$ r = $\frac{0.6}{5}$ = 0.12

Rate of Return = 12%.

**22. Market price per share at 0% redemption ratio is Rs. 100, Eps = Rs. 10, r = 8% calculate Cost of Capital assume the firm is declining firm.**

*Sol :*

mp = 100 Eps = Rs. 10, r = 8%, $K_e$ = ?

Div = $10\times\frac{10}{100}$ = 10%

$$\boxed{P_0 = \frac{Div + \left(\frac{r}{K_e}\right)(Eps-Div)}{K_e}}$$

$$100 = \frac{10+\left(\frac{0.08}{K_e}\right)(10-10)}{K_e}$$

$$100\ K_e = 10+\left(\frac{0.08}{K_e}\right)(0)$$

$$100\ K_e = 10 + 0$$

$$K_e = \frac{10}{100} = 0.10 \times 100$$

$$= 10\%.$$

**23. Agile Ltd., belongs to risk class of which appropriate capitalization rate is 10%. It currently has 100000 shares selling at Rs. 100 each. The firm is contemplating declaration of a dividend of Rs. 6 per share at the end of the current fiscal year which has just began. Answer the following questions based on Modigliani and Miller model and assumption of no taxes,**

**(i) What will be the price of the shares at the end of the year if a dividend is not declared?**

**(ii) What will be the price if dividend is declared?**

**(iii) Assuming that the firm pays dividend, has net income of Rs. 10 lakhs and makes new investments of Rs. 20 lakhs during the period, how many new shares must be issued ?**

*Sol :*

MM valuation model is as follows,

$$\boxed{P_0 = \frac{D_1 + P_1}{1+P}}$$

Where,

$P_0$ = Current market price per share = Rs. 100.

$P$ = Capitalization rate = 10%.

$D_1$ = Dividend to be declared at the and of the year.

$P_1$ = Market price per share at the end of the year.

(i) Price per share at the end of the year if dividend is not declared,

$$P_0 = \frac{D_1 + P_1}{1+P}$$

$$P_0 = 100$$

$P = 10\%$

$D_1 = 0$

$$\therefore 100 = \frac{(0 + P_1)}{(1 + 0.10)}$$

$\Rightarrow P_1 = $ Rs. 100

(ii) Price per share at the end of the year if dividend of Rs. 6 is declared.

$$P_0 = \frac{D_1 + P_1}{1 + p}$$

Where,

$P_0 = 100$, $P = 10\%$, $D_1 = 6$

$$\therefore 100 = \frac{(6 + P_1)}{(1 + 0.10)}$$

$\Rightarrow P_1 = $ Rs. 104.

(iii) Retained earnings = Net income – Dividend paid

= Rs. 10 lakhs – Rs. 6 lakhs = Rs. 4 lakhs

New investment is Rs. 20 lakhs

Funds required will be (Rs. 20 – Rs. 4) = Rs. 16 lakhs

Price per share as above Rs. 104.

Number of new shares to be issued = $\frac{\text{Rs. } 16,00,000}{\text{Rs. } 104} = 15385$ shares



**24. X Ltd., had 50,000 equity shares of Rs. 10 each outstanding on January 1. The share are currently being quoted at par in the market. The company now intends to pay a dividend of Rs. 2 per whose appropriate capitalization rate is 15% Using M.M. model and assuming capitalization rate is 15%. Using M.M. Model and assuming no taxes, ascertain the price of the company's share as it is likely to prevail at the end of the year,**

**i) When dividend is declared and**

**ii) When no dividend is declared.**

**Also find out the number of new equity shares that the company must issue to meet its investment needs of Rs. 2 lakhs, assuming a net income of Rs. 1,10,000 and also assuming that the dividend is paid.**

*Sol :*

i) Price of the share when dividends are paid,

$$P_0 = \frac{D_1 + P_1}{1 + k_e}$$

$$\Rightarrow \text{Rs. } 10 = \text{Rs. } \frac{2+P_1}{1.15}$$

$$\Rightarrow \text{Rs. } 11.5 = \text{Rs. } 2 + P_1$$

$$\therefore \quad P_1 = \text{Rs. } 9.5$$

ii) Price of the share when dividends are not paid,

$$\Rightarrow \text{Rs. } 10 = \frac{P_1}{1.15}$$

$$\therefore \quad P_1 = \text{Rs. } 11.5$$

Number of new equity shares to be issued,

$$\Delta n = \frac{I-(E-nD_1)}{P_1}$$

$$= \frac{2,00,000-(1,10,000-1,00,000)}{9.5}$$

= 20,000 shares.

### 3.7.3 Factors Determining Dividend Policy

**Q30. Explain the Factors Determining Dividend Policy.**

*Ans :* **(May-19, Dec.-18, Aug.-11)**

**1. Legal Restrictions**

In deciding on the dividend, the directors take the legal requirements too into consideration. In order to protect the interests of creditors an outsiders, the companies Act 1956 prescribes certain guidelines in respect of the distribution and payment of dividend. Moreover, a company is required to provide for depreciation on its fixed and tangible assets before declaring dividend on shares. It proposes that Dividend should not be distributed out of capita, in any case. Likewise, contractual obligation should also be fulfilled, for example, payment of dividend on preference shares in priority over ordinary dividend.

**2. Size of the Earnings**

Practically and truly speaking, the upper ceiling on dividend is dictated by the earnings of the business. If the amount and the nature of earnings are relatively stable a firm is better able to predict what its future earnings will be and is, therefore, more likely to pay-out a higher percentage of profits. A rational dividend policy should take into account both the amount and nature of earnings from year to year.

**3. Investment Opportunities and Share holder's Preferences**

Management should adopt a dividend policy which strikes a balance between the shareholder's preference for dividends and financing investment opportunities with retained profits. Having a large number of profitable projects in hand, a company should give preference to the retention of earnings over the payment of dividends. The preference of shareholders for dividends and capital gains needs to be paid full heed. To a great extent the preference for dividends or capital gain is determined by the economic status of the shareholders and the tax bracket to which he belongs. The capital gains tax rate is generally lower than the dividend tax rate. As against current dividends a financially better-off shareholder in a high income tax bracket may be interested in capital gains. A prudent dividend policy should take full care of these aspects.

**4. Liquidity Position**

Because the payment of dividends involves outflow of cash from the business, the dividend policy must take into account the liquidity position of the firm. Even if a firm has had a good record of earnings, it may not be able to pay cash dividends due to its liquidity position. Even a very profitable business has a pressing need for funds. Hence a firm may elect not to pay cash dividends.

**5. Management's Attitude towards Control**

As a matter of policy, some companies expand only to the extent of their internal earnings. This is justified on the ground that raising funds by selling additional shares would dilute the control of the company. Selling debentures will increase the risks of fluctuating earnings to the detriment of the present members of the company. The management's attitude towards control would reduce the dividend pay-out and increase reliance on internal financing.

6. **State of Capital Market and Access to it**

The corporate management may be tempted to follow a liberal policy if the fund position in the capital market of the country is comfortable and the firm can take recourse to it due to its good earnings position. If the capital market funds position is comfortable but the firm has no access to it due to high cost of capital it would compel the company to rely on retained earnings and follow a conservative dividend policy.

7. **Contractual Restrictions**

Sometimes a firm's ability to pay cash dividends is restricted by certain specific conditions in loan agreements. When the finances are raised from external sources, creditors may impose various restrictions to immunize themselves for possible insolvency of the firm. While formulating the dividends policy, the financial manager must keep in mind various contractual requirements. The creditors may withdraw their money from the firm if these requirements are violated.

8. **Profit Rate and Stability of Earnings**

A firm with a large rate of return on its investment will have larger profits. It can pay more dividends to its shareholders as compared to a firm with lesser return. Again, if the earnings are relatively stable and do not fluctuate from time to time, a firm can predict its future earnings and pay a higher rate of dividend than a firm with fluctuating earnings. An unstable firm cannot determine what will be its actual future earnings. Therefore, to meet adverse future conditions, it is likely to plough back more profits.

9. **Inflation**

It increases the replacement cost of assets which are being depreciated every year at the book value. Funds generated from providing depreciation may be insufficient to meet the rising cost of assets which might become obsolete and have to be replaced in future. Therefore the management should reduce the rate of dividend during a period of inflation to maintain the earning power of the firm.

To conclude, every firm should establish a general policy about the payment of dividends. An appropriate dividend policy can be shaped by a multiplicity of considerations. The financial manager should bring about a balance among various factors.

### 3.7.4 Dividends and valuation of the firm - the basic models

**Q31. Explain about dividend capitalization model.**

*Ans :*

**Dividend Capitalization Model**

For an equity share, the payments are in the form of dividends, declared by the company.

As the equity is a perpetual security i.e., with no maturity date, the dividend payments are made periodically throughout its infinite life. So, the intrinsic value of a share is represented by the equation,

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + ....... + \frac{D_n}{(1+k_e)^t}$$

$$= \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t}$$

Where,

$D_t$ = Dividend payment at time t

$k_e$ = Equity capitalization rate

$P_0$ = Present value of a share.

Therefore, the value of an asset is the present value of all cash flow an investor expects from that asset and this approach is known as dividend capitalization model. It is also known as capitalization of income method. The intrinsic value of an equity share depends on the dividends declared by the company. These models can be broadly classified as follows,

(i) Single period valuation model and

(ii) Multiple-period growth valuation model.

In these models, the infinite stream of future dividends are valued by considering value while computing the present price dividends ratio. If the net earnings are assumed to be the same as dividends and no retained earnings, then the price-dividends ratio becomes equal to the price earnings ratio.

**(i) Single Period Valuation Model**

This model assumes the following,

(a) The dividends are paid annually

(b) The first dividend is received after one year and

(c) The resale occurs at the end of the year.

Then the price of the share is,

$$P_0 = \frac{D_1}{(1+k)} + \frac{P_1}{(1+k)} = \frac{D_1 + P_1}{(1+k)}$$

Where,

$P_0$ = The current price

$P_1$ = Price after an year

$D_1$ = The dividend after a year

k = The required rate of return.

**(ii) Multiple-period Growth Valuation Models**

Multiple growth model of dividends valuation is one of the dividend growth models which can be mostly used to value the stocks. In this model, dividends tend to grow at different growth rates for different time periods. The investor needs to estimate or forecast the dividend rate at a time in future (T) beyond this time period there will be a consistent growth in the dividends. The investor should also forecast the constant rate of dividend growth after a particular period of time in future.

The following equations represent the time durations and the growth rate of dividends in the multistage growth model,

$D_{T+1} = D_T (l + g)$

$D_{t+2} = D_{T+l} (1 + g)$ or $D_T (1 + g)^2$

$D_{T+3} = D_{T+2} (1 + g)$ or $D_T (1 + g)^3$

In multiple stage growth model, the value of the stock can be determined by,

$$\boxed{P_0 = \left[\frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + .... + \frac{D_T}{(1+k)^T} + \frac{D_{T+1}}{(k-g)(1+k)^T}\right]}$$

Where,

$D_1$ = Dividend rate for the first period

$D_2$ = Dividend rate for the second period

$D_T$ = Dividend rate after 'T' time period

k = Cost of capital

g = Growth rate.

In this model, there are three stages which includes,

1. Initial stage which is characterized by a stable high growth
2. Transition stage wherein growth rate declines
3. Final stage is characterized by a constant or sustainable growth rate of dividends.

**Q32. Explain briefly about constant growth model of dividend and two stage model of common stock valuation.**

*Ans :*

**(i) Constant Growth Model of Dividend**

With the progress of time, the dividend payments may increase i.e., $D_1 < D_2 < D_3$ and so on. So the price of the share under this phenomenon is,

$$P_0 = \frac{D_1}{k-g}$$

Where, $P_0$ = Price per share

$D_1$ = Dividend payment at time t

k = Expected rate of return

g - Growth rate.

This equation assumes a constant growth rate in dividend and hence it is called as the constant growth dividend capitalization model.

**(ii) Two Stage Model of Common Stock Valuation**

An investor would hold the security for more than one period. In that case the price of the share is given by the formula,

$$P_0 = \left(\sum_{t=1}^{n} \frac{D_t\left(1+g_1\right)^t}{\left(1+k\right)^t}\right) + \frac{D_n\left(1+g_2\right)}{\left(k-g_2\right)\left(1+k\right)^n}$$

Where,

$D_n$ = Dividend per share in time period n

$g_1$ = Initial growth rate

$g_2$ = Longer run growth rate

n = Number of years that $g_1$ last

## 3.8 Forms of Dividend

**Q33. Explain the major forms of dividend.**

*Ans :* **(Dec.-19, March-15)**

Dividend can be categorized into different forms. Usually, the dividends paid in business are termed as profit dividends, whereas liquidation dividends are those dividends which are drawn out of capital. On the basis of terms in which they are paid, dividends can be explained as follows,

**a) Cash Dividend**

A common method followed by many companies in paying the dividend to their shareholders is cash dividend. Company must have sufficient liquid assets/resources to overcome the negative impact of payment of cash dividend. Payment of dividend in cash leads to reduction in net profit of the company because of outflow of funds.

**b) Scrip (or) Bond Dividend**

A scrip dividend guarantees the shareholder to pay the dividend in future on specific date. When there is insufficient funds in the company then company will issue bonds for due amount to shareholders to pay in future. The main purpose of scrip dividend is to delay instant payment of cash. It is recognized as collateral security and yields interest on it.

**c) Property Dividend**

This form of dividend is not famous in India. It is very rare that company pay dividend in the form of assets or its products. It happens only when there is insufficient funds.

**d) Stock Dividend**

In times of insufficient liquid resources, company issue bonus shares which is known as stock dividend. Stock dividend leads to capitalization of profits and also distribute profits to prevailing shareholders without having any impact on the cash of the firm.

## 3.9 Declaration and Payment of Dividends

**Q34. Explain the procedure declaration and payment of dividends.**

**(OR)**

**What is information content of dividend payments explain.**

*Ans :* **(Nov.-20, Dec.-19, Feb.-17)**

The board of directors of a public limited company have the responsibility for determining the amount of the concern to be distributed as "dividend". The board of directors decide both the amount and the date at which dividend has to be paid. The 'declaration date' is a date on which the board of directors officially authorizes the payment of dividend. After such authorization, it becomes a liability for the firm to pay the dividends as per the preset schedule.

Every concern is required to pay the dividend amount to all its shareholders on a particular date as decided by the board of directors it is usually as referred to **"record date".** As, it usually takes three business days for obtaining the registration of shares, only those shareholders who purchases the shares prior to the record date are liable for availing the benefits of dividends, whereas the shareholders who makes payment after the record date cannot attain the dividends which is two days prior to the record date is called as **"ex-dividend date"** and the investors may not be able to receive the dividends if they have purchased the stock after the ex-dividend date.

Lastly, on the distribution date (which is a month away from the record date), the firm sends the dividend cheques through mails to the shareholders who are registered during the incorporation of a company The following figure shows these dates to $4.00 dividend.

**Important Dates for XYZ's Special Dividend**

| Declaration Date (July 25, 2006) | Ex-dividend Date (Nov 20, 2006) | Record Date (Nov-22, 2006) | Payable Date (Dec-04, 2006) |
|---|---|---|---|
| Declaration of special dividend of $4 per share prior to this date | No receipt of dividends after this date $4 per share. | Shareholders receive dividend if they purchases | Shareholders receive actual payments for dividends at a rate of |

The XYZ has declared the dividend on July 25, 2006 which was payable on December 04 to all its shareholders who have a record date of November 22. As the record date was November 22, the date of ex-dividend was just two days prior to the record date i.e., on November 20, 2006.

Most of the companies pay the dividends to their shareholders quarterly or at regular intervals of time. Occassionally, when the firm is able to generate more revenues, special dividends will be declared by the firm. In this case, XYZ declared a special dividend of $4 per share in 2006 due to its high sales turnover.

There are various dividend policies which can be dealt in detail as follows:

In a perfect capital market, when a dividend is paid, the market price of share decreases in the equal proportion that of the amount of the dividend when the equity shares are begin to trade beyond the ex-dividend date.

### Policy 1: Payment of Dividend with Excess Cash

In this type of dividend policy, firms will be distributing the entire amount of surplus cash generated as "Dividend among its existing shareholders. According to this policy, in a perfectly capital market, the trading of stock be their ex-dividend date causes an equal decline in the market price of shares as that of the amount of dividend. The mechanism of such dividend policy can be clearly understood with the help of an example.

### Example

Consider that Amazon has about 20 million outstanding shares and the company is paying a dividend of about S4 on the existing shareholdings of shareholders. When a company is expected to generate a future cash flows of a bout $65 million per year, its future dividend per share increases to about $6.5 each year thereafter. The board of directors of Amazon declared a dividend and sets December 9 as its ex-dividend date which is two days prior to the record date (December 11).

**Computation of Share Price of Amazon Before and After the Ex-dividend Date**

Consider that Amazon does not have debt, then its equity cost of capital becomes equal to that of the unlevered cost of capital which was found to be 10%. The stock is said to trade as "cum-dividend" (i.e., along with the dividend as the shareholders are entitled to receive the dividends when they have purchased the stock prior to the ex-dividend date.

$$P_{cum} = \text{Current dividend} + \text{Future dividends}$$

$$= 4 + \frac{6.80}{0.10} = 4 + 68 = 72$$

After the ex-dividend date, the new investors are not entitled to receive the current dividends. However, they are liable to receive only the future dividends.

$$P_{EX} = \text{Future dividends} = \frac{6.80}{0.10} = \$68$$

Share price tends to decline at the ex-dividend date, December 9. In this policy, as the decline in share price is directly related to the amount of current dividend, the Amazon share price falls by $4 per share. Such affect can be studied by understanding the balance sheet of Amazon.

| Particulars | December 8 (Cum-Dividend) | December 9 (Ex-dividend) |
|---|---|---|
| Cash | 40 | 0 |
| Other assets | 300 | 300 |
| Total market value | 720 | 680 |
| Shares (millions) | 20 | 20 ‘ |
| Share price | $72 | $68 |

The balance sheet represents the decline in the share price on the payment of dividend, their decline is due to the cash fall observed in the market value of the firm's assets. Even though there is a decline but the shareholders of Amazon does not really incur an overall loss as they were holding $4 in cash from that of the total value of dividend which was found to be $72.

It also represents a fact that no arbitrage opportunity can be realized if the stock price falls below the amount of the dividend. When the share price falls below the dividend rate, an investor can earn profit by purchasing the securities before its ex-dividend date and sells it when its value tends to increase thereby covering the cost of capital i.e., the capital loss on the stock. Similarly, if it falls far beyond the dividend rate, an investor would be profitable by selling the shares before its ex-dividend and purchasing it after the ex-dividend.

**Policy 2: Share Repurchase (No Dividend)**

If the Amazon fails to pay a dividend in the following year, but opts for another option of using $40 million by reinvesting the shares in the capital formation as repurchase shares, can be profitably traded in the open market. Then, the repurchase of shares have its impact on the share prices as follows,

Given initial price = $72 (As calculated in Policy 1)

Amazon will repurchase at,

$40 million -H $72 per share = 0.555 million shares

The outstanding shares can be computed by deducting the repurchase value from the total value of shares, i.e., 20 - 0.555 = 19.445 million shares.

Therefore, 19.445 million shares can be kept as outstanding shares.

The above transactions can be analyzed by considering Amazon's market value balance sheet again.

| Particulars | December 08 (Before Repurchase) | December 09 (After Repurchase) |
|---|---|---|
| Cash | 40 | 0 |
| Other assets | 300 | 300 |
| Total market value of assets | 720 | 680 |
| Shares (millions) | 20 | 19.445 |
| Share price | $72 | $72 |

The Amazon's assets as well as number of shares which are outstanding also decline, if the company is able to payout cash. Since, the changes moves in opposite directions they can off-set each other by maintaining consistency in the market price of the outstanding shares.

**Amazon's Future Dividends**

The price of share remains constant after repurchase of shares can be studied by considering the mechanism of Amazon's future dividends. Amazon's future dividends could be $68 million in free cash flow and this amount can be utilized for paying dividend as follows,

$68 million 19.445 million shares

= $3.50 per share each year

Therefore, the current share price of share repurchase is found to be,

$$P_{rep} = \frac{3.50}{0.10} = \$35$$

Amazon is considering an option of repurchasing share rather than paying dividend because the company can maximize its profits by increasing the dividends per share in the future which inturns maximizes the wealth of shareholders.

But in perfect capital market, the share repurchase in an open market has not impact on stock price if the dividends are immediately paid.

**Policy 3: It Deals with High Dividend (Equity Issue)**

In this case, if the board desires to pay more dividend than $4 to the shareholders. The effects of this decision can be analyzed by Amazon as follows,

Suppose an Amazon is paying $68 million dividends in the consecutive years. But, the amount possessed by the Amazon company is cash today is $40 million. For this purpose, Amazon needs an extra $48 million so as to pay higher dividend as compared to the dividends paid in the previous years.

The company can exercise three options in raising dividend. They are,

i) It could increase its cash by scaling back its investments.

ii) In case of positive NPV, to dividends have to be raised as this decreases the value of the firm.

iii) To increase the value of cash the company can either borrow money or it can sell new shares.

Amazon company can raise $48 million by selling in the following way,

$$\$48 \text{ million} \div \$\ 72 \text{ per shares}$$

$$= 0.67 \text{ million shares}$$

Now, the Amazon's total number of outstanding shares increases to 20.67 million.

∴ The amount pertaining to dividend per share per year.

$$= \frac{\$68}{20.67 \text{ million share}} = \$\ 3.29 \text{ per share}$$

According to a new policy, Amazon's cum-dividend share price is,

$$P_{cum} = 3.29 + \frac{3.29}{0.10}$$

$$= 3.29 + 32.9$$

$$= \$\ 36.19$$

This means no change in the initial share price and no profits to the shareholders.

### 3.9.1 Bonus Shares

**Q35. Define Bonus Shares. Explain the objectives of bonus shares.**

*Ans :* **(Sep.-16)**

Bonus shares are those shares which are given by the company to its shareholders as a bonus or gift. Bonus can be in any form either cash or shares. When company is not in a position to give bonus in cash, it issue bonus shares.

The meaning of bonus shares in dictionary is "an extra dividend paid to shareholders in a joint stock company from surplus profit". Bonus shares are referred as shares allotted by capitalization of the reserves or surplus of a corporate enterprise. Profits of the company are converted into share capital with issue of bonus shares. Capital structure of the company is not influenced by issuing of shares as it is capitalizing shareholders equity.

Bonus shares are useful to both shareholders as well as company in many ways.

**Objectives/Reasons for Bonus Issue**

As we have seen in the above illustration, issue of bonus shares does not affect capital structure, at the same time earnings per share (EPS), market price per share (MPS), decreases due to the increase in number of equity shares. It indicates that it does not have any actual effect on equity shareholder's wealth. Then why do companies go for bonus issue? At the same time shareholders also look for bonus issue. Shareholders prefer to buy stock of a company that has been declaring bonus shares, or a company that is going to declare bonus shares. The following are the prime reasons for issue of bonus shares:

1. To bring clown the market price per share within a more popular range - For example, Infosys Technologies has been issuing bonus shares, with an idea to bring down it's a share price within a more popular range. Why it has a to do this? If the share is selling at high, there would not be active trading of stocks, because the common man cannot offord to

buy. If the share is not trading actively in the market it looses its place in the Index Computation [if it is there in Sensex pack].

2. To remote active trading of shares in the secondary market.

3. To reduce the impression that the company is making huge profits, because bonus issue increases number of shares, thereby dividend comes down.

4. To achieve respectable size in the eyes of investors [individuals as well as institutions] - Bonus issues increase capital base.

5. To send signals that company's future prospects have brightened and also create an impression that future dividends will increase.

6. To improve prospects of raising additional funds as said earlier, investors prefer to invest in a company which is declaring dividends. Bonus issue helps to raise additional funds easily.

**Q36. Explain the Advantages of Issue of Bonus Shares.**

*Ans :*

We have understood in the above discussion that issue of bonus shares do not affect the wealth of shareholders. But in practice, it carries some advantages for both the company and to the ordinary shareholders.

**I. Advantages to the Company**

The following are some of the advantages enjoyed by the issuing company.

- **Conversion of Cash /Maintenance of Liquidity Position**

  Issue of bonus share/stock will not reduce the cash position of the firm. Through this form of dividends firm will be able to retain earnings and at the same time it can satisfy shareholders. So it can maintain liquidity position.

- **Only way to pay Dividends under Financial Difficulty and Contractual Restrictions**

  When there are no profits, companies will issue bonus shares just to justify to the shareholders. Payment of dividend in the form of bonus shares at difficult times does not convey the company's position to the shareholders and the investing community. This form of dividend payment is also necessary when there are restrictions from the loan granters to pay dividends in the form of cash. Hence, under the financial difficulty or contractual constraints from creditors to cash dividend, issue of stock dividend is needed to maintain the confidence of the shareholders in the firm.

- **Attractive Share Price**

  Generally, higher share price is attractive to investors, but it is not so for small investors. Issue of bonus shares reduces market price of shares and attracts small investors. Therefore, many companies pay dividends in the form of bonus shares to bring the share price into popular trading range.

- **Enhances Prestige**

  Payment of dividend by way of issue of stock of the company increases its borrowing capacity. The company, which pays stock dividend will increase credit standing in the market and it leads to increase of the borrowing capacity of the company in the eyes of the lending institutions.

- **Widening the Share for Market**

  A company that is interested in widening ownership shares, may pay dividend by way of issue of stock. Because of increased prestige of the firm, there will be a good demand for the share of the company.

- **Availability of Funds for Expansion Programme**

  Through the retention of profits expansion programmes can be financed. But the retention takes place through the issue of stock dividend. It becomes a permanent part of the capital structure of a company. Hence, it helps for expansion programmes.

**II. Advantages to Ordinary Shareholders**

The following are some of the advantages enjoyed by the owners.

- **Tax Savings**

  Receipt of cash dividend involves payment of tax according to ordinary tax rates. By receipt of dividends in the form of stock dividend does not involve payment of tax.

- **Indication of Future Benefits**

  As we have seen in the above features issue of bonus shares is an indication of profiteering. With payment of stock dividend the existing owner receives more shares. If the company maintains one present rate of dividend, shareholders receive more income since their number of shares are increased.

- **Psychological Value**

  Receipt of bonus shares may have a favourable psychological impact on the investors.



## PROBLEM ON BONUS SHARES

**25. The following are capital structure of XYZ Ltd.,**

| | |
|---|---|
| **Equity Share Capital** | **(Rs.10 Share)** |
| **Share Premium** | **Rs. 3,00,000** |
| **Reserves and Surplus** | **Rs. 1,50,000** |
| **Total** | **Rs. 6,50,000** |

**The company issues bonus share to its existing equity shareholders in the ratio of 1 for 10 at the market price is Rs. 15 per share show the,**

**i) The new capitalization of company.**

**ii) Earning per share before and after bonus issued presuming the net earnings as rs. 22,000**

*Sol :*

The bonus issue amount to Rs. 3,00,000 (20,000 × 15)

**i) Calculation of New Capitalization of a Company**

| | |
|---|---|
| Equity Share Capital | 2,20,000 |
| (22,000 Share of Rs. 10 each) | |
| Share Premium (3 Lakhs – 10,0-00 + 10,000) | 3,00,000 |
| Reserves and Surplus (1,50,000 – 20,000) | 1,30,000 |
| **Total Networth** | **6,50,000** |

**ii) Earning per share Before issue of Bonus**

Net earnings = Rs. 22,000

No. of equity share = Rs. 20,000

$$EPS = \frac{\text{Net earnings}}{\text{Number of equity shares}}$$

$$= \frac{22,000}{20,000} = 1.10$$

**Earning Per Share of the issue of Bonus**

Net earnings = Rs. 22,000

Number of equity share = Rs. 22,000

$$EPS = \frac{\text{Net earnings}}{\text{Number of equity shares}}$$

$$= \frac{22,000}{22,000} = 1$$

As there is an decrease in EPS the earning of shareholders remain constant.

### 3.9.2 Rights issue and Share-splits

**Q37. What is Rights issue ? Explain the guide lines issued by SEBI for right issues.**

*Ans :*

"An option to buy a security at a specified price during a specific period. The right shares are the shares issued to shareholders."

According to Weston and Brigham these are mainly occurred in joint stock company. The share holders are given the pre-emptive right by the Act applicable. A pre-emptive right is also known as "Rights". This right gives holders of common stock as a first option to purchase additional issue of common stock.

**SEBI Guidelines on Right Issue**

The Securities and Exchange Board of India has issued the following guidelines to companies on right issues,

1) Where public and rights issues are made as composite they can be made at different media.
2) Gap between the closure dates of rights issue and public issues should not exceed 30 days.
3) For rights issue of listed companies exceeding a sum of Rs. 50 lacks, issue should be managed by an authorized merchant banker.
4) Reservation if rights issue is allowed and it is subjected to a lock in period of 3 years.
5) Rights issue must have been underwritten at least to the extent of net rights offer.
6) Rights issue is not to be kept open for more than 60 days.
7) Proposed rights issue should not result in the dilution of the value or rights of FC/PC debenture-holders.
8) The letter of offer must conform to the disclosure prescribed in Form 2 u/s 56(3) of the Companies Act, 1956.
9) Under any circumstances, no part of over-subscription should be retained, i.e., the issue should not exceed the quantum specified in the prospectus.
10) Rights issue should be fully paid-up within 12 months where the total issue is less than Rs. 500 crores.
11) Letter of offer pertaining to rights issue should get voted by SEBI before approach has been made to stock exchange for fixing the date of the proposed issue.
12) Within 45 days of closure of rights issue, a compliance report duly signed by statutory auditor/practising chartered accountant/ company secretary in practice must be forwarded.

**Valuation**

The company can issue a new shares to the existing shareholder at the lower price than their market price. This is due to,

1) Company want to give some advantage to shareholders because of the continuing with the company.
2) Company want to make right issue as success.

The company sell the share to the existing shareholders at the lesser cost because to make a profit by selling his right to apply for new share.

The price of the share may be "Cum-right price" or "Ex-right price".

The "Cum-right price" give the right to apply a new share, beside the ownership which is already held."

The "Ex-right price" gives the buyer only the ownership of the existing share held by the seller.

The value of right can be calculated by applying the formula,

$$R = \frac{M - S}{N + 1}$$

where,

R = Value of the share,

M = Cum-right market price of the share,

S = Subscription,

N = Number of shares.

The Ex-right shares can be calculated as,

$$P = \frac{MN - S}{N + 1}$$

where,

P = market value of ex-right share.

**Q38. Explain the advantages of right issue.**

*Ans :*

The following are the advantages of rights issue made to the existing shareholders,

1. It avoids the expense which has to be increased by a firm during the issue of shares to the public.
2. It is associated with certain factors as they have to be sold to the existing shareholders.
3. It improves the image of the firm which inturn stimulates alternative responses from the shareholders and the investment market.
4. Rights issue plays a vital role in maintaining the equitable distribution of shares so as to ensure the attainment of equilibrium and control of the company is preserved in the hands of the existing shareholders.
5. Through renouncing the nominee, directors do not take undue advantage of the opportunity of issuing the new shares to their relatives and friends, even they can built the strong relationship with the company.

**Q39. Differences between right issue and bonus shares.**

*Ans :* **(Sep.-14)**

| S.No | Right Issue | S.No. | Bonus Share |
|---|---|---|---|
| 1. | Right issue (shares) are issued to Shareholders against payment of specified amount. | 1. | Bonus shares are issued for free of cost |
| 2. | Right issue is governed by the provisions of companies Act and SEBI guidelines. | 2. | Bonus issues is governed by the company's Articles/ Table A and the detailed SEBI guidelines. |
| 3. | In right issue, members have the right to transfer shares in favour of his nominee | 3. | In bonus shares, there is no such facility |
| 4. | If company does not receive minimum subscription for right issue then it should return entire money received | 4. | It is applicable in case of bonus shares as it does not not involve any money. |
| 5. | Company must maintain a separate bank account to keep the received money until stock exchange approves the allotment. | 5. | Does not require any bank account. |
| 6. | Right shares can be partly paid up. | 6. | Bonus shares are always fully paid up |

**Q40. What is share split ? Explain the various reasons for share split.**

*Ans :*

Share split can be done only by publicly - traded companies which have a number of shares outstanding on the stock market. Stock split is the action of corporate to reduce the par value of stock and increase the number of shares proportionately.

Share split is a decision by the company's Board of Directors (BoDs) to increase the number of shares that are outstanding by issuing more shares to the current shareholders.

### Objectives Behind Stock Split

The primary motive behind stock split is to make shares more affordable to small investors without changing the value of the company.

But sometimes stock split can also result in a stock price increase following the decrease immediately after the split. Since many small investors come forward to buy stock and boosting demand for shares, which lead to share price increase. Another reason for stock **price increase is** that a stock split provides a signal to the market that the company's share price has been increasing and people assume this growth will continue in the future, and again lift demand and increases share price. With the above we can understand that companies can achieve the objective of bringing share price to an affordable level for a short period only (immediately after stock split.

### Reasons for Share Split

The following are the reasons for splitting of a firm's ordinary (equity) shares.

**1. To Make Share Trading to Attractive**

The prime reason of stock split is to reduce the share price in the market, attract small investors. In other words, the firm provides broader and stable market for its stock. With stock split, the shares are placed in a more popular trading range that helps in providing marketability and liquidity to the firm's shares.

**2. Indication of Higher Profits in the Future**

Share split sends wrong signals to the investors that the firm is expecting higher profits in the near future. Blue chip or high-growth firm's share price (market price) goes up very fast, that puts the firm's shares out of the popular trading range. To put shares in a, popular range firms split shares periodically.

**3. To give Higher Dividends to Share holders**

Share split is the only way through which a company can increase or reduce the cash dividend per share proportionately. However, the total dividends of a shareholder increase after a share split.

**Reverse Split**

It is a quite opposite to the stock split, where a company reduces the number of outstanding shares to increase the market price per share. For example, a company has 8 lakhs outstanding shares (equity) of `.10 each. If company declares a reverse split two for four. Now the company will have 4 lakhs shares of `. 20 per share.

## 3.10 Major forms of dividends – Cash and Bonus shares

**Q41. What are the major forms of dividends? Discuss about he conditions in which a company should avoid paying cash dividend.**

*Ans:*

**Major Forms of Dividends**

There are two major forms of dividend. They are,

1. Cash dividend
2. Bonus shares

**1. Cash Dividend**

A common method followed by many companies in paying the dividend to their shareholders is cash dividend. Company must have sufficient liquid assets/resources to overcome the negative impact of payment of cash dividend. Payment of dividend in cash leads to reduction in net profit of the company because of outflow of funds.

**2. Bonus Shares**

Bonus shares are those shares which are given by the company to its shareholders as a bonus or gift. Bonus can be in any form either cash or shares. When company is not in a position to give bonus in cash, it issue bonus shares.

The meaning of bonus shares in dictionary is "an extra dividend paid to shareholders in a joint stock company from surplus profit". Bonus shares are referred as shares allotted by capitalization of the reserves or surplus of a corporate enterprise. Profits of the company are converted into share capital with issue of bonus shares. Capital structure of the company is not influenced by issuing of shares as it is capitalizing shareholders equity.

Conditions in which a Company Should Avoid Paying Cash Dividend

Usually, companies pay dividends in the form of cash, certain conditions restricts the firm from paying cash dividends. Some of the conditions are as follows,

**1. Re-investment Opportunity**

The management and board members assume that money can be reinvested into the company for research and development, capital investment, expansion etc., which is much more profitable than paying dividends to its shareholders.

Hence, a company avoids dividend payment when it has good investment opportunities.

**2. Double Taxation**

The payment of dividend involves double taxation. First, company pays taxes to government for income earned and then individual shareholders must pay tax for dividend received. In order to avoid double taxation, company use dividend amount as retained earnings or for stock buyback.

**3. Liquidity**

Companies with poor liquidity condition avoid payment of cash dividend as it involves outflow of cash.

**4. Legal Restrictions**

There are certain legal restrictions imposed by Indian Companies Act on the payment of dividends. According to which dividend needs to be paid only from the current profits or post profits of the firm that had been obtained after providing depreciation.

Hence, companies can pay dividends only when the above conditions are satisfied.

**5. Inflation**

Companies avoid payment of dividend during inflation to maintain their position and some companies pay more dividends during high inflation to retain their shareholders.

**6. Restrictions in Loan Agreements**

Usually, lenders impose certain restrictions on payment of dividend of the firms which possess low liquidity' or low profitability. Due to these restrictions of the lenders, companies avoid paying dividends.

## 3.11 The Theoretical Backdrop - Dividends and Valuations

**Q42. Explain the theoretical backdrop of dividends and valuations.**

*Ans :*

The residual theory is used in overcoming the limitations of theoretical backdrop of dividends. This theory is considered as a school of thought suggest that if the firm is paying dividend to its shareholders then it should be treated as "Residual" in the books of accounts and balance as it constitutes the surplus amount left with the firm after undertaking the investment projects. This theory is used by the firm while taking dividend decisions which is based on three steps. They are as follows,

1. Estimation of optimal level of capital expenditure is at the point of intersection of IOS (Investment Opportunity Schedule) and WMCC (Weighted Marginal Cost of Capital).
2. By using the proportion of optimal capital structure, the need of equity financing to meet the capital expenditure of the firm is analyzed (i.e., obtained in step 1).
3. If the cost of common stock ($K_S$) is more than the cost of retained earnings ($K_r$) than the retained earnings should be used to realize the equity requirements. On the other hand, if the retained earnings are not sufficient to meet the equity requirements than it could be fulfilled by selling the common stock. If retained earnings are in excess amount then the surplus amount (or residual amount) should be distributed among the stock holders as "Dividends".

According to this theory cash dividends will not be paid to the shareholders if the equity of the firm exceeds the amount of retained earnings. It is essential for the company to maintain its financing stability, such that the dividends policy of firm remains independent of the returns of investors.

## 3.12 Major Theories Centered on the Works of Gordon, Walter and Lintner

**Q43. Explain briefly about Lintner theory of dividend.**

*Ans :*

In 1956, John Lintner researched on pattern of corporate dividend behaviour and explained the following important points.

1. Usually firms plan long-run target payout ratios,
2. Dividends are constant because managers believe that any changes in dividend have a negative impact on earnings,
3. Managers mainly focus on fluctuations in dividends, than on earnings.
4. Changes in dividends are slow than earnings because of their sticky nature.

**According to Lintner.** dividend is a function of earnings of that particular year, prevailing dividend rate, target payout ratio and speed of adjustment.

Corporate dividend behaviour is explained by the Lintner in the following form,

$D_t = C_r EPS_t + (1 - c)D_{t-1}$ ,

Where,

$D_t$ = Dividend per share for year $t$

$C_r$ = Adjustment rate

r - Target payout rate

$EPS_t$ = Earnings per share for year $t$

$D_{t-1}$ = Dividend per share for year t-1.

## 3.13 A Brief Discussion on Dividend Policies of Indian Companies

**Q44. Explain dividend policies impact on Indian Companies.**

*Ans :*

Most of the Indian companies pursue three types of policies while paying dividends.

**1. Generous Dividend and Bonus Policy**

Firms which follow this policy reward the shareholders generously by stepping up the total dividend payment over the time. Typically these firms maintain the dividend rate at a certain level say 15 to 20 % an issue bonus shares when the reserves position and earning potential permit. Such firms naturally have a strong share holder orientation.

**2. More or Less Fixed Dividend Policy**

Some firms have a target dividend rate which is usually in the range of 10 to 20% which they consider as a reasonable compensation to equity share holders Such firm normally do not issue bonus share, Infrequently may be once in a few years, the dividend rate may be raised slightly to provide somewhat higher compensation to equity shareholders to match the higher returns from other forms of investment.

**3. Erratic Dividend Policy**

Firms which follow this dividend policy seem to be indifferent to the welfare of equity shareholders. Dividends are paid erratically whenever the management believes that it will not strain resources. Bhat and Pandey conducted survey to ascertain the perceptions of Indian managers about dividend decisions. The top five determinants of dividend policy according to the Indian managers are

a. Current earnings

b. Pattern of the past dividends

c. Expected future earnings

d. Increasing equity base

e. Liquidity

They consider industry practices as the least important factor. Managers perceive that the dividend policy influences the share price, although they do not consider the rationale for paying dividends to be maintaining or increasing share price.

They do not think that dividend decision should be constrained by a firm’s capital expenditures. In their opinion investors are not indifferent to dividends and capital gains. Managers in India strongly believe that a company should strive to maintain an uninterrupted record of dividend payments and follow a stable pattern of dividend payment.

They think that the companies should have target payout ratios, and should not change their dividend polices if they cannot maintain it. They feel that the current dividend depends in part on the current earnings and in part on dividend paid in the previous years. In the view of the managers, shareholders in low tax brackets prefer more dividends than low or no dividends.

They are however not sure if shareholders in high tax brackets prefer low dividends. They think that the payments of dividends helps to communicate the future prospects of the company and dividends should be paid even though companies may have fund requirements for investing in profitable investment opportunities.

# Exercise Problems

1. From the following selected data determine the value of firms M (levered) and (unlevered) which are belonging to the homogenous risk class under (i) NI and (ii) NOI approach ?

| Particulars | Firm - M (Levered) (`) | Firm - N(Unlevered) (`) |
|---|---|---|
| EBIT | 4,00,000 | 4,00,000 |
| Interest at 10% | 1,00,000 | —— |
| Equity capital cost | 15% | 15% |
| Corporate tax | 50% | 50% |

Which of the two firms is optimal capital structure?

**[Ans : $K_o$ Under NI : Firm – M (Levered) - 20%; Firm – N (Unlevered) 30%. $K_o$ Under NOI : Firm – M(Levered) – 22%; Firm – N(Unlevered – 30%]**

2. From the following data, find out the value of firms Excel Ltd. and Hawell Led. belonging to the same risk class :

| Particulars | Excel Limited | Howell Limited |
|---|---|---|
| EBIT | ` 4,50,000 | ` 4,50,000 |
| Interest at 15% | 1,50,000 | – |
| Equity Capitalisation Rate ($K_c$) | 20% | – |
| Corporate Tax Rate | 50% | |

Which of the two firms has an optimal capital structure under NOI approach?

**[Ans : Use MM Model with taxes; Firm Excel has optimal capital structure. Its $K_e$ = 29% and $K_o$ = 13.85%; Value ` 16,25,000 and 11, 25,000]**

3. The capital structure of a textile company is as follows :

| Particulars | ` |
|---|---|
| 10% Debentures | 5,00,000 |
| 12% Preterence Shares | 1,00,000 |
| Equity shares of ` 10 each | 4,00,000 |
| Operating profit (EBIT) | 1,60,000 |

Corporate tax rate is at 50%

Determine :

i) The firm's EPS

ii) The degree of financial leverage,

iii) The percentage change in EPS associated with 30% decrease in EBIT.

**[Ans : EPS = ` 1.075; Degree of Financial Leverage = 1.86; Change in EPS with 30% increase = 55.81% with 30% decrease = (–) 55.81%)**

4. Calculate the Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL). and the Degree of Combined Leverage (DCL) for the following firms :

| Particulars | Firm X | Firm Y | Firm X |
|---|---|---|---|
| Output (Units) | 60,000 | 15,000 | 1,00,000 |
| Fixed Costs (`) | 7,000 | 14,000 | 1,500 |
| Variable Cost Per Unit (`) | 0.20 | 1.50 | 0.02 |
| Interest on Borrowed Funds(`) | 4,000 | 8,000 | - |
| Selling Price Per Unit (`) | 0.60 | 5.00 | 0.10 |

**[Ans : Degree of Operating Leverage Firm X–141; Y–1.36; Z–1.23 Degree of Financial Leverage Firm X – 1.31; Y – 1.26; Z – 1.00 Degree of Combined Leverage Firm X – 1.85; Y – 1.72; Z – 1.23]**

5. The following figures relate to two companies.

| Particulars | P. Ltd (` in lac) | Q. Ltd (` in lac) |
|---|---|---|
| Sales | 500 | 1,000 |
| Variable costs | 200 | 300 |
| Contribution | 300 | 700 |
| Fixed costs | 150 | 400 |
| EBIT 150 | 150 | 300 |
| Interest | 50 | 100 |
| Profit before tax | 100 | 200 |

You are required to calculate the operating, financial and combined leverage for the two companies.

**[Ans : Degree of Operating Leverage, P-2; Q-2.33;**

**Degree of Financial Leverage P-1.5; Q-1.5;**

**Degree of Combined Leverage P-3; Q-3.5]**

6. A company earns ` 6 per share having capitalisation rate of 10 per cent and has a return on investment at the rate of 20 per cent. According to Walter's model, what should be the price per share at 30 per cent dividend pay-out ratio? Is this the optimum pay-out ratio as per Walter model?

   **[Ans: P = ` 102]**

7. The earning per share of company are ` 12 and the rate of capitalization applicable to the company is 10%. The productivity of earning (r) is 10%. Compute the market value of Company, if the payout ratio is (a) 25% (b) 50% (c) 75%.

   **[Ans: If dividend Payout is 25% - ` 120; If dividend Payout is 50% - ` 120; If dividend Payout is 75% - ` 120]**

8. G limited has invested ` 500 lakhs in assets. There are 50 lakhs shares outstanding. The par value per share is ` 10. It earns a rate of 15% on its investment and has a policy of retaining 50% of earnings. If the appropriate discount rate of the company is 10%. what is the price of its shares using the Gordon's model? What will happen to the price of the share if the company has a pay-out of 80% or 20%?

   **[Ans: If dividend Payout is 50 % - ` 30; If dividend Payout is 80 % - `17.14; If dividend Payout is 20 % - ` (-)15]**

9. The MNC Ltd.'s available information is:

   K = 15% E = ` 30

   (1) r =14%, (2) r =15%, and (3) r =16%

   You are required to calculate market price of a share of the MNC Ltd. As per Gordon model if:

   (1) b = 40%, (2) b = 60%. and (3) b = 80%

   **[Ans: Market price of stock:**

   When b = 40% r = 14% ` 191.49, r= 15% ` 200, r = 16% ` 209.30

   When b = 60% r = 14% ` 181.82, r= 15% ` 200, r = 16% ` 222.22

   When b = 80% r= 14% ` 157.89, r= 15% ` 200, r= 16% ` 272.73]



10. The overall cost of capital of a company is 10%. It has currently 2,500 outstanding shares selling at ` 100 each. The firm is contemplating the declaration of dividends of ` 5 per share at the end of the current financial year. It experts to have a net income of ` 2,50,000 and has a proposal for making new investments of ` 5,00,000. Show that under MM assumptions, the payment of dividend does not affect the value of the firm.

    **[Ans: Value of the firm when dividends are paid - ` 2,500,000: Value of the firm when dividends are not paid - ` 2,500,000]**

# Short Question and Answers

**1. Define capital structure ?**

*Ans :*

Capital structure in simple words refers to debt equity ratio of a company. In other words it refers to the proportion of debt in the investments of the company. It is important for a company to have an appropriate capital structure. Estimation of capital requirements is necessary, but the formation of capital structure is important.

**Definition :**

**According to Gerestenbeg,** "Capital structure of a company refers to the composition or make-up of its capitalization and it includes all long term capital resources i.e., loans, reserves, shares and bonds.

The capital structure is made up of debt and equity securities and refers to permanent financing of a firm. It is composed of long term debt, preference share capital and share holder's funds.

Financial Manager should develop an appropriate capital structure, which is helpful to maximize shareholders wealth. This can be possible when all factors which are relevant to the company's capital structure are properly analyzed, balanced and considered.

**2. Optimal capital Structure ?**

*Ans :*

An optimal or sound capital structure can be properly defined as that combination of debt and equity that attains, the stated managerial goal in the most relevant manner-the maximization of the firm's market value. Moreover, the optimal capital structure is also defined as the combination of debt and equity that minimizes the firms cost of capital.

Hence the optimal capital structure is concerned with the two important variables at one time-the minimization of cost as well as maximization of worth. These desired objectives can be achieved only with the help of a sound capital structure possessing the following characteristics :

**1) A Conservative Capital Structure**

An attempt should be made to secure as far as possible a conservative capital structure consisting of high grade securities. By doing so, the management should decide on the form of securities to be issued only after a thorough consideration of the possible effects of the proposed securities on the firm, its credit, value of other securities Issue of securities in the future, maintenance of profits and future rearrangement of its financial structure etc.

Such capital structure offers certain decisive advantages to the company, namely, the company's cost of financing is the least, its prospects for raising capital even in unfavourable views are good and it can maintain healthy relations with security holders.

**2) A Simple Capital Structure**

As far as possible, a simple capital structure should be preferred to A complicated one. It is easy to manage it The investors have a very clear picture of their rights and worth of their investments.

**3) Minimum Remuneration**

As far as possible, the fixed cost burden on the income statement of the firm must be low. To achieve this aim, a proper policy of trading on equity should be followed.

**4) Profitability**

The capital structure of the company should be most advantageous. Within the constraints, maximum use of average at a minimum cost should be made.

**3. Define over capitalization ?**

*Ans :*

A company is over-capitalized when its earnings are consistently insufficient to yield a fair rate of return on the amount of capitalization of a company and when it is not in a position to pay interest on debentures and long-term borrowing, while dividends on shares are not at fair rates, it is said to be overcapitalized. This situation arises when a company raises more capital than what is justified by its actual earnings. Over capitalization does not necessarily mean abundance or excess of capital.

An over-capitalized company may be short of capital. A company may be over-capitalized because its capital is not effectively utilized, thus causing a constant decline in earnings. This leads to the inability of the company to pay normal rate of dividend and interest on shares and debentures respectively. It leads to fall in the market value of its shares. A company is overcapitalized if it has been unable to earn a fair or prevailing rate of return on its capital, and the market value of its shares is lower than the book value over a fairly long period of time.

### Definitions of Over-Capitalization

1. **According to C.W. Gerstenberg** "A corporation is over – capitalized when its earnings are not large enough to yield a fair return on the amount of stocks and bonds that have been issued, or when the amount of securities outstanding exceeds the current value of the assets".
2. **According to Harod Gilbert** "When a company has consistently been unable to earn the prevailing rate of return on its outstanding securities (considering the earnings of similar companies in the same industry and the degree of risk), it is to be over-capitalized".
3. **According to Hoagland** Whenever the aggregate of the par value of stock and bounds outstanding exceeds the true value of fixed assets, the corporation is said to be over-capitalized".

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### 4. Leverage.

*Ans :*

Leverage is the capability of a firm to make use of fixed cost assets or funds in order to increase the returns to the equity shareholders.

According to James Home, leverage is defined as "The employment of an asset or sources of funds for which the firm has to pay a fixed cost or fixed return".

There exists a direct relationship between degree of leverage, risk and return to the shareholders. Leverage can be classified into, operating and financial leverage.

#### Income Statement Format

| | | | |
|---|---|---|---|
| Operating leverage | Sales | xxx | Total leverage |
| | – variable | –xx | |
| | Cost | xxx | |
| | – Fixed cost | –xx | |
| | EBIT | xxx | |
| Financial leverage | – Interest | –xx | |
| | EBT/PBT | xxx | |
| | – Taxes | –xx | |
| | EAT/PAT | xxx | |
| | – Dividend | –xx | |
| | Retained earnings | xxx | |

#### Types of Leverage

There are basically three types of Leverage:

1. Operating Leverage OL (Equity)
2. Financial Leverage FL (Debt/Loan)
3. Combined Leverage CL ( Operating and financial)

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### 5. Define financial leverage.

*Ans :* **(Aug.-17)**

Financial leverage is concerned with financing activities of a firm. According to Gitman, it is defined as the "ability of a firm to use fixed financial charges to magnify the effects of changes in EBIT on the earnings per share". It results from the use of fixed cost financing and also specify the extent to which the Earnings Per Share (EPS) will be affected with the change in Earning Before Interest and Tax (EBIT).

#### Favourable of Financial Leverage

The impact of financial leverage can be favourable or unfavourable. When firm yields more profits on the assets acquired with the funds than the fixed cost of their use. Then it is a favourable or positive leverage and when firm does not earn profits even equal to the cost of funds then it is called as unfavourable or negative leverage.

The degree of financial leverage evaluates the effect of change in operating income (EBIT) on change in earning capital or on equity share. Degree of financial leverage is calculated as,

$$DFL = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

Alternatively, it can be calculated as,

$$DFL = \frac{EBIT}{EBT\,(EBIT - I)}$$

Financial leverage is used to plan the proportion of debt and equity in order to increase earning per share. Some of the importance of financial leverage are explained below.

**1. Designing of Capital Structure**

The capital structure involves raising of long-term funds, which can be raised from shareholders and long-term creditors. The financial manager is responsible to ascertain the proportion of fixed cost funds and equity share capital. The consequences of borrowing on cost of capital and financial risk involved must be considered before finalizing a capital structure.

**2. Profit Planning**

The degree of financial leverage have an impact on earning per share. With the increase in profitability of the firm, the availability of profits for equity stockholders increase with the help of fixed cost funds. Hence, financial leverage is an important element in profit planning.

### 6. Assumptions of Capital Structure.

*Ans :*

To study the relationship between capital structures (use of debt) and value of the firm, the following assumptions are generally made :

(i) Firm uses only two sources of funds: perpetual riskless debt and equity;

(ii) There are no corporate or income or personal tax;

(iii) The dividend payout ratio is 100% [There are no retained earnings];

(iv) The firm's total assets are given and do not change [Investment decision is assumed to be constant],

(v) The firm's total financing remains constant. [Total capital is the same, but proportion of debt and equity may be changed];

(vi) The firm's operating profits (EBIT) are not expected to grow;

(vii) The business risk remains constant and is independent of capital structure and financial risk;

(viii) All investors have the same subjective probability distribution of the expected EBIT for a given firm; and

(ix) The firm has perpetual life.

### 7. Net Income Approach.

*Ans :*

This approach has been developed by Durand. It is a relevant theory. According to this approach, capital structure decision is relevant to the valuation of the firm. In other words, a change in debt proportion in capital structure will lead to a corresponding change in cost of capital ($K_o$) as well as total value of the firm.

**Assumptions**

Net income approach is based on the following assumptions :

i) There are no taxes;

ii) Cost of debt is less than the cost of equity;

iii) Use of debt in capital structure does not change the risk perception of investors.

iv) Cost of debt and cost of equity remains constant;

**8. Walter's Model.**

*Ans :*

Walter's model believes that dividends are relevant because dividends influence the value of the firm. According to Walter, firm cannot be isolated from its dividend policy because they are associated with each other.

The Walter's model is supported by important statements like there exists a relationship between internal rate of return (r) and cost of capital (k) which influence an optimum dividend policy of a firm. When internal rate of return is more than the cost of capital ($r > k$) then firm must preserve its earnings and when internal rate of return is less than cost of capital ($r < k$) then firm must distribute its earnings to shareholders as dividends. In the situation when $r > k$, the optimum pay out will be zero which results in increase in the value of the shares. And when $r < k$, the firm distributes all its earnings and optimum pay out will be 100%.

**9. Gordon Model.**

*Ans :*

Gordon's model was developed by Myron Gordon. This model believes that dividends are relevant and dividend decision has an impact on firm value. Gardon supports Walter's model in analysis of relationship between dividend policy and valuation of firm. Gordon's model is based on following assumptions,

1. It is assumed that firm is an all-equity firm and all investments are financed through retained earnings.
2. It is assumed that firm has a perpetual life and there are no corporate taxes.
3. The cost of capital is constant and more than the growth rate.
4. The internal rate of return remains constant.
5. Firm decides a retention ratio and it remains constant.

**10. Limitations of Gordon Model.**

*Ans :*

1. This model is purely quantitative as it does not consider qualitative factors such as industry trends or trends in management strategy.
2. The Gordon growth model is highly sensitive to the inputs having an impact on growth rate.
3. If Gordon model is not used properly then it may generate misleading and irrational results. Due to the fact that value of dividends may becomes infinite when the growth rate converges on the discount rates.
4. This model is suitable only when growth rate is constant and if growth rate exceeds the required rate of return then Gordon model may not be suitable for the determination of value of dividends.
5. In Gordon model, calculations are based on the assumption that future dividends will grow at a constant rate forever.
6. This model is not suitable for rapidly growing industries which have less predictable dividend patterns.

**11. Explain the major forms of dividend.**

*Ans :*

Dividend can be categorized into different forms. Usually, the dividends paid in business are termed as profit dividends, whereas liquidation dividends are those dividends which are drawn out of capital. On the basis of terms in which they are paid, dividends can be explained as follows,

**a) Cash Dividend**

A common method followed by many companies in paying the dividend to their shareholders is cash dividend. Company must have sufficient liquid assets/resources to overcome the negative impact of payment of cash dividend. Payment of dividend in cash leads to reduction in net profit of the company because of outflow of funds.

**b) Scrip (or) Bond Dividend**

A scrip dividend guarantees the shareholder to pay the dividend in future on specific date. When there is insufficient funds in the company then company will issue bonds for due amount to shareholders to pay in future. The main purpose of scrip dividend is to delay instant payment of cash. It is recognized as collateral security and yields interest on it.

**c) Property Dividend**

This form of dividend is not famous in India. It is very rare that company pay dividend in the form of assets or its products. It happens only when there is insufficient funds.

**d) Stock Dividend**

In times of insufficient liquid resources, company issue bonus shares which is known as stock dividend. Stock dividend leads to capitalization of profits and also distribute profits to prevailing shareholders without having any impact on the cash of the firm.

**12. What is share split ?**

*Ans :*

Share split can be done only by publicly - traded companies which have a number of shares outstanding on the stock market. Stock split is the action of corporate to reduce the par value of stock and increase the number of shares proportionately.

Share split is a decision by the company's Board of Directors (BoDs) to increase the number of shares that are outstanding by issuing more shares to the current shareholders.

**Objectives Behind Stock Split**

The primary motive behind stock split is to make shares more affordable to small investors without changing the value of the company.

But sometimes stock split can also result in a stock price increase following the decrease immediately after the split. Since many small investors come forward to buy stock and boosting demand for shares, which lead to share price increase. Another reason for stock price increase is that a stock split provides a signal to the market that the company's share price has been increasing and people assume this growth will continue in the future, and again lift demand and increases share price. With the above we can understand that companies can achieve the objective of bringing share price to an affordable level for a short period only (immediately after stock split.

UNIT IV

**Working Capital Management and Finance:** Working Capital Management: Components of working capital, gross vs. net working capital, determinants of working capital needs, the operating cycle approach. Planning of working capital, Financing of working capital through Bank finance and Trade Credit, regulation of bank finance.

## 4.1 Working Capital Management

**Q1. Explain the meaning of working capital.**

*Ans :* **(May-19, Dec.-18)**

**Meaning of Working Capital**

Working Capital refers to the cash a business requires for day-to-day operations, (or) more specifically, for financing the conversion of raw materials into finished goods, which the company sells for payment. Among the most important items of working capital are levels of inventory, debtors and creditors. These items are looked at for signs of a company's efficiency and financial strength.

**Definition of Working Capital**

**(i)** **According to Shubin,** "Working capital the amount of funds necessary to cover the cost of operating the enterprise".

**(ii)** **According to Gerstenberg,** "Circulating capital means current assets of a company that are changed in the ordinary course of business from one form to another, as **for example,** from cash to inventories, inventories to receivables, receivables into cash".

**(iii)** **According to Hoagland,** "Working capital is descriptive of that capital which is not fixed. But, the more common use of working capital is to consider it as the difference between the book value of the current assets and the current liabilities".

Working capital, in general practice, refers to the excess of current assets over current liabilities. Management of working capital therefore, is concerned with the problems that arise in attempting to manage the current assets, the current liabilities and the inter-relationship that exists between them. In other words it refers to all aspects of administration of both current assets and current liabilities. It is also known as revolving or circulating capital or short-term capital.

Working capital management is very important to ensure that the company has enough funds to carry on with its day-to-day operations smoothly. A business should not have a very long Cash Conversion Cycle. A cash conversion cycle measures the time period for which a firm will be deprived of funds if it increases its investments as a part of its business growth strategies.

**Q2. Explain different kinds of working capital.**

*Ans :* **(May-19, Dec.-18, Feb.-17)**

Working Capital may be classified in two ways:

A) On the basis of concept

B) On the basis of time.

**A. On the Basis of Concept**

On the basis of concept, working capital is classified as gross working capital and net working capital

**1. Gross Working Capital**

Gross working capital refers to the amount which the company has invested into the current assets. Examples of current assets are:

**Constituents of Current Assets**

1. Cash in hand and bank balances,
2. Bills Receivables,
3. Sundry Debtors (less provision for bad debts),
4. Short- term loans and advances.
5. Inventories of stocks, as:
   i) Raw materials.
   ii) Work-in-process,
   iii) Stores and spares.
   iv) Finished goods.
6. Temporary Investment of surplus funds,
7. Prepaid Expenses,
8. Accrued Incomes.

**2. Net Working Capital**

Net working capital refers to the difference between the current assets and current liabilities of the company.

Net Working Capital = Current Assets – Current liabilities

Examples of current liabilities are :

**Constituents of Current Liabilities**

1. Bills Payable,
2. Sundry Creditors or Accounts Payable,
3. Accrued or Outstanding Expenses,
4. Short-term loans, advances and deposits,
5. Dividends Payable,
6. Bank Overdraft,
7. Provision for taxation, if it does not amount to appropriation of profits.

As one can see from the above that both gross working capital and net working capital are different because under gross working capital one calculate the amount which the company has invested into current assets, which implies that current liabilities are excluded while calculating gross working capital, which is not the case under net working capital where one calculate the difference between current assets and current liabilities.

**B. On the Basis of Time**

On the basis of time, working capital is classified as

**(a) Permanent or Fixed Working Capital:** Permanent or fixed working capital is the minimum amount which is required to ensure effective utilizations of fixed facilities and for maintaining the circulation of current assets. There is always a minimum level of current assets which is continuously required by the enterprise to carry out its normal business operations.

**(b) Temporary or Variable Working Capital:** Temporary or variable Working Capital is the amount of Working Capital which is required to meet the seasonal demands and some special exigencies. Variable Working Capital can be further divided as seasonal Working Capital and special Working Capital.

Most of the enterprises have to provide additional Working Capital to meet special exigencies such as launching of extensive marketing campaigns for conducting research, etc.

Temporary Working Capital differs from permanent Working Capital in the sense that it is required for short periods and cannot be permanently employed gainfully in the business.

**Q3. Explain the Importance of Working Capital.**

*Ans :* **(Feb.-17)**

Working capital is the life blood and nerve centre of a business. Working capital is very essential to maintain the smooth running of a business. No business can run successfully without an adequate amount of working capital. The main advantages of maintaining adequate amount of working capital are as follows :

**(a) Solvency of the business**

Adequate working capital helps in maintaining solvency of the business providing uninterrupted flow of production.

**(b) Goodwill**

Sufficient working capital enables a business concern to make prompt payments and hence helps in creating and maintaining goodwill.

**(c) Easy Loans**

A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and others on easy and favorable terms.

**(d) Cash Discounts**

Adequate working capital also enables a concern to avail cash discounts on the purchases and hence it reduces costs.

**(e) Regular supply of raw materials**

Sufficient working capital ensures regular supply of raw materials and continuous production.

**(f) Exploitation of favourable market conditions**

Only concerns with adequate working capital can exploit favourable market conditions such as purchasing its requirements in bulk when the prices are lower and by holding its inventories for higher prices.

**(g) Ability to face crisis**

Adequate working capital enables a concern to face business crisis in emergencies such as depression because during such periods, generally, there is much pressure on working capital.

**(h) Quick and regular return on investments**

Every investor wants a quick and regular return on his investments. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors as there may not be much pressure to plough back profits. This gains the confidence of its investors and creates a favourable market to raise additional funds in the future.

**i) High morale**

Adequacy of working capital creates an environment of security, confidence, high morale and creates overall efficiency in a business.

## 4.2 Components of Working Capital

**Q4. Explain the components of working capital.**

*Ans :* **(July-18)**

Efficient management of working capital involves effective control over the current assets and current liabilities which are the main components of working capital.

**1. Components of Current Assets**

Current assets are those assets that, in the ordinary course of business, can be turned into cash within an accounting period (not exceeding over one) without undergoing diminution in value and without disrupting the operations. Current assets consists of cash, marketable securities, inventories, sundry debtors, one- year fixed deposits with banks, prepaid expenses.

**2. Components of Current Liabilities**

Current liabilities are those liabilities intended to be paid in the ordinary course of business within a reasonable period (normally within a year) out of the current assets or revenue of the business. The current liabilities consist of sundry creditors, loans and advances, bank over-draft, short-term borrowings, taxes and proposed dividend.

## 4.3 Gross vs. Net Working Capital

**Q5. Differences between Gross Vs Net Working Capital.**

**(OR)**

**Compare and contrast Gross Vs Net Working Capital.**

*Ans :* **(July-18, Aug.-17)**

| S.No. | Gross working capital (GWC) | Net Working Capital (NWC) |
|---|---|---|
| 1. | Gross Working Capital (GWC) refers to that amount of investment which has been invested by the firm in financing its current assets. | Net Working Capital (NWC) refers to the net amount which could be obtained by deducting the current liabilities from the current assets. i.e., $\boxed{\text{NWC} = \text{Current assets} - \text{Current liabilities}}$ |
| 2. | As it mainly deals with current assets, they can be easily converted into cash within an accounting year (which is usually less than an year). Example : Cash, debtors, bills receivable, stock etc. | As it represents a differential amount, which is actually the amount of investment made in current assets that have been financed by the long-term sources. |
| 3. | Through, gross working capital the liquidity position of the firm can be determined. Because of this liability, it is found to be of managerial interest. | Net working capital is highly significant as it enables the firm to meet its future needs. |
| 4. | If high amount is vested in the maintenance of gross working capital, then the firm is exposed to high risk of obsolescence. | If high amount is vested in the maintenance of net working capital, liquidity position of a firm can be considerably improved. |
| 5. | It helps the firm in maintaining the right amount of working capital at the right time. | It helps in maintaining the equilibrium or trade off between the current assets and the current liabilities. |
| 6. | It is suitable to the company form of organisation wherein the ownership management is separated from its control. | It is suitable for all types of business. However, its need varies based on the nature of a business. |
| 7. | The gross concept is based on an assumption that a small increase in the amount of funds causes even the working capital to increase. | It represents the liquidity position of a firm to their short-term creditors. |



## 4.4 Determinants of Working Capital Needs

**Q6. Explain the factors determining the Working Capital requirements ?**

*Ans :* **(Aug.-17)**

The Working Capital requirements of a concern depend upon a large number of factors such as nature and size of business, the character of their operations, the length of production cycles, the rate of stock turnover and the state of economic situation. It is not possible to rank them because all such factors are of different importance and the influence of individual factors changes for a firm over time. The following are the important factors generally influencing the Working Capital requirements:

**(a) Nature (or) character of business**

The Working Capital requirements of a firm basically depend upon the nature of its business. Public utility undertaking like Electricity, Water Supply and Railways need very limited Working Capital because they offer cash sales only and supply services, not products, and as such no funds are tied up in inventories and receivables. The trading and financial firms require less investment in fixed assets but have to invest large amounts in current assets like inventories, receivables and cash; as such they need large amount of Working Capital.

**(b) Size of business / Scale of operations**

The Working Capital requirements of a concern are directly influenced by the size of its business which may be measured in terms of scale of operations. Greater the size of a business unit, larger will be the requirements of Working Capital. In some cases even a smaller concern may need more Working Capital due to high overhead charges, inefficient use of available resources and other economic disadvantages of small size.

**(c) Production policy**

In certain industries the demand is subject to wide fluctuations due to seasonal variations. The requirements of Working Capital, in such cases depend upon the production policy. The production could be kept either steady by accumulating inventories during slack periods with a view to meet high demand during the peak season or the production could be curtailed during the slack season and increased during the peak season. If the policy is to keep production steady by accumulating inventories it will require higher Working Capital.

**(d) Manufacturing process/length of production cycle**

In manufacturing business, the requirements of Working Capital increase in direct proportion to length of manufacturing process. Longer the process period of manufacture, larger is the amount of Working Capital required. The longer the manufacturing time, the raw materials and other supplies have to be carried for a longer period in the process with progressive increment of labour and service costs before the finished product is finally obtained. Therefore, if there are alternative processes of production, the process with the shortest production period should be chosen.

**(e) Seasonal variations**

In certain industries raw material is not available throughout the year. They have to buy raw materials in bulk during the season to ensure an uninterrupted flow and process them during the entire year. A huge amount is, thus, blocked in the form of material inventories during such season, which gives rise to more Working Capital requirements. During the busy season , a firm required larger Working Capital than in the slack season.

**(f) Working capital cycle**

In a manufacturing concern, the Working Capital cycle starts with the purchase of raw material and end with the realisaion of cash from the sale of finished products. This cycle involves purchase of raw materials and stores, its conversion into stocks of finished goods through work-in-progress with progressive increment of labour and service costs, conversion of finished stock into sales, debtors and receivables and ultimately realization of cash an this cycle continues again from cash to purchase of raw material and so on.

**(g) Rate of stock turnover**

There is a high degree of inverse co-relationship between the quantum of

Working Capital and the velocity or speed with which the sales are effected. A firm having a high rate of stock turnover will need lower amount of Working Capital as compared to a firm having a low rate of turnover.

**(h) Credit Policy**

The credit policy of a concern in its dealings with debtors and creditors influence considerably the requirements of Working Capital. A concern that purchases its requirements on credit and sells its products/ services on cash requires lesser amount of Working Capital. A concern buying its requirements for cash and allowing credit to its customers, shall need larger amount of Working Capital as very huge amount of funds are bound to be tied up in debtors or bills receivables.

**(i) Business cycle**

Business cycle refers to alternate expansion and contradiction in general business activity. In a period of boom i.e. when the business is prosperous, there is a need for larger amount of Working Capital due to increase in sales, rise in prices, optimistic expansion of business etc. In the times of depression i.e. when there is a down swing of this cycle, the business contracts, sales decline, difficulties are faced in collections from debtors and firms may have a large amount of Working Capital lying idle.

**(j) Rate of growth of business**

The Working Capital requirements of a concern increase with the growth and expansion of its business activities. Although, it is difficult to determine the relationship between the growth in the volume of business and the growth in the Working Capital of a business, yet it may be concluded that for normal rate of expansion in the volume of business, we may have retained profits to provide for more Working Capital but in fast growing concerns, we shall require larger amount of Working Capital.

**(k) Earning capacity and dividend policy**

Some firms have more earning capacity than others due to quality of their products, monopoly conditions etc. Such firms with high earning capacity may generate cash profits from operations and contribute to their Working Capital. The dividend policy of a concern also influences the requirements of its Working Capital. A firm that maintains a steady high rate of cash dividend irrespective of its generation of profits needs more Working Capital than the firm that retains larger part of its profits and does not pay so high rate of cash dividend.

**(l) Price level changes**

Changes in the price level also affect the Working Capital requirements. The rising prices will require the firm to maintain large amount of working capital as more funds will be required to maintain the same current assets. The effect of rising prices may be different for different firms, Some firms may be affected much while some others may not be affected at all by the rise in prices.

**Q7. Explain the advantages and dis-advantages of working capital cycle.**

*Ans :*

**Advantages of Working Capital**

The main advantages of maintaining adequate amount of working capital are as follows:

**1. Cash Discount**

If a proper cash balance is maintained, the business can avail the advantage of cash discount by paying cash for the purchase of raw materials and merchandise. It will result in reducing the cost of production.

**2. Creates a Feeling of Security and Confidence**

The proprietor or officials or management of a concern are quite carefree, if they have proper working capital arrangements because they need not worry for the payment of business expenditure or creditors. Adequate working capital creates a sense of security, confidence and loyalty, not only throughout the business itself, but also among its customers, creditors and business associates.

**3. 'Must' for Maintaining Solvency and Continuing Production**

In order to maintain the solvency of the business, it is but essential that the sufficient amount of fund is available to make all the payments in time as and when they are due. Without ample working capital, production will suffer, particularly in the era of cut throat competition, and a business can never flourish in the absence of adequate working capital.

**4. Sound Goodwill and Debt Capacity**

It is common experience of all prudent businessmen that promptness of payment in business creates goodwill and increases the debt of the capacity of the business. A firm can raise funds from the market, purchase goods on credit and borrow short-term funds from bank, etc. If the investor and borrowers are confident that they will get their due interest and payment of principal in time.

**5. Easy Loans from the Banks**

An adequate working capital i.e. excess of current assets over current liabilities helps the company to borrow unsecured loans from the bank because the excess provides a good security to the unsecured loans, Banks favour in granting seasonal loans, if business has a good credit standing and trade reputation.

**6. Distribution of Dividend**

If company is short of working capital, it cannot distribute the good dividend to its shareholders inspite of sufficient profits. Profits are to be retained in the business to make up the deficiency of working capital. On the other contrary, if working capital is sufficient, ample dividend can be declared and distributed. It increases the market value of shares.

**7. Exploitation of Good Opportunity**

In case of adequacy of capital in a concern, good opportunities can be exploited e.g., company may make off-season purchases resulting in substantial savings or it can fetch big supply orders resulting in good profits.

**8. Meeting Unseen Contingency**

Depression shoots the demand of working capital because sock piling of finished goods become necessary. Certain other unseen contingencies e.g., financial crisis due to heavy losses, business oscillations, etc. can easily be overcome, if company maintains adequate working capital.

**9. High Morale**

The provision of adequate working capital improves the morale of the executive because they have an environment of certainty, security and confidence, which is a great psychological, factor in improving the overall efficiency of the business and of the person who is at the hell of fairs in the company.

**10. Increased Production Efficiency**

A continuous supply of raw material, research programme, innovations and technical development and expansion programmes can successfully be carried out if adequate working capital is maintained in the business. It will increase the production efficiency, which will, in turn increases the efficiency and morale of the employees and lower costs and create image among the community.

**11. Regular Supply of Raw Materials**

Sufficient working capital ensures regular supply of raw materials and continuous production.

**12. Regular Payment of Salaries, Wages and Other Day-to-Day Commitments**

A company which has ample working capital can make regular payment of salaries, wages and other day-to-day commitments which raises the morale of its employees, increases their efficiency, reduces wastage's and costs and enhances production and profits.

**Disadvantages of Working Capital**

The disadvantages suffered by a company with excessive working capital are as follows :

**1. Heavy Investment in Fixed Assets**

A concern may invest heavily in their fixed asset which is not justified by actual sales. This may create situation of over capitalisation.

**2. Reckless Purchase of Materials**

Inventory is purchased recklessly which results in dormant slow moving and obsolete inventory. At the same time it may increase the cost due to mishandling, waste, theft, etc.

**3. Speculative Tendencies**

Speculative tendencies may increase and if profit is increased dividend distribution will also increase. This will hamper the image of a concern in future when speculative loss may start.

**4. Liberal Credit**

Due to liberal credit, size of accounts receivables will also increase. Liberal credit facility can increase bad debts and wrong practices will start, regarding delay in payments.

**5. Carelessness**

Excessive working capital will lead to carelessness about costs which will adversely affect the profitability.

## 4.5 The Operating Cycle Approach

**Q8. What is an operating cycle ?**

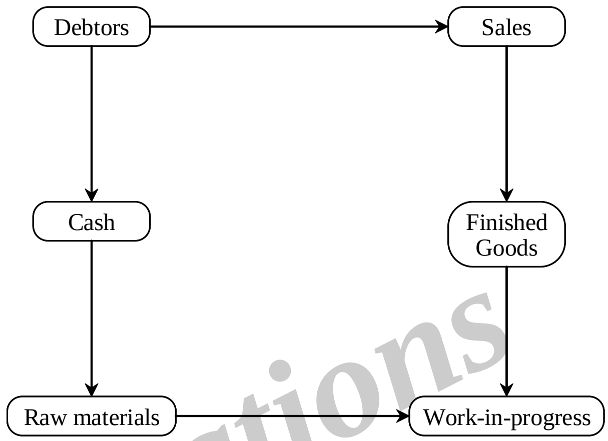
**(OR)**

**Explain the operating cycle approach to working capital.**

*Ans :* **(Aug.-17)**

The operating cycle implies the stages or processes through which the raw materials are processed to get the final product. If the process is lengthy and takes long time to get the finished products, the requirements of working capital will be much larger than that of a unit which has a relatively low operating cycle. The shortest manufacturing process will minimise the investment in the form of work-in-progress.

**Operating cycle of a manufacturing firm**




Requirements of working capital of a firm can be estimated by multiplying the duration of the operating cycle by cost of operations. The time period for completion of operating cycle is evaluated by, O = R + W + F + AP

Where,

O - Time period of operating cycle

R - Duration of raw material

W - Duration of work in progress

F - Duration of finished goods inventory

A - Duration of accounts receivable

P - Duration of accounts payable.

Formula to calculate the duration of raw material is,

$$R = \frac{\text{Average stock of raw materials}}{\text{Raw material consumption per day}}$$

Formula to calculate the duration of work in progress is,

$$W = \frac{\text{Average work-in-progress inventory}}{\text{Average production per day}}$$

Formula to calculate the duration of finished goods is,

$$F = \frac{\text{Average finished goods inventory}}{\text{Per day sale of goods}}$$

Formula to calculate the duration of accounts receivable is,

$$A = \frac{\text{Average book debts}}{\text{Average credit sales per day}}$$

Formula to calculate the duration of accounts payable is,

$$P = \frac{\text{Average trade creditors}}{\text{Average credit purchases per day}}$$

## PROBLEMS ON OPERATING CYCLE

**1. The relevant financial information of a company is furnished below,**

| Particulars | Profit & Loss A/c data (` Lakhs) |
|---|---|
| Sales | 1000 |
| Cost of goods sold | 750 |

**Balance Sheet Data**

| Particulars | Beginning of 2013 (` Lakhs) | End of 2013 (` Lakhs) |
|---|---|---|
| Inventory | 110 | 120 |
| Accounts receivable | 140 | 150 |
| Accounts payable | 60 | 66 |

**(i) What is the length of operating cycle?**

**(ii) What is the length of cash cycle?**

**OR**

**The relevant financial information for Apex Ltd., is given below,**

| Profit & Loss A/c Data | ` (000) | Balance Sheet Data | Beginning 2013 ` (000) | End of 2013 ` (000) |
|---|---|---|---|---|
| Sales | 1000 | Inventory | 110 | 120 |
| Cost of goods sold | 750 | Accounts receivable | 140 | 150 |
| | | Accounts payable | 60 | 66 |

**What is the length of the operating cycle? The cash cycle.**

*Sol :* **(Aug.-13)**

Operating cycle = Inventory period + Accounts receivable period

$$\text{Inventory period} = \frac{\text{Average Inventory}}{\text{Annual Cost of Goods Sold / 365}}$$

$$= \frac{(110 + 120)72}{750 / 365} = \frac{115}{2.0547}$$

$$= 56 \text{ days}$$

$$\text{Accounts receivable period} = \frac{\text{Average Accounts Receivable}}{\text{Annual Sales / 365}}$$

$$= \frac{(140 + 150) / 2}{1000 / 365}$$

$$= \frac{145}{2.739} = 52.9 \text{ days}$$

$$\text{Accounts payable period} = \frac{\text{Average Accounts Payable}}{\text{Annual Cost of Goods / 365}}$$

$$= \frac{(60 + 66) / 2}{750 / 365}$$

$$= \frac{63}{2.054} = 30.7 \text{ days}$$

Length of the Operating cycle = 56 + 52.9 = 108.9 days

$$\boxed{\text{Length of the Cash cycle} = \text{Operating cycle} - \text{Accounts payable period}}$$

$$= 108.9 - 30.7$$

$$= 78.2 \text{ days}$$

**2. The following are the figures on the basis of which you have to compute the length of the following,**

**(a) Gross operating cycle and**

**(b) Net operating cycle.**

**Raw material inventory ` 9,00,000; raw material consumption: ` 45,00,000; work in process inventory: ` 3,50,000; cost of production: ` 51,00,000; finished goods inventory: ` 6,00,000; cost of goods sold: ` 52,00,000, credit sales: 48,00,000; debtors: ` 7,00,000; creditors: ` 9,00,000; credit purchases: ` 45,00,000.**

*Sol :* **(March-16)**

**1. Calculation of Duration of Raw Material Inventory Period**

$$= \frac{\text{Average stock of raw material}}{\text{Raw matenal consumption per day}} \times 365$$

$$= \frac{9,00,000}{45,00,000} \times 365$$

= 73 days.

**2. Calculation of Duration of Work-in-Progress**

$$= \frac{\text{Average work-in-progress inventory}}{\text{Annual cost of production per day}}$$

$$= \frac{3,50,000}{51,00,000} \times 365$$

= 25 days

**3. Calculation of Duration of Finished Goods**

$$= \frac{\text{Average finished goods inventory}}{\text{Annual cost of goods sold per day}}$$

$$= \frac{6,00,000}{52,00,000} \times 365$$

= 42 days

**4. Calculation of Duration of Accounts Receivables**

$$= \frac{\text{Average Accounts Receivables Debtors}}{\text{Annual Credit Sales per day}} \times 365$$

$$= \frac{7,00,000}{48,00,000} \times 365$$

= 53 days

**5. Calculation of Duration of Accounts Payables or (Payables deferral)**

$$= \frac{\text{Average trade creditors}}{\text{Annual credit purchases per day}} \times 365$$

$$= \frac{9,00,000}{45,00,000} \times 365$$

= 73 days

**(a) Gross Operating Cycle**

$$\boxed{\text{Gross operating cycle} = \text{Inventory conversion period} + \text{Debtor conversion period}}$$

= Raw Material + Working Progress + Finished Goods + Account Receivable

= 73 + 25 + 42 + 53

= 193 days

**(b) Net Operating Cycle or Cash Conversion Period**

$$\boxed{\text{Net operating cycle (or) Cash conversion period} = \text{Gross operating cycle} - \text{Payables deferral period}}$$

= 193 – 73

= 120 days.

## 4.6 Planning of Working Capital

**Q9. Explain various methods are used in estimation of working capital.**

*Ans :*

Working capital is an essential element of every business. It is necessary for a financial manager to estimate an adequate amount of working capital which is to be maintained in the business. Working capital requirements can be estimated with the help of following methods.

**1. Percentage of Sales Method**

The percentage of sales method is used to estimate the level of working capital requirement by considering past record. A relationship between sales and working capital is calculated for determining the quantum of working capital . This method is simple and easily understood but it is not appropriate in all situations. It is used for identifying short term changes in working capital in future.

**2. Regression Analysis Methods**

The regression analysis method is one of the statistical method used for estimating working capital requirements. In this method the average relationship between sales and working capital and its various components is identified with the help of least squares method and this relationship is expressed in following equation,

$y = a + bx$

Where,

a – Fixed component

b – Variable component

x – Sales

y – Inventory

n – Number of observation.

In order to find the values of a and b, firm needs to find the solution for the equation.

$y = na + bx$

**3. Explain the proforma of working capital.**

**(OR)**

**Prepare working capital format with its components.**

*Ans :* **(July-18)**

**Proforma of Working Capital Requirements**
**Statement of Working Capital Estimation**

| Particulars | Amount (`) | Amount (`) |
|---|---|---|
| **A. Estimation of Current Assets :** | | |
| i) Raw materials | XXX | |
| ii) Work-in-process | | |
| Raw materials (full cost) | XXX | |
| Direct labour (to the extent of completed stage) | XXX | |
| Overheads (to the extent of completed stage) | XXX | XXX |
| iii) Finished goods inventory | | XXX |
| iv) Debtors | | XXX |
| v) Cash balance required | | |
| **Total Current Assets (A)** | | **XXX** |
| **B. Estimation of Current Liabilities :** | | |
| i) Creditors | | XXX |
| ii) Expenses | | XXX |
| iii) Overheads | | XXX |
| Labour | | XXX |
| **Total Current Liabilities (B)** | | **XXX** |
| **C. Working Capital (A-B)** | | XXX |
| **Add:** Contingency (Percentage on working capital, i.e., C) | | XXX |
| D. Working Capital Required | | XXXX |



## PROBLEMS

**4. A proforma cost sheet of a company provides the following particulars :**

| Particulars | Amount per unit (Rs.) |
|---|---|
| **Raw materials cost** | **100.00** |
| **Director labour cost** | **37.50** |
| **Overheads cost** | **75.00** |
| **Total cost** | **212.50** |
| **Profit** | **37.50** |
| **Selling Price** | **250.00** |

The company keeps raw material in stock, on average for one month; work-in-progress, on an average for one week; and finished goods in stock, on an average for two weeks. The credit allowed by suppliers is three weeks and company allows four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses in two weeks.

The company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at Rs. 37,500.

**Required :** Prepare a statement showing estimate of Working Capital needed to finance an activity level of 1,30,000 units of production. Assume that production is carried on evenly throughout the year, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month. Work-in-progress stock is 80% complete in all respects.

*Sol :*

**Statement showing the estimate of working capital needed**

| Particulars | Rs. | Rs. |
|---|---|---|
| **Current Assets :** | | |
| (i) Stock of raw materials (1 month) $1,30,000 \times 100 \times \frac{4}{52}$ | | 10,00,000 |
| (ii) Work-in-progress (1 week) : | | |
| Raw materials $1,30,000 \times 100 \times \frac{1}{52} \times \frac{80}{100}$ | 2,00,000 | |
| Direct labour $1,30,000 \times 37.50 \times \frac{1}{52} \times \frac{80}{100}$ | 75,000 | |
| Overheads $1,30,000 \times 75 \times \frac{1}{52} \times \frac{80}{100}$ | 1,50,000 | 4,25,000 |
| (iii) Stock of finished goods (2 weeks) : | | |
| Raw materials $1,30,000 \times 100 \times \frac{2}{52}$ | 5,00,000 | |
| Direct labour $1,30,000 \times 37.50 \times \frac{2}{52}$ | 1,87,500 | |
| Overheads $1,30,000 \times 75 \times \frac{2}{52}$ | 3,75,000 | 10,62,500 |
| (iv) Debtors at cost (4 weeks) $1,30,000 \times \frac{4}{5} \times 212.50 \times \frac{4}{52}$ | | |
| (As 1/5th of output is sold against cash only $\frac{4}{5}$ of output is considered) | | 17,00,000 |
| (v) Cash in hand at bank (as given) | | 37,500 |
| **Total Current Assets (A)** | | **42,25,000** |

| | | |
|---|---|---|
| **Less : Current Liabilities** | | |
| (i) Creditors for raw material purchases | | |
| (3 weeks) $1,30,000 \times 100 \times \frac{3}{52}$ | | 7,50,000 |
| (ii) Wages outstanding (1 week) $1,30,000 \times 37.50 \times \frac{1}{52}$ | | 93,750 |
| (iii) Lag in payment of overheads (2 weeks) $1,30,000 \times 75 \times \frac{2}{52}$ | | 3,75,000 |
| **Total Current Liabilities (B)** | | **12,18,750** |
| Net Working Capital (A – B) | | 30,06,250 |

**5. Determine the working required to finance a level of activity of 1,80,000 units of output for a year. The cost structure is as under :**

| Particulars | Cost per unit (Rs.) |
|---|---|
| Raw Materials | 20 |
| Direct Labour | 5 |
| Overheads (including depreciation of Rs. 5) | 15 |
| **Total cost** | **40** |
| Profit | 10 |
| **Selling Price** | **50** |

**Additional Information :**

- Minimum desired cash balance is Rs. 20,000
- Raw materials are held in stock, on an average, for 2 months
- Work-in-progress (assume 50 per cent completion stage) will approximate to half-a-month production
- Finished goods remain in warehouse, on an average for a month
- Suppliers for materials extend a month's credit and debtors are provided 2 months credit. The cash sales are 25 per cent of total sales
- There is a time lag in payment of wages for a month and half-a-month in the case of overheads.

*Sol :*

**Estimation of Working Capital**

| | Particulars | Amount (in Rs.) | Amount (in Rs.) |
|---|---|---|---|
| **A.** | **Estimation of Current Assets** | | |
| | Raw materials : (1,80,000 × 20 × 2 / 12) | 6,00,000 | |
| | Work-in-process: $\left(\frac{1,80,000 \times 35 \times 0.5}{12} \times \frac{50}{100}\right)$ | 1,31,250 | |
| | Finished Goods: (1,80,000 × 35 × 1) / 12) | 5,25,000 | 12,56,250 |
| | Debtors (75% of total units produced): | | |
| | (1,35,000 × 35 × 21 / 12) | | 7,87,500 |
| | Cash Balance | | 20,000 |
| | **Total Current Assets (A)** | | 20,63,750 |
| **B.** | **Estimation of Current Liabilities** | | |
| | Suppliers: (1,80,000 × 20 × 1 / 12) | | 3,00,000 |
| | Wages: (1,80,000 × 5 × 1 / 12) | | 75,000 |
| | Overheads: (1,80,000 × 10 × 0.5 / 12) | | 75,000 |
| | **Total Current Liabilities (B)** | | 4,50,000 |
| **C.** | **Working capital (A – B)** | | 16,13,750 |

**6. You are supplied with the following information in respect of XYZ Ltd., for the ensuring year : Production of the year, 69,000 units.**

**Finished goods in store, 3 months**

**Raw material in store, 3 months**

**Raw material in store, 2 months**

**Consumption Production process 1 month**

**Credit allowed by creditors, 2 months**

**Credit given to debtors, 3 months**

**Selling price per unit, Rs.50**

**Raw material, 50 percent of selling price**

**Direct wages, 10 percent of selling price**

**Manufacturing and Administrative overheads, 16 per cent of selling price**

**Selling overheads 4 percent of selling price**

**There is a regular production an sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. You are required to ascertain its working capital requirement.**

*Ans :* **(July-18)**

Statement to determine net working capital for XYZ Ltd.

| S.No. | Particulars | Amount Rs. | Amount Rs. |
|---|---|---|---|
| (a) | Current Assets : | | |
| | (i) Raw materials in store $\left(69,000\times 25\times \frac{2}{12}\right)$ | 2,87,500 | |
| | (ii) Work in progress | | |
| | (a) Raw material | 1,43,750 | |
| | (b) Direct labours | 28,750 | |
| | (c) Over heads | 57,500 | |
| | (iii) Finished goods stock | 6,90,000 | |
| | (iv) Debtors | 6,90,000 | |
| | (v) Cash @ Bank | NIL | 18,97,500 |
| | Total current assets | | 18,97,500 |
| (b) | Current Liabilities | | |
| | (i) Creditors | 2,87,500 | |
| | (ii) Wages - lag in payment | 28,750 | |
| | Total current liability | | 3,16,250 |
| (c) | Net working capital (a – b) | | 15,81,250 |
| | Add : 10% contingency | | NIL |
| | Net working capital required | | 15,81,250 |

**<u>Working Notes</u>**

(i) Raw material in store = $\left(69,000\times 25\times \frac{2}{12}\right)$ = Rs. 2,87,500

(ii) Work -in-Progress

(i) Raw material = $\left(69,000\times 25\times \frac{1}{12}\right)$ = Rs. 1,43,750

(ii) Direct labour $= \left(69{,}000 \times 5 \times \frac{1}{12}\right)$ = Rs. 28,750

(iii) Over head $= \left(69{,}000 \times 10 \times \frac{1}{12}\right)$ = Rs. 57,500

(iii) Finished good stock $= \left(69{,}000 \times 40 \times \frac{3}{12}\right)$ = Rs. 6,90,000

(iv) Debtor $= \left(69{,}000 \times 40 \times \frac{3}{12}\right)$ = Rs. 6,90,000

(v) Creditor $= \left(69{,}000 \times 25 \times \frac{2}{12}\right)$ = Rs. 2,87,500

(vi) lag in payment of wages $= \left(69{,}000 \times 5 \times \frac{1}{12}\right)$ = Rs. 28,750

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**7. XYZ Ltd. information is given below**

**Production of the year 69,000 units**

**Finished goods in store, 3 months**

**Raw material in store 2 months consumption**

**Production process 1 month**

**Credit allowed by creditors, 2 months**

**Credit given to debtors, 3 months**

**Selling price per unit Rs. 50**

**Raw material 50 percent of selling price**

**Direct wages, 10 percent of selling price**

**Manufacturing and administrative overheads, 16 percent of selling price**

**Selling over heads, 4 percent of selling price**

**There is a regular production and sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. Calculate the working capital requirement.**

*Ans :* **(Dec.-19)**

**Estimation of Required Working Capital**

| Particulars | | Amount |
|---|---|---|
| A) Estimation of Current Assets: | | |
| (i) Raw Materials [69,000 × 25 × 2/12] | | 2,87,500 |
| Raw Materials price 50% of SP = 50 × 0.5] | | |

| | | | |
|---|---|---|---|
| | (ii) Work - in - progress [production Process] | | |
| | (a) Raw Materials [69,000 × 25 × 1/12] | 1,43,750 | |
| | (b) Direct wages [69,000 × 5 × 1/12] | 28,750 | |
| | (c) Overheads [69,000 × 10 × 1/12] | 57,500 | |
| | Manufacturer heads : 16% of SP 8 | | |
| | Selling overheads : 4% of sp : 2 = 10 (8 + 2) | | 2,30,000 |
| | (iii) Finished goods [69,000 × 40 × 3/12 | | |
| | TC = [25 + 5 + 10 = 40] | | 6,90,000 |
| | TC = [DM + DW + oh] | | |
| | (iv) Debtors [69,000 × 40 × 3/12] | | 6,90,000 |
| | Total current Assets (A) | | 18,97,500 |
| B) | Estimation of Current Liabilities | | |
| | (i) Creditors [69,000 × 50 × 2/12] | | 5,75,000 |
| | (ii) Wages [69,000 × 5 × 1/12] | | 28,750 |
| | Total current Liabilities (B) | | 6,03,756 |
| C) | Net working capital (A – B) | | 12,93,750 |
| | [18,97,500 – 6,03,750] | | |



**8. A Ltd. is into the retail business. You are advised to project its Working Capital requirement from the following data:**

**Annual Sales: ` 120 lakhs**

**Net Profit on Cost of Sales: 25%**

**Average Period allowed to Debtors: 6 weeks**

**Average Period allowed by Creditors: 3 weeks**

**Average stock carried: 8 weeks sales**

**Add 10% for contingencies.**

*Sol :* **(Aug.-17)**

**Calculation of Expected Working Capital Requirement**

**Statement of Working Capital Requirements**

| **Particulars** | **Amount (`)** |
|---|---|
| **Current Assets (A)** | |
| Debtors (6 weeks) (90,00,000 × $\frac{6}{32}$) | 10,38,462 |
| Stock (8 weeks) (90,00,000 × $\frac{8}{52}$) | 13,84,615 |
| **Total (A)** | **24,23,077** |

| | |
|---|---|
| **Current Liabilities (B)** | |
| Creditors (3 weeks) (90,00,000 × $\frac{3}{52}$) | 5,19,231 |
| **Total (B)** | **5,19,23** |
| Net Working Capital (A – B) | **19,03,846** |
| **Add:** 10% for contingencies (19,03,846 × $\frac{10}{100}$) | 1,90,385 |
| **Total Working Capital Required** | **20,94,231** |

**Working Notes**

Sales = ` 1,20,00,000

Profit = ` 1,20,00,000 × 25% = ` 30,00,000

Cost of sales = ` 1,20,00,000 – ` 30,00,000 = ` 90,00,000.

[**Note:** Cost of sales is assumed as purchases].

## 4.7 Financing of Working Capital through Bank Finance and Trade Credit

**Q10. State the various sources of working capital finance.**

*Ans :* **(July-18)**

The following are the two sources of working capital,

**1. Trade Credit**

The extended credit which a customer receives from suppliers of goods in the normal functioning of a business is called as "trade credit". In trade credit, firms which make purchases are not required to make immediate cash payments, instead they can pay cash after a specific period of time. This deferred payment acts as a financial source during the credit purchases.

The following are the key features of trade credit,

(i) Trade credit is an informal arrangement between the buyer and seller for-the purchase of goods. It does not involve any legal instrument/acknowledgments of debt that has been granted on an open basis of account. The supplier transfers the goods to the buyer on credit and the buyer accepts the goods and agrees to pay the due amount in accordance with the sales terms as specified in the invoice. Such type of credit will be recorded as sundry creditors/ account payable in the purchase books of the buyer.

(ii) Trade credit also acts as bills payable: If a buyer signs a negotiable instrument bill for receiving trade credit, then it is recorded as bills payable in the buyer's balance sheet. A bill has a particular future date which is mostly used when the supplier is not sure about the willingness and ability of the buyer to pay.

**2. Bank Credit (or) Finance**

In India, bank credit is found to be one of the most important institutional sources of working capital finance, because it is specifically used to finance the current assets of an organization.

Banks are the key sources of working capital finance. Banks provide different sources of finance to the firms in order to meet their requirements, A firm can raise funds from bank in the following forms,

**(i) Loan**

Usually, commercial banks provide short-term loans, not more than one year, to meet the requirements of working capital. Loan is the amount paid by the bank to its customers against their security. After taking loan from the bank, borrower needs to pay some specific amount of interest on loan amount. A loan may be repayable in full amount at a time or on instalment basis.

**(ii) Cash Credits**

Cash credit is the most popular method of bank finance for working capital. Cash credit means a borrower is allowed to withdraw funds from the bank upto a specific limit against some securities. The borrower need not withdraw the entire fund at once. He can withdraw it as per his requirements. The borrower can deposit any excess amount with him. He is allowed to pay interest on the daily balance and not on entire amount of the account.

**(iii) Overdrafts**

Overdraft is an agreement between bank and current account holder. In this, a borrower is allowed to withdraw more amount than his credit balance upto a specific limit. Operations of the overdraft are free with no restrictions. The borrower is required to pay interest on daily overdrawn balances.

**(iv) Purchasing and Discounting of Bills**

Purchasing and discounting of bills are one of the most important form of short term finance, in which borrower can get funds from banks without any collateral security. Bill of exchange is drawn by the seller on buyer of goods on credit. Bank purchase this bill and discount it on demand and credit the account of customer with bill amount less discount. Bank presents the bill to acceptor on date of maturity, but if it is dishonoured then customer must pay the bill amount and expenses incurred by the bank.

**(v) Letter of Credit**

Letter of credit is introduced by the bank to meet the obligations of its customers upto a certain amount, when he fails to pay. Letter of credit is a guarantee given by banker to the suppliers on behalf of customer to honour a specified amount of bill.

**Q11. Explain the significance of financing working capital through trade credit and what do suppliers look for in granting trade credit.**

*Ans :* **(March-15, Sep.-15)**

**Significance of Financing Working Capital Through Trade Credit**

Trade credit is a source of finance which is usually available for the firm. It enables the firm to make purchases and pay cash after a specific period of time. Trade credit expands with the increase in volume of purchases of the firm. The significance of financing working capital through trade credit are as follows,

1. Trade credit occurs with mutual understanding of both buyer and seller and it does not require any formal acknowledgment.
2. Trade credit can be obtained easily as there is no need of negotiations.
3. Mostly, it is useful for small firms which are unable to raise funds from capital market.
4. Trade credit are flexible in nature. It increases with the increase in sales of the firm and reduces with the decline in sales.
5. It is an informal and immediate source of finance. It does not have any restrictions which are involved in negotiated sources of finance.

**Points Considered Before Granting Trade Credits**

The following are the aspects that suppliers usually consider for granting trade credit,

**1. Liquidity Position of the Firm**

Suppliers normally look at the capability of the firm (i.e., liquidity position) in order to meet all the obligations within a short period of time.

**2. Record of Payment**

The firm is considered to be creditworthy only when it has regular and immediate system of paying the bulk of the suppliers.

**3. Earnings Record over a Period of Time**

The firm is considered to be favourable, if it has enough good earnings record along with this good portion of ploughing back of profits in the business.

## 4.8 Regulation of Bank Finance

**Q12. Explain briefly about Regulation of Bank Finance.**

*Ans :*

For lending working capital finance to companies, banks used to follow some norms or rules and regulations. These norms were influenced by the recommendations of different committees appointed by Reserve Bank of India (RBI). Some of the committees appointed by RBI are, Daheja Committee, Tandon Committee, Chore Committee etc. The norms of working capital finance are mainly based on the recommendations of the 'Tandon Committee'.

**Dehejia Committee Report**

The Dehejia committee was appointed in 1968 to determine the existing system of bank lending on the basis of cash credit system. The committee was of the opinion that major portion of bank lending was long-term.

As per Daheja committee, the main drawbacks in the existing system of working finance to industry are,

1. Borrower decide the amount he/she going to borrow but banker fails to do so.
2. Bank credit is considered as initial source of finance rather than supplementary to other alternative sources of finance
3. The credit is lent on the basis of amount of security rather than extent of operations of borrower.
4. Security does not give guarantee of safety of bank finance because usually all bad loans are secured loans.

**Tandon Committee Report**

The committee of Shri. P.L.Tandon was set up in July 1974 by the Reserve Bank of India. The references of the committee were :

**1. Operating Plan**

It is the responsibility of borrower to decide his/her credit requirement. To do so, he/she need to make an operatic, plan and submit it to the banker. This operating plan helps the banker to carryout credit planning.

**2. Production-based Financing**

Banker must provide credit only to meet the genuine production requirements of the borrower. The borrower mur maintain adequate amount of inventory and receivables to avoid shortage of inventories.

**3. Partial Bank Financing**

It is not possible for the banker to meet complete working capital requirements of the borrower. Only parties requirements can be met by the bank. The borrower has to meet remaining financial requirement from his/her own funds

### Chore Committee Report

The Reserve Bank of India (RBI) had appointed Chore Committee on April 1979 to evaluate the system of cash credit. Mr. K.B. Chore is a Chairman of this committee.

**Q13. What are the various recommendations suggested by Tandon, Daheja and Chore Committee on working capital ? What are the objectives behind appointing first two committees ?**

*Ans :* **(Aug.-17, Feb.-17)**

### Recommendations of Tandon Committee

The recommendations of the tandon committee are as follows,

1. It provides guidelines to commercial banks to regulate and control the credit and thereby to ensure that funds are used properly.
2. It suggests that borrowers must provide operating plans and other related information periodically to the banks and these banks must provide it to the Reserve Bank of India.
3. It also gave suggestions relating to inventory. The amount of holding inventory in private and public sectors is also explained by this committee.
4. It provides suggestions relating to sources of finance for minimum working capital requirements.
5. If present pattern of financing working capital is not good, then it provides modifications which are appropriate.

### Recommendations of Daheja Committee

The following are the recommendations of Daheja Committee which were accepted by RBI. They are as follows,

1. Banks' must be held responsible to evaluate the credit applications depending on overall financial position of the customer.
2. Banks must decide the cash credit limit based on two categories i.e.,
   (a) Hard core is the minimum level of raw material, finished goods and stores that should be maintained by industry to have a specific level of production.
   (b) Fluctuating part implies short-term increase in inventories, tax, dividends and bonus payments!
3. Chambers of Industry or the India Bank Association must decide the level of inventory in order to ascertain the hard core element of cash credit accounts.

### Recommendations of Chore Committee

The important recommendations of the Chore Committee are as follows,

**1. Reduced Dependence on Bank Credit**

To finance working capital requirements and reduce dependency on bank credit, the borrower should contribute more funds. If the borrower is unable to meet his immediate requirements, he would be granted excess borrowing in the form of Working Capital Term Loan (WCTL). This loan should be repaid in five years in semi-annual installments.

**2. 'Peak Level' and 'Normal Peak Level'**

The bank should fix separate credit limits for 'peak level' and non peak level credit requirements of borrowers. Within the sanctioned limits for these two periods, the borrower should indicate in advance his need for funds during a quarter. Temporary credit limits should be discouraged by banks but if sanctioned under exceptional circumstances, then additional interest of 1 percent per annum should be charged for such limits.

**3. Existing Lending System to Continue**

The three existing lending systems are: Cash credit, loans and bills. Wherever possible, cash credit system should be replaced by loans and bills. Bank should take steps to convert cash credit limits into bill limits for financing sales.

**Objectives of Tandon Committee**

The main objectives of Tandon Committee are to,

1. Provide instructions to commercial banks for controlling credit and ensuring that funds are used effectively.
2. Specify inventory norms for various industries.
3. Give suggestion regarding replacing existing financing methods with overdraft and cash credit.
4. Suggest techniques for acquiring information related to production plans and credit requirements of borrower.
5. Propose criteria for adequate capital structure and sound financial basis with respect to borrowings.

**Objectives of Daheja Committee**

The main objective of Daheja Committee is to evaluate the level at which the credit requirements of industry and trade rise up.

# Exercise Problems

1. From the following details you are required to make an assessment of the average amount of working capital requirement of ABC Ltd.

| Particulars | Average Period of Credit | Estimate for the 1st Year (`) |
|---|---|---|
| Purchase of material | 6 weeks | 26,00,000 |
| Wages | $1\frac{1}{2}$ weeks | 19,50,000 |
| Overheads | | |
| Rent, rates, etc. | 6 months | 1.00,000 |
| Salaries | 1 month | 8,00,000 |
| Other overheads | 2 months | 7,50,000 |
| Sales cash | 2,00,000 | |
| Credit sales | 2 months | 60,00,000 |
| Average amount of stocks and work-in-progress | | 4,00,000 |
| Average amount of undrawn profit | | 3,00,000 |

It is to be assumed that all expenses and income were made at even rate for the year.

**[Ans: Net Working Capital Required = ` 5,02,083]**

2. From the following projections of XYZ and Co. for the next year, you are required to determine the working capital required by the company:

| | |
|---|---|
| Annual Sales | ` 14,40,000 |
| Cost of Production (Including depreciation of ` 1,20,000) | ` 12,00,000 |
| Raw Material Purchases | ` 7,05,000 |
| Monthly Expenditure | ` 25,000 |
| Estimated Opening Stock of Raw Materials | ` 1,40,000 |
| Estimated Closing Stock of Raw Materials | ` 1,25,000 |
| Inventory Norms: | |
| Raw Materials | 2 months |
| Work-in-Process | ½ month |
| Finished Goods . | 1 month |

The firm enjoys a credit of half a month on its purchases and allows one month credit on its supplies. On sales orders the company receives an advance of ` 15,000.

You may assume that production is carried-out evenly throughout the year and minimum cash balance desired to be maintained is ` 10,000.

**[Ans: Net Working Capital = ` 3,35,625]**

# Short Question and Answers

**1. Working Capital**

*Ans :*

Working Capital refers to the cash a business requires for day-to-day operations, (or) more specifically, for financing the conversion of raw materials into finished goods, which the company sells for payment. Among the most important items of working capital are levels of inventory, debtors and creditors. These items are looked at for signs of a company's efficiency and financial strength.

**Definition of Working Capital**

**(i) According to Shubin,** "Working capital the amount of funds necessary to cover the cost of operating the enterprise".

**(ii) According to Gerstenberg,** "Circulating capital means current assets of a company that are changed in the ordinary course of business from one form to another, as **for example,** from cash to inventories, inventories to receivables, receivables into cash".

**(iii) According to Hoagland,** "Working capital is descriptive of that capital which is not fixed. But, the more common use of working capital is to consider it as the difference between the book value of the current assets and the current liabilities".

**2. Components of Working Capital.**

*Ans :*

Efficient management of working capital involves effective control over the current assets and current liabilities which are the main components of working capital.

**(i) Components of Current Assets**

Current assets are those assets that, in the ordinary course of business, can be turned into cash within an accounting period (not exceeding over one) without undergoing diminution in value and without disrupting the operations. Current assets consists of cash, marketable securities, inventories, sundry debtors, one- year fixed deposits with banks, prepaid expenses.

**(ii) Components of Current Liabilities**

Current liabilities are those liabilities intended to be paid in the ordinary course of business within a reasonable period (normally within a year) out of the current assets or revenue of the business. The current liabilities consist of sundry creditors, loans and advances, bank over-draft, short-term borrowings, taxes and proposed dividend.

**3. Differences between Gross Vs Net Working Capital.**

*Ans :*

| S.No. | Gross working capital (GWC) | Net Working Capital (NWC) |
|---|---|---|
| 1. | Gross Working Capital (GWC) refers to that amount of investment which has been invested by the firm in financing its current assets. | Net Working Capital (NWC) refers to the net amount which could be obtained by deducting the current liabilities from the current assets.<br>i.e., $\boxed{\text{NWC} = \text{Current assets} - \text{Current liabilities}}$ |

| | | |
|---|---|---|
| 2. | As it mainly deals with current assets, they can be easily converted into cash within an accounting year (which is usually less than an year). Example : Cash, debtors, bills receivable, stock etc. | As it represents a differential amount, which is actually the amount of investment made in current assets that have been financed by the long-term sources. |
| 3. | Through, gross working capital the liquidity position of the firm can be determined. Because of this liability, it is found to be of managerial interest. | Net working capital is highly significant as it enables the firm to meet its future needs. |
| 4. | If high amount is vested in the maintenance of gross working capital, then the firm is exposed to high risk of obsolescence. | If high amount is vested in the maintenance of net working capital, liquidity position of a firm can be considerably improved. |

### 4. Advantages of Working Capital

*Ans :*

The main advantages of maintaining adequate amount of working capital are as follows:

**(i) Cash Discount**

If a proper cash balance is maintained, the business can avail the advantage of cash discount by paying cash for the purchase of raw materials and merchandise. It will result in reducing the cost of production.

**(ii) Creates a Feeling of Security and Confidence**

The proprietor or officials or management of a concern are quite carefree, if they have proper working capital arrangements because they need not worry for the payment of business expenditure or creditors. Adequate working capital creates a sense of security, confidence and loyalty, not only throughout the business itself, but also among its customers, creditors and business associates.

**(iii) 'Must' for Maintaining Solvency and Continuing Production**

In order to maintain the solvency of the business, it is but essential that the sufficient amount of fund is available to make all the payments in time as and when they are due. Without ample working capital, production will suffer, particularly in the era of cut throat competition, and a business can never flourish in the absence of adequate working capital.

**(iv) Sound Goodwill and Debt Capacity**

It is common experience of all prudent businessmen that promptness of payment in business creates goodwill and increases the debt of the capacity of the business. A firm can raise funds from the market, purchase goods on credit and borrow short-term funds from bank, etc. If the investor and borrowers are confident that they will get their due interest and payment of principal in time.

### 5. Disadvantages of Working Capital

*Ans :*

The disadvantages suffered by a company with excessive working capital are as follows :

**(i) Heavy Investment in Fixed Assets**

A concern may invest heavily in their fixed asset which is not justified by actual sales. This may create situation of over capitalisation.

**(ii) Reckless Purchase of Materials**

Inventory is purchased recklessly which results in dormant slow moving and obsolete inventory. At the same time it may increase the cost due to mishandling, waste, theft, etc.

**(iii) Speculative Tendencies**

Speculative tendencies may increase and if profit is increased dividend distribution will also increase. This will hamper the image of a concern in future when speculative loss may start.

**(iv) Liberal Credit**

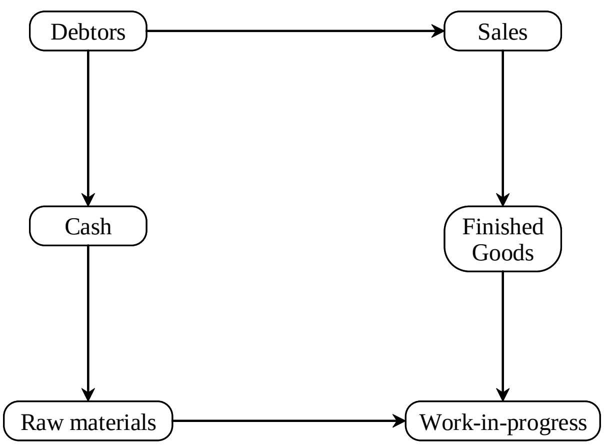
Due to liberal credit, size of accounts receivables will also increase. Liberal credit facility can increase bad debts and wrong practices will start, regarding delay in payments.

## 6. Operating Cycle

*Ans :*

The operating cycle implies the stages or processes through which the raw materials are processed to get the final product. If the process is lengthy and takes long time to get the finished products, the requirements of working capital will be much larger than that of a unit which has a relatively low operating cycle. The shortest manufacturing process will minimise the investment in the form of work-in-progress.

**Operating cycle of a manufacturing firm**




Requirements of working capital of a firm can be estimated by multiplying the duration of the operating cycle by cost of operations. The time period for completion of operating cycle is evaluated by, O = R + W + F + AP

Where,

O - Time period of operating cycle

R - Duration of raw material

W - Duration of work in progress

F - Duration of finished goods inventory

A - Duration of accounts receivable

P - Duration of accounts payable.

## 7. Estimation of Working Capital.

*Ans :*

Working capital is an essential element of every business. It is necessary for a financial manager to estimate an adequate amount of working capital which is to be maintained in the business. Working capital requirements can be estimated with the help of following methods.

**(i) Percentage of Sales Method**

The percentage of sales method is used to estimate the level of working capital requirement by considering past record. A relationship between sales and working capital is calculated for determining the quantum of working capital . This method is simple and easily understood but it is not appropriate in all situations. It is used for identifying short term changes in working capital in future.

**(ii) Regression Analysis Methods**

The regression analysis method is one of the statistical method used for estimating working capital requirements. In this method the average relationship between sales and working capital and its various components is identified with the help of least squares method and this relationship is expressed in following equation,

y = a + bx

Where,

a – Fixed component

b – Variable component

x – Sales

y – Inventory

n – Number of observation.

In order to find the values of a and b, firm needs to find the solution for the equation.

$y = na + bx$

### 8. Trade Credit

*Ans :*

The extended credit which a customer receives from suppliers of goods in the normal functioning of a business is called as "trade credit". In trade credit, firms which make purchases are not required to make immediate cash payments, instead they can pay cash after a specific period of time. This deferred payment acts as a financial source during the credit purchases.

The following are the key features of trade credit,

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*Ans :*

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**(iii) Partial Bank Financing**

It is not possible for the banker to meet complete working capital requirements of the borrower. Only parties requirements can be met by the bank. The borrower has to meet remaining financial requirement from his/her own funds.

# UNIT V

**Management of Current Assets :** Management of cash – Basic strategies for cash management, cash planning, cash budget, cash management techniques/ processes. Marketable securities: characteristics, selection criterion, Management of receivables- Credit policy, credit evaluation of individual accounts, monitoring receivables, factoring.

**Management of inventory :** Inventory management process, Inventory control systems, analysis of investment in inventory.

**Corporate Restructuring :** Corporate Mergers, Acquisitions and Takeovers: Types of Mergers, Economic rationale of Mergers, motives for Mergers, Financial evaluation of Mergers.

## 5.1 Management of Cash

**Q1. Define cash management.**

*Ans :*

Cash is one of the current assets of a business. It is needed at all times to keep the business going. A business concern should always keep sufficient cash for meeting its obligations. Any shortage of cash will hamper the operations of a concern and any excess of it will be unproductive. Cash is the most unproductive of all the assets. While fixed assets like machinery, plant, etc. and current assets such as inventory will help the business in increasing its earning capacity, cash in hand will not add anything to the concern. It is in this context that cash management has assumed much importance.

Cash is the important current asset for the operations of the business. Cash is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realised by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.

Cash is the money which a firm can disburse immediately without any restriction. The term cash includes coins, currency and cheques held by the firm, and balances in its bank accounts. Sometimes near-cash items, such as marketable securities or bank times deposits, are also included in cash. The basic characteristic of near-cash assets is that they can readily be converted into cash. Generally, when a firm has excess cash, it invests it in marketable securities. This kind of investment contributes some profit to the family.

**Meaning of Cash**

The term cash which refer to cash management is the ready currency to which all liquid assets can be reduced.

These are basically used in two sense.

1. Narrow sense and
2. Broader sense

**1. Narrow Sense**

The Narrow sense is used broadly to cover currency and generally accept equivalents of cash such as coins, currency notes cheques, bank drafts and demand deposit in bank.

**2. Broader Sense**

The Broader sense also include "Near Cash Assets" such as marketable securities and time deposits with banks. The main character is the securities or deposits can immediately be sold or converted into cash. These are also include the short term investment out lets for excess cash. Thus the term "Cash Management' is generally used for management of both cash and near cash assets.

**Q2. Explain the objective of cash management.**

*Ans :* **(Dec.-18)**

**Objectives of Cash Management**

The basic objectives of cash management are two-fold :

1. **Meeting the Payment Schedule:** In the normal course of business firms have to make payments of cash on a continuous and regular basis to suppliers of goods, employees and so on. At the same time, there is a constant inflow of cash through collections from debtors. A basic objective of cash management is to meet the payment schedule, i.e., to have sufficient cash to meet the cash disbursement needs of a firm. The importance of sufficient cash to meet the payment schedule can hardly be over-emphasized. The advantages of adequate cash are:

   i) It prevents insolvency or bankruptcy arising out of the inability of a firm to meet its obligations

   ii) The relationship with the bank is not strained;

   iii) It helps in fostering good relations with trade creditors and suppliers of raw materials, as prompt payment may help their own cash management;

   iv) A trade discount can be availed of if payment is made within the due date;

   v) It leads to a strong credit rating which enables the firm to purchase goods on favourable terms and to maintain its line of credit with banks and other resources of credit;

   vi) To take advantage of favourable business opportunities that may be available periodically;

   vii) Finally, the firm can meet unanticipated cash expenditure with a minimum of strain during emergencies, such as strikes, fires or a new marketing campaign by competitors. Keeping large cash balances, however, implies a high cost; the advantages of prompt payment of cash can well be realized by sufficient and not excessive cash.

2. **Minimizing Funds Committed to Cash Balances:** The second objective of cash management is to minimize cash balances. In minimizing the cash balances two conflicting aspects have to be reconciled. A high level of cash balances will, as shown above, ensure prompt payment together with all the advantages. But it also implies that large funds will remain idle, as cash is a non-earning asset and the firm will have to forego profits. A low level of cash balances, on the other hand, may mean failure to meet the payment schedule. The aim of cash management should be to have an optimal amount of cash balances.

**Q3. What are the factors determining cash need ?**

*Ans :*

The amount of cash for transaction requirements is predictable and depends upon a variety of factors which are follows:

1. **Credit Position of the Firm**

   The credit position influences the amount of cash required in two distinct ways:

   (i) If a firm's credit position is sound, it is not necessary to carry a large cash reserve for emergencies.

   (ii) If a firm finances its inventory requirements with trade credit, its cash requirements are considerably smaller, since the firm can synchronize the credit terms it gives to its customers with the terms it receives.

2. **Status of Firm's Receivable**

   The amount of time required for a firm to convert its receivable into cash also affects the amount of cash needed and of course, reduces total working capital employed. In other words, the longer the credit terms, the slower the turn over. When flow out is not synchronized with turn over, a firm must carry amounts of cash relatively larger than would otherwise be required.

**3. Status of Firm's Inventory Account**

The status of a firm's inventory account also affects the amount of cash tied up at any one time.

**For example,** if one business firm carries two months inventory on hand and another firm carries only one month's supply, the former has twice as much investment in inventory and will normally be called upon to maintain a larger investment in cash in order to finance its acquisition.

**4. Nature of Business Enterprise**

The nature of a firm's demand definitely affects the volume of cash required.

**For example,** a firm whose demand is volatile needs a relatively larger cash reserve than one whose demand is stable. Public utility firms exhibit stable demand where as firms that deal with high fashion merchandize or goods that tend to be 'faddish' are subject to high degrees of volatility.

**5. Management's Attitude Towards Risk**

A more conservative management will hold a larger cash reserve than one that is less conservative. The former usually demands more liquidity than the latter and consequently does not experience the same degree of efficiency. A generalization is made that the firm that effectively plans its working capital policies is less conservative than one that does little or no planning. The obvious conclusion is that planning allows the firm to predict its requirements more accurately, there by eliminating uncertainty, which is the basis for large cash reserves.

**6. Amount of Sales in Relation to Assets**

Another characteristic affecting the level of cash is the amount of sales in relation to assets. Firms with large sales relative to fixed assets are required to carry larger cash reserves. This is the result of having larger sums invested in inventories (particularly finished goods) and receivables. It should be remembered, however, that cash requirements do not increase in the same proportion as sales. The rule is that as sales increase, cash also increases but at a decreasing rate, it is impossible to determine to what extent each characteristic affects the total volume of cash, but these examples indicate that different types of businesses have different cash requirements.

**7. Cash Inflows and Cash Outflows**

Every firm has to maintain cash balance because its expected inflows and outflows are not always synchronized. The timings of the cash inflows may not always match with the timing of the outflows. Therefore, a cash balance is required to fill up the gap arising out of difference in timings and quantum of inflows and outflows.

**8. Cost of Cash Balance**

Another factor to be considered while determining the minimum cash balance is the cost of maintaining excess cash or of meeting shortages of cash. There is always an opportunity cost of maintaining excessive cash balance. If a firm is maintaining excess cash then it is missing the opportunities of investing these funds in a profitable way.

### 5.1.1 Basic strategies for cash management

**Q4. State the various strategies of cash management.**

*Ans :*

Before formulating the basic strategies for cash management, net cash position of a firm needs to be estimated through the cash budget. Once the position is estimated, strategies have to be formulated which is based on the process of cash turnover. Cash turnover is a combination of the cash cycle and the cash turnover. Let us first understand the key terms of the process.

Cash cycle refers to the time period required between the payment of cash (for the purchase of production inputs) and receipt of payment (by the sale of finished goods to the customers). Cash cycle occurs continuously. Whereas, the cash turnover refers to the frequency with which the cash is utilized in the business. Cash turnover is usually determined for one year, average age of inventory and average collection period and then deducting the average accounts payable period from the resultant.

i) Cash turnover

$$= \frac{\text{Number of days in a year}}{\text{Cash cycle}}$$

ii) Cash cycle = Average age of inventory and average collection period - Average accounts payable period.

Cash management strategies must minimize the requirements of operating cash balance. The level of opening cash balance at which the firm would be able to fulfill all its obligations is called as minimum operating cash level. It is calculated by dividing total annual outlays by the cash turnover i.e.,

Minimum operating cash balance

$$= \frac{\text{Total annual outlays}}{\text{Cash turnover}}$$

The main purpose of cash management strategies is to minimise the operating cash balance require. These are to be done through,

1. Stretching A/c payable.
2. Efficient Inventory production management.
3. Speedy collection of A/c receivable.
4. Combined cash management strategies.

**1. Stretching A/c Payable**

One of the strategy of cash management is to stretch the accounts payable. The firm can paid the account payable as late as possible with damaging its credit standing. How ever it should take advantage of the cash discount available of prompt payment.

**2. Efficient Inventory Production Management**

This strategy is to increase the inventor turnover, avoiding storage of stock. This can be done by,

i) **Increase the Raw Material Turnover :** The raw material turnover can increase by using efficient inventory control techniques.

ii) **Increase the Finished Good Turnover :** This can be done through better forecasting of demand and production planning.

iii) **Decrease the Production Cycle :** This is done through better production planning, scheduling and control techniques. This is lead to increase the work in progress.

**3. Speedy Collection of A/c Receivable**

The next strategy of cash management is to collect A/c receivable as early as possible without loosing future sales. The average collection period of receivable can be reduced by changes in,

i) Credit terms.

ii) Credit standards.

iii) Collection policies.

**4. Combined Cash Management Strategies**

The efficient cash management strategy effects the operating cash requirements. The three related basic strategy are,

i) **A/c Payable :** If the payment of Account payable postponed too long, it effects the firm credit standing.

ii) **Inventory :** Due to less available of inventory, lead to stoppage of production. The firm may short of enough stock to meet the demand for production i.e., stock out.

iii) **Account Receivables :** The sales should be damaged due to restrictive credit standards, credit terms and collection policies.

### 5.1.2 Cash Planning

**Q5. Define cash planning.**

*Ans :*

Cash planning and control of cash are the central point of finance functions. Maintenance of adequate cash is one of the prime responsibilities of the finance manager. Cash budget helps maintain adequate cash always.

Cash control also includes cash planning. Since planning and control are the twins of management. Cash planning is a technique to plan and control the use of cash. A projected cash flow statement is prepared based on expected cash receipts and payments, anticipation of the financial condition of the firm. Cash planning may be prepared on daily, weekly, monthly or quarterly basis. The period for which the cash planning is prepared depends on the size of the firm and managements' philosophy. Large firms, prepare daily and weekly forecasts. Medium-sized firms prepare weekly and monthly forecasts. Small firms may not prepare cash forecasts due to non-availability of data and less scale of operations. But in a short period they may survive but over a long period they have to prepare cash planning for success of the firm.

### 5.1.3 Cash Budget

**Q6. Define cash budget. Explain the objective of cash budget.**

**(OR)**

**Why do we prepare cash budget ?**

*Ans :* **(Nov.-20, July-18, Aug.-17, Feb.-17)**

Cash budget is nothing but the written form of various forecasts relating to cash receipt and cash payments. In other words, to meet future obligations, forecasting the expected receipts and expected payments of cash is known as cash budget i.e., cash budget is a mere forecast of cash position of an undertaking for a definite period. In cash budget the budget period is normally daily, weekly, monthly or quarterly etc. There are two distinct parts of cash budgeting one is forecast the cash receipts and second forecast the cash disbursement/payments.

**According to the Guthmen and Dougal**, "Cash budget is an estimate of cash receipts and disbursements for a future period of time".

**Characteristics of Cash Budget**

1. Cash budget is a statement of anticipated cash receipts and payments.
2. Cash budget is related to predetermined future period.
3. Cash budget is expressed in terms of monetary values.
4. Cash budget is forecast of financial aspirations of the enterprise.
5. Cash budget is an outline of future plans, policies and actions of the management.

**Objectives of Cash Budget**

The main objectives of preparing cash budget are as under,

1. The probable cash position as a result of planned operations is indicated and thus the excess or shortages of cash is known. This helps in arranging short term borrowings in advance to meet the situation of shortage of cash or making investments in times of excess of cash.
2. Cash can be coordinated in relation to total working capital, sales, investment and debt.
3. A sound basis for credit and for current control of cash positioned is established.

**Q7. Explain the advantages of cash budget.**

*Ans :*

**Advantages of Cash Budget**

Cash budget is very useful tool for financial planning which is also helps in arranging new loans, borrowing replacing the existing debts cash outlays etc. Cash budget also helpful for those concern having adequate owned funds and to get maximum profit by considering the alternative uses and available resources. The following are the additional advantages of cash budgeting. They are,

1. Estimated cash position can be easily ascertained by using the planned operating system through cash budget.
2. Effective control on cash position can be done using the cash budget.
3. In a business, the cash budget also shows the fact whether the concern may be facing a situation of excess or shortage of cash.
4. Cash budget provides a sound basis for resorting to borrowing in terms of quantum and time.
5. The coordination between cash and working capital sales, investment or loan can be done by using this cash budgeting.
6. Whether the concern in a position to need borrowing or not is also known by the cash budget.

**Q8. Explain the various methods to preparation of cash budget.**

*Ans :* **(Feb.-17)**

**Preparation of Cash Budget**

The cash budget can be prepared by any of the following methods,

1. Receipts and payments method.
2. The adjusted profit and loss method.
3. The balance sheet method.

**1. Receipts and Payments Method**

In case of this method the cash receipts from various sources and the cash payments to various agencies are estimated. In the opening balance of cash, estimated cash receipts are added from the total, the total of estimated cash payments are deducted to find out the closing balance. If monthly/quarterly cash budgets are to be prepared, first of all the closing balance of first month/quarter will be computed which will be the opening balance for the next month/quarter.

Similarly the closing balance for 2 nd month/ quarter can be known and so on. The estimated receipts may be from cash sales, credit collections, interest, dividend, miscellaneous receipts, issue of share capital, loans etc. Estimated disbursements may be regarding materials, labour, overheads, granting loan or repayment of loan, payment of advance tax, purchase of assets etc.

**2. Adjusted Profit and Loss Method**

In case of this method the cash budget is prepared on the basis of opening cash and bank balances, projected profit and loss account and the balances of the various assets and liabilities.

Cash from operations is not that figure of profit which is shown by the profit and loss account, but is the figure of profit as adjusted in the light on non-cash items such as depreciation, loss on sale of capital assets, preliminary expenses written off from P&L A/c etc.

Since these items do not affect cash position though they have been charged to the profit and loss account, they are added back to the profit or deducted from loss, as the case may be. Issue of new shares, realisation from sale of fixed assets or raising long term loans are taken as other sources of cash. Similarly, redemption of preference shares (in case of redeemable preference shares), payment of long term loans, purchase of fixed assets, payment of dividends etc., are taken as application of cash.

**3. Balance Sheet Method**

With the help of budgeted balances at the end except cash and bank balances, a budgeted balance sheet can be prepared and the balancing figure would be the estimated closing cash/bank balance. Thus, under this method, closing balances other than cash/ bank will have to be found out first to be put in the budgeted balance sheet. This can be done by adjusting the anticipated transactions of the year in the opening balances.

**Q9. Draw the specimen of cash budget.**

*Ans :* **(July-18)**

**Proforma of Cash Budget**

| Particulars | X Month | Y Month | Z Month |
|---|---|---|---|
| 1) Opening Cash Balance | | | |
| 2) Estimated Cash Receipts | | | |
| i) Cash Sales | | | |
| ii) Cash Collection from Debtors | | | |
| iii) Interest Received from Investments | | | |
| iv) Cash inflow on Issue of New Securities | | | |
| v) Raising of Loans | | | |
| vi) Sale of Assets | | | |
| vii) Dividend | | | |
| 3) Total Receipts available during the month (1 + 2) | | | |
| 4) Estimated Cash Payments | | | |
| i) Payment for Cash Purchases | | | |
| ii) Payment to Sundry Creditors for Creditors Purchases | | | |
| iii) Payment for Wages and Salaries | | | |
| iv) Payment for other Administrative Expenses | | | |
| v) Payment in the nature of Capital Expenditure | | | |
| vi) Loan Repayment | | | |
| vii) Dividend Payment | | | |
| viii) Payment of Interest on Loan | | | |
| **Total Cash Payments** | | | |
| 5) Closing Cash Balance (3 - 4) | | | |

**Table : Format of cash budget**

## PROBLEMS ON CASH BUDGET

**1. XYZ Ltd manufacturers razor blades. Its estimated monthly sales for the period Jan 1, 2002 to June 30, 2002 are as follows :**

**Jan – March Rs. 1,00,000**

**April – June Rs. 1,20,000**

**The sales during November and December 2001 were Rs. 1,00,000 each month 20% of sales are for cash and the rest are credit sales. Past records show that receivables from credit sales are collected as following :**

**50% one month from the date of sale and the balance, 2 months from the date of sales.**

**No bad debts are expected to occur.**

**Other anticipated receipts are :**

**(i) Rs. 8,000 from the sale of Machine in March and (ii) Rs. 20,000 interest on investments in March and June. The company plans to purchase materials worth Rs. 50,000 per**

**month from Jan - March and Rs. 60,000 per month from April - June. During December 2001, Rs. 50,000 worth of materials were purchased. Purchases are usually paid in the following month. Miscellaneous cash purchases are forecasted at Rs. 2,000 per month. Wages payable are Rs. 25,000 per month; manufacturing expenses Rs. 12,000 per month; General administration expenses are estimated at Rs. 10,000 per month. Tax payment of Rs. 25,000 is scheduled in April 2002. The company proposes to buy Machinery worth Rs. 40,000 in June 2002. The cash balance on 1st Jan, 2002 was Rs. 25,000 and the firm desires to maintain minimum cash balance of Rs. 25,000 During December 2001 . Rs. 50,000 worth of material were purchased. Purchases are usually paid in the following month.**

**With the above information, prepare a cash budget.**

*Sol :*

**A. Forecast of cash receipts**

| S.No. | Particulars | Jan (Rs.) | Feb (Rs.) | March (Rs.) | April (Rs.) | May (Rs.) | June (Rs.) |
|---|---|---|---|---|---|---|---|
| 1. | Sales | 1,00,000 | 1,00,000 | 1,00,000 | 1,20,000 | 1,20,000 | 1,20,000 |
| 2. | Credit sales (80%) | 80,000 | 80,000 | 80,000 | 96,000 | 96,000 | 96,000 |
| 3. | Collection of receivables | 40,000 | 40,000 | 40,000 | 48,000 | 48,000 | 48,000 |
| | 50% in following month | | | | | | |
| | 50% 2 months after sale | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 48.000 |
| 4. | Cash sales | 20,000 | 20,000 | 20,000 | 24,000 | 24,000 | 24,000 |
| 5. | Receipts from sale of Machinery | – | – | 8,000 | – | – | – |
| 6. | Interest on investments | – | – | 20,000 | – | – | 20,000 |
| | Total cash receipts (3 + 4 + 5 + 6) | 1,00,000 | 1,00,000 | 1,28,000 | 1,12,000 | 1,12,000 | 1,40,000 |

**B. Cash payments**

| Sl.No. | Particulars | Jan (Rs.) | Feb (Rs.) | March (Rs.) | April (Rs.) | May (Rs.) | June (Rs.) |
|---|---|---|---|---|---|---|---|
| 1. | Purchases | 50,000 | 50,000 | 50,000 | 60,000 | 60,000 | 60,000 |
| 2. | Misc. purchases | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| 3. | Wages | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| 4. | Manufacturing expenses | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| 5. | Administration expenses | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | – |
| 6. | Tax payments | – | – | – | 25,000 | – | – |
| 7. | Purchase of machinery | – | – | – | – | – | 40,000 |
| | **Total payments** | **99,000** | **99,000** | **99,000** | **1,34,000** | **1,09,000** | **1,39,000** |
| | C. Net receipts/ payments | 1,000 | 1,000 | 29,000 | (22,000) | 3,000 | (1,000) |
| | Balance at the beginning | 25,000 | 26,000 | 27,000 | 56,000 | 26,000 | 33,000 |
| | Balance at the end | 26,000 | 27,000 | 56,000 | 30,000 | 33,000 | 32,000 |

**2. Venkat Industries (New Company) have requested to prepare a cash budget for the period of 6 months from Jan to June 2004. They have provided the following information. (Rs. in lakhs)**

| Particulars | Jan | Feb. | March | April | May | June |
|---|---|---|---|---|---|---|
| Sales | 80.00 | 100.00 | 120.00 | 120.00 | 120.00 | 120.00 |
| Purchases | 2.00 | 3.00 | 4.00 | 4.00 | 4.00 | 2.00 |
| Wages | 12.00 | 14.00 | 16.00 | 16.00 | 16.00 | 12.00 |
| Manufacturing expenses | 26.00 | 27.00 | 28.00 | 28.00 | 28.00 | 26.00 |
| Administration expenses | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Distribution expenses | 4.00 | 6.00 | 8.00 | 8.00 | 8.00 | 4.00 |

**Additional financial cash flows:**

- **Receipt of interest Rs. 2 lakhs each in the months of Jan and May.**
- **Receipt of dividend Rs. 3 lakhs each in the months of March and June.**
- **Sale of securities in the month of June for Rs. 3 crore**
- **Payment of interest during January for Rs. 50,000**
- **Payment of loan in the month of June for Rs. 1,50,00,000**
- **Interim dividend payment of Rs. 10,00,000 in the month of April**
- **Installment of machine in the month of June for Rs. 42 lakhs.**

**You may assume: 10 per cent of each month's sales for cash; customers are allowed a credit period of one month; creditors are allowing a credit of two months; wages are paid on the Ist of the next month.**

*Sol :*

**Cash budget for 3 months from Jan to June 2004 (` in Lakhs)**

| Particulars | Jan | Feb | March | April | May | June |
|---|---|---|---|---|---|---|
| **A) Receipts :** | | | | | | |
| Cash sales (10% of sales) | 8.00 | 10.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| Collections from customer | 0.00 | 72.00 | 90.00 | 108.00 | 108.00 | 108.00 |
| Interest received | 2.00 | — | — | — | 2.00 | — |
| Dividend received | — | — | 3.00 | — | — | 3.00 |
| Sale of securities | — | — | — | — | — | 300.00 |
| **Total receipts** | 10.00 | 82.00 | 105.00 | 120.00 | 122.00 | 423.00 |
| **B) Payments:** | | | | | | |
| Purchases | 0.00 | 0.00 | 2.00 | 3.00 | 4.00 | 4.00 |
| Wages | 0.00 | 12.00 | 14.00 | 16.00 | 16.00 | 16.00 |
| Manufacturing expenses | 26.00 | 27.00 | 28.00 | 28.00 | 28.00 | 26.00 |
| Administration expenses | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Distribution expenses | 4.00 | 6.00 | 8.00 | 8.00 | 8.00 | 4.00 |
| Interest paid | 0.50 | — | — | — | — | — |
| Loan paid | 0.00 | — | — | — | —. | 150.00 |
| Interim dividend | — | — | — | 10.00 | — | — |
| Installment payment of machine | — | — | — | — | — | 42.00 |
| **Total payments** | 34.50 | 49.00 | 59.00 | 69.00 | 60.00 | 246.00 |
| Closing Balance (A)-(B) (Deficit) – Surplus | **(24.50)** | **33.00** | **46.00** | **51.00** | **62.00** | **177.00** |

**3. From the following particulars prepare a monthly cash budget for the quarter ended 31s' March 2004.**

**(` in lakhs)**

| Month | Sales | Purchases | Wages | Expenses |
|---|---|---|---|---|
| Nov '03 | 300 | L00 | Z00 | 040 |
| Dec -03 | 6.00 | 2.00 | 2.00 | 0.40 |
| Jan '04 | 4.00 | 3.00 | 2.20 | 0.50 |
| Feb '04 | 5.00 | 2.00 | 2.20 | 0.50 |
| March '04 | 6.00 | 1.00 | 2.40 | 0.50 |

**Additional information:**

- **10 per cent sales and purchases are on cash.**
- **Credit to debtors: one month on an average, 50% of debtor will make payment on the due date while the rest will make payment one month thereafter.**
- **Credit from creditors: 2 months.**
- **Wages to be paid twice in a month on the Is' and 16"' respectively.**
- **Expenses are generally paid within the month.**
- **Plant costing ` 1.00 lakh will be installed in February on payment of 25% of the cost in addition to the installation cost of ` 5,000, balance to be paid in three equal installments from the following month.**
- **Opening cash balance is 2,00,000.**

*Sol :*

**Cash Budget for three months from Jan to March 2003**

(` in lakhs)

| Particulars | Jan | Feb | March |
|---|---|---|---|
| **(A) Receipts:** | | | |
| Opening cash balance | 2.00 | 3.55 | 3.55 |
| Cash sales (10% of sales) | 0.40 | 0.50 | 0.10 |
| Collection during the 1st month (50% of the credit sales) | 2.70 | 1.80 | 2.25 |
| Collection during the 2nd month (50% of the credit sales) | 2.25 | 2.70 | 1.80 |
| **Total receipts** | **735** | **835** | **Z70** |
| **(B) Payments:** | | | |
| Payments to Creditors (10% cash) | 0.30 | 0.20 | 0.10 |
| Payment at end of credit period | 0.90 | 1.80 | 2.70 |
| Wages (50% last month's and 50% current month's) | 2.10 | 2.20 | 2.30 |
| Expenses | 0.50 | 0.50 | 030 |
| Plant (25% of the cost plus installation charge) | — | 0.30 | — |
| First installment | — | — | 0.25 |
| **Total payments** | **3.80** | **5.00** | **5.60** |
| **Closing Balance (A) - (B)** | **3.55** | **3.55** | **2.1** |

**4. A firm has been offered cost management service by a bank for Rs. 1,00,000 per year. It is estimated that such a service would not only eliminate 'excess' cash on deposits (Rs. 8,00,000) but also reduce its administration and other costs to the tune of Rs. 5,000 per month. Assuming the cost of capital of 15 percent, is it worthwhile for the firm to engage the cash management service ?**

*Sol :* **(Dec.-19)**

**Calculation of net Annual Benefits**

| | | |
|---|---|---|
| Savings in interest (` 8,00,000 × 0.15) | = | 1,20,000 |
| Reduction in administration and other cost (`5,000 × 12) | = | 60,000 |
| Total | | 1,80,000 |
| (–) cost annually bank service charges | | 1,00,000 |
| Net Annual Benefits | | 80,000 |

**Conclusion**

It is worth while to engage the Bank service.

### 5.1.4 Cash Management Techniques/Processes

**Q10. State the various techniques of cash management.**

**(or)**

**What are the various techniques employed in the management of cash.**

*Ans :* **(Nov.-20, May-19, March-15)**

There is a general tendency amongst divisional managers to keep cash balance in excess of their needs. The finance manager divide the system of an organisation to retain enough cash without having surplus balance on hand. Some of the cash management technique are used by the finance manager are,

1. Speedy cash collection.
2. Prompt payment by customers
3. Early conversion of payment into cash.
4. Concentration banking.
5. Lock box system.
6. Showing disbursement.

1. **Speedy Cash Collection :** The flow of cash Inflows process can be performed through planned and redefined strategy technique. This can be done by the two aspects,

   i) The customers should encourage to pay as early as possible.

   ii) The payment which is done by the customers should be converted into cash without any delay.

2. **Prompt Payment by Customers :** One of the method of prompt payment by customers is prompt billing. The prompt billing is the system where the customers already known about the pay and the payment date. The payment information can be provide by the self address enclosed this help to pay the amount with the return envelope also. Another important technique is to provide discount to the customers. This makes the encouragement of payment.

3. **Early Conversion of Payment into Cash:** As the customer makes the payment by a cheque, the collection can be expected by prompt enhancement of the cheque. Thus their is a time lag between the cheque preparation, mail and the funds collection. These can be done in three steps,

   i) **Postal Float :** It is the delay between the time when a payer mail a payment and the time when the payee receives it.

   ii) **Lethargy :** It is the time taken in between the processing the cheque i.e., received by a payee and the deposited in the banks.

   iii) **Bank Float :** It is the delay between the deposit of the cheque by the payee and the availability of the fund in short the time taken by the bank in collecting the payments from the customers bank.

   The postal float, lethargy and bank float are collectively known as "Deposit Float". The deposit float is the sum of cheques written by customers that are not yet usable by the firm i.e., fund dispatched by a payer and that are not in a position to use by the payee.

4. **Lock Box System :** Another means to accelerate the flow of funds is a lock box system. With concentration banking, remittances are received by a collection centre and deposited in the bank after processing. The purpose of the lock box is to eliminate the time lag between the receipt of remittances by the company and the deposit in the bank. The lock box arrangement usually is on regional basis, which a company chooses according to the billing patterns.

   Under this arrangement, the company rents the local post office box and authorises its bank at each of the locations to pick up remittances in the boxes. Customers are billed with instructions to mail their remittances to the local box. The bank picks up the mail several times a day and" deposits the cheques in the company's account.

5. **Concentration Banking :** In this system the company establishes a number of strategic collection centres in different regions instead of a single collection centre at the Head Office. This system reduce the period between the time a customer mails in his remittances and the same when they become spendable funds with the company. Payments received by the different collection centres are deposited with their respective local banks which in turn transfers all surplus funds to the concentration bank. The concentration bank with which the company has its major bank account is generally located at the head quarter.

6. **Showing Disbursements :** The operating cash requirement can be reduced by slow disbursement of A/c payable. The slow disbursement represents a source of fund requiring no interest payment. Some of the technique for the payment delay of A/c receivable are,

   i) **Avoidance of Early Payments :** A firm is require to pay a payment within a period of time which lead to cash discount. If the payment is delayed beyond the due date, the firm later find the difficulty to secure credit.

   ii) **Centralised Disbursements :** All the payment, the firm has to pay should be made by the head office from the centralised disbursement A/c. This may help the firm to delay cash payment and conversion for several reasons. This is due to transit time i.e., more mailing time.

   For reduction in operation cost, a firm has small total cash balance. This will have to maintain in each branch will add to a large operating cash balance.

iii) **Float :** It is the amount of money which is available in cheque, which is written and not yet to be collected and an cashed. The float is a difference between bank balance and cash balance as shown by the firm record and actual bank balance. The actual bank balance is due to processing delay. Due to the lag in between the cheque kitting method is used to make processing the funds and to keep in an interesting form of delay in payment.

iv) **Accrual :** It is the current liabilities that represents a service received by the firm but not yet paid for the receipt and payment by the firm which extend for a period or a week. The longer the period i.e., payment is made, the greater the amount of free financing and the smaller is the amount of cash balance require.

This can load to manipulated to slow down disbursement.

## 5.2 Marketable Securities

### 5.2.1 Characteristics

**Q11. Define Marketable Securities. Explain the characteristics of Marketable Securities.**

*Ans :*

The marketable securities are the type of money market instrument which is highly liquid and can be easily convertible into cash within the short period of time. It is very much essential for the firm to maintain adequate cash balance for the smooth running/operations of the business as the inflows and outflows of cash are uncertain and un-synchronized.

The management of investment in marketable securities constitute the most essential function of financial management. Both cash and marketable securities are short term money market instruments hence, the cash management with regards to the investment in marketable securities need to be carefully dealt.

Many time, the firms receive more cash than what is actually needed for making immediate payments, which may be treated as surplus cash and its needs to be pooled up in the marketing securities instead of keeping them idle. In this way, surplus cash can be optimally allocated for earning more income to the business. The management of marketable securities deals with,

i) Determination of the amount of marketable securities to be maintained.

ii) Selection of best alternative from the group of alternative securities.

**Characteristics of Marketable Securities**

The characteristics of marketable securities have an impact on their marketability or liquidity. For becoming liquid, a security should have two main characteristics which are as follows,

1. Ready market and
2. Safety of principle.

**1. Ready Market**

Because of ready marketability feature, securities can be easily converted into cash without consuming much time. A ready market is characterized by the presence of several participants, which are spread over a wide geographical area and must have where large number of securities can be traded (either purchased or sold).

**2. Safety of Principle**

This is the nd determinant of liquidity in which there is less or even no loss in the value of marketable security over time. According to the principle of safety, short term investments can be made in only those securities that can be easily converted into cash without reducing its notional value or principle amount. However, if there is a considerable reduction in the principal amount then firm should not invest surplus cash balance into any type of security.

### 5.2.2 Selection Criterion

**Q12. State the various factors does the financial management consider for selecting a proper marketable securities.**

*Ans :*

A finance manager has to take a decision regarding the determination of mix of cash and marketable securities. The choice of mix is based on trade off between the opportunity to earn a return on cash which is known as idle fund. This can be done during the holding period. The brokerage costs associated with the purchase and sale of the marketable securities.

The interest should be earned on the security. The key factor of interest trade off is the return and the brokerage cost of liquid assets. The liquid assets should be held in the form of marketable securities.

There are three basic motives for maintaining the marketable securities are,

1. Transaction motives.
2. Safety/Precaution motives.
3. Speculative motives.

The basic need of the motives is being depends on the return of idle fund. So this type of the marketable security are purchase will depends on the purchase of motives. A finance manager have to maintain a procedure for a marketable security mix. This can be done by,

1. Financial risk
2. Interest rate risk
3. Taxability
4. Liquidity
5. Yield.

**1. Financial Risk**

Financial risk is also known as default risk. It is the uncertainty of expected return attributable to possible change in financial capacity of issues of security to make future payments.

In this type, if there is default in investment is high then the financial risk is also high, if investment is lower then the financial risk would be lower.

The marketable securities are designed according to return of finds, that tied up with idle cash for transaction purpose. This may tends to the financial manager to assume as the financial risk with high return can get with in the portfolio.

**2. Interest Rate Risk**

The uncertainty which associated with the expected return from a financial instrument attributable to change in interest rate is known as Interest rate risk. In this type the interest rate will depends on the date of purchase. The longer the maturity of instrument, the larger will be fall in price.

A financial manager would have make a new investments issue as the price of security will fall according to the yield to maturity.

**3. Taxability**

The impact of tax is also effects the market yield difference. The differential impacts on yield is due to interest income, which is taxed with the ordinary tax rate the capital gain and tax at a lower rate. The discount on lower interest securities and their yield to maturity tends to be lower. The greater the discount, the better the capital gain.

**4. Liquidity**

The ability to transfer a security into cash. These are basically depends on the marketable security portfolio. If a finance manager wants cash immediately, then a portion of portfolio might have to be sold. This may require a large price reduction in order to convert the securities.

This can be done according to the market portfolio. The instrumentation consideration can be done by,

i) The required time taken to sell the securities.

ii) The security can sold or prevail the market.

**5. Yield**

The yield is the final selection of the marketable securities. These are being available on the different financial assets which include marketable near cash portfolio. The all four factors such as financial risk, interest rate risk, liquidity and taxability, influence the available need of financial instruments.

It a given risk is assumed, then a higher yield may be expected. This may be expect on lack of liquidity characteristics.

The manager who is trade off the securities should focus on factor. This factors helps the finance manager to determine proper marketable security mix for his organisation.

## 5.3 Management of Receivables

**Q13. Define receivable management. Explain the factors influencing receivable management.**

*Ans :*

The term receivable is defined as "debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business". When a firm sells its products or services on credit, and it does not receive cash immediately, but would be collected in the near future. Till collection, they form as current assets.

Receivables are one of the important elements of current assets of the firm. The word receivables can be explained as 'debt owed to the firm by customers arising from sale of goods or service in the ordinary course of business'.

When payment for sale of goods or services is due then firm provides trade credit to its customers and creates accounts receivables which can be acquired in future. Receivable management is also known as trade credit management. Hence, accounts receivable express the adequate time period in which customer must make payment for goods purchased. The firms provide trade credit in order to protect the sales from the competitors and attract customers who can purchase their products at reasonable prices.

**Factors influencing the size of receivables**

**(i) Size of Credit Sales**

The volume of credit sales is the first factor which increases or decreases the size of receivables. If a concern sells only on cash basis, as in the case of Bata Shoe Company, then there will be no receivables. The higher the part of credit sales out of total sales, figures of receivables will also be more or vice versa.

**(ii) Credit Policies**

A firm with conservative credit policy will have a low size of receivables while a firm with liberal credit policy will be increasing this figure. The vigour with which the concern collects the receivables also affects its receivables. If collections are prompt then even if credit is liberally extended the size of receivables will remain under control. In case receivables remain outstanding for a longer period, there is always a possibility of bad debts.

**(iii) Terms of Trade**

The size of receivables also depends upon the terms of trade. The period of credit allowed and rates of discount given are linked with receivable. If credit period allowed is more then receivables will also be more. Sometimes trade policies of competitor have to be followed otherwise it becomes difficult to expand the sales. The trade terms once followed cannot be changed without adversely affecting sales opportunities.

**(iv) Expansion Plans**

When a concern wants to expand its activities, it will have to enter new markets. To attract customers, it will give incentives in the form of credit facilities. The period of credit can be reduced when the firm is able to get permanent customers.

**(v) Relation with Profits**

The credit policy is followed with a view to increase sales. When sales increase beyond a certain level the additional costs incurred are less than the increase in revenues. It will be beneficial to increase sales beyond a point because it will bring more profits. The increase in profit will be followed by an increase in the size of receivables or vice-versa.

**vi) Credit Collection Efforts**

The collection of credit should be streamlined. The customers should be sent periodical reminders if they fail to pay in time. If adequate attention is not paid towards credit collection then the concern can land itself in a serious financial problem. An efficient credit collection machinery will reduce the size of receivables. If these efforts are slower then outstanding amounts will be more.

**vii) Habits of Customers**

The paying habits of customers also have a bearing on the size of receivable. The customers may be in the habit of delaying payments even though they are financially sound. The concern should remain in touch with such customers and should make them relate the urgency of their needs.

**Q14. Explain the importance of Receivable Management.**

*Ans :*

The importance of receivables management is as follows:

1. Liberalised credit policy helps to increase the growth of sales.
2. It helps to increase the operating profits because of more credit sales.
3. Credit policy helps to meet the competition.
4. Credit sales helps to attract not only existing customer but also the new customers in the ordinary course of business.
5. It ensures higher investment in trade debtors, which will produce larger sales.
6. It helps to minimize bad debts without taking stringent measures.
7. It facilitates adequate working capital to meet its current obligations.
8. It gives guidance to the management for effective financial planning and control.
9. It helps to make effective coordination between finance, production, sales, profit and cost.

### 5.3.1 Credit Policy

**Q15. Define Credit Policy. Explain advantages and disadvantages of credit policy.**

*Ans :*

**Credit Policy**

It is the policy where the seller sells goods on very liberal credit terms and standards. In other words, goods are sold to the customers whose creditworthiness is not up to the standards or whose financial position is doubtful.

**Advantages of Credit Policy.**

- **Increase in Sales:** Lenient credit policy increases sales because of the liberal credit terms and favourable incentives granted to customers.
- **Higher Profits:** Increase in sales leads to increase in profits, because higher level of production and sales reduces fixed cost.

**Disadvantages of Credit Policy**

Apart from the advantages it has some disadvantages

- **Bad Debt Loss**

  A firm that follows a lenient credit policy may suffer from bad debt losses that arise due to the non-payment of credit sales.

- **Liquidity Problem**

  Lenient credit policy not only increases bad debt losses but also creates liquidity problem, because when the firm is not able to receive the payment by a due date, it may become difficult to pay currently maturing obligations.

**Q16. Discuss the components of credit policy variables.**

*Ans :*

The credit policy variables have a bearing on level of sales, bad debt loss, discounts taken by customers, and the collection expenses. The major credit policy variable include the following:

(A) Credit Standards

(B) Credit Terms, and

(C) Collection Policy and Procedures.

**(A) Credit Standards**

Firm has to select some customers for extension of credit. For this, the firm has to evaluate the customer. In evaluation of customers what standards should be applied? Credit standards refer to the minimum criteria for the extension of credit to a customer. Credit ratings, credit references, average payment periods, and certain financial ratios provide a quantitative basis for establishing and enforcing credit standards. Firm's decision, to accept or reject a customer to extend credit depends on credit standards. Firms may have more number of standards in this respect, but at one point it may decide not to extend credit to any customer, even though his/her credit rating is strong. On the other point, firm may decide to provide goods on credit to all customers irrespective of their creditworthiness. Practical ones lies between these two points.

**(B) Credit Terms**

The second decision criteria in receivables management is the credit terms. Credit terms means the stipulations under which goods or services are sold on credit. Once the credit terms have been established and the creditworthiness of the customers has been assessed, then the financial manager has to decide the terms and conditions on, which the creditwill be granted. The credit terms specify the length oftime over which credit is extended to a customer and the discount, if any, given for early payment. Credit terms have three components such as: (i) credit period, and (ii) cash discount, and (iii) cash discount period.

(i) **Credit Period:** The period of time, for which credit is allowed to a customer to economic value of purchases. It is generally expressed in terms of a net data [i.e., if a firm's credit terms are "net 60"], it is understandable that payment will be made within 60 days from the date to credit sales. Generally, the credit period is decided with the consideration of industry norms and depending on the firm's ability to manage receivables.

(ii) **Cash Discount:** The second part of credit terms is cash discount. Cash discount represents a percent reduction in sales or purchase price allowed for early payment of invoices. It is an incentive for credit customers to pay invoices in a timely fashion. In other words, it encourages the customers to pay credit obligations within a specified period of time, which will be less than the normal credit period.

(iii) **Cash Discount Period:** It refers to the duration during which the discount can be availed of, collection of receivable is influenced by the cash discount period. Extension of cash discount period may prompt some more customers to avail discount and more payments, which will release additional funds. But extension of cash discount period will result in late collection of funds, because the customers who are able to pay less cash discount now may delay their payments.

**(C) Collection Policy**

This is the third aspect in receivables management. The collection policy of a firm is the procedure passed to collect amount receivables, when they become due. It is needed because all customers do not pay the bill receivables on time. Collection procedures include monitoring the state of receivables, dispatch of letters to customers whose due date is approaching, electronic and telephonic advice to customers around the due date, threat of legal action to overdue customers, and legal action against overdue account.

**Q17. What are credit standards ? What key variables should be considered in evaluating possible changes in credit standards ?**

*Ans :* **(Dec.-19)**

The credit standards of a company lay down minimum requirement for the evaluation of credit to its customers. The company may define these requirements in the very conservative or a strict manner and this restrain the marginal customers are those whose financial position is doubtful may not really be bad. Such a policy would be appropriate for the companies which do not want to take high risk or alternatively, the company may follow a very liberal standard and be very aggressive in taking the risk.

The company uses some of the following quantitative indicators for establishing credit standards:

(a) Payment period

(b) Selecting financial rates

(c) Rating based on financial ratios.

The subjective assessment obtained through the market about the credit worthiness of the customers may also feature as one of the item in the credit standards. These quantitative and subjective indicators may provide the basis for establishing and enforcing the credit standards.

At any point of time, the company would be interested in examining the effect of change in credit standards. This is done by comparing the profitability generated by lowering down the credit standards and the added cost of accounts receivable. So long as the profitability is more than the added cost, the company can lower down the credit standards. It is important to determine the costs of lowering down the credit standards and also to find out the impact on profitability of the company. Lowering down toe the credit standards would have the following effects:

i) Increase in average collection period.

ii) Increase in sales.

iii) Increase in accounts receivable investment.

iv) Increase in bad debts losses, and

v) Increase in servicing cost of account receivable.

The effect of lowering down the credit standards on key variables such as sale and investment in accounts receivable "can be quantified by the costs versus benefits of such changes". At the time of the cost such as increase in bad debt losses and increased cost of monitoring and servicing the accounts receivable should also be considered. It may be very difficult for the firm to make any distinction between the credit standards for new customers and existing customers. Relaxing the credit standards for the new customers would have certainly some impact on the payment behavior of existing customers. The firm may experience collection period.

The following approach in assessing the effects of lowering down the credit standard:

- Determine, find out the profitability of additional sales.
- Determine increase in bad debt losses, collection expenses and any other cost arising from relaxing the standards.
- Determine increase slowness of the average collection period and additional amount of investment requirement in accounts receivable and multiply it by the required rate of return on investment in accounts receivable.

### 5.3.2 Credit evaluation of individual accounts

**Q18. Discuss the evaluation of individual accounts.**

*Ans :*

Evaluation of individual accounts is the prime activity, which affects firm's profitability. In this, the firm should develop procedures for evaluating credit applicants and consider the possibilities of bad debt or slow payment. Mere determination of appropriate credit policy will not serve the purpose of minimising investment in receivables and reducing bad debt losses, without credit evaluation of individual accounts and identification of their creditworthiness.

The credit evaluation procedure involves three related steps: viz., (1) obtaining credit information, (2) analysing the information, and (3) making the credit decision.

**1. Obtaining Credit Information**

Credit should be granted to those customers who have the ability to make payment on time. To ensure this, a firm should have to evaluate the individual accounts properly, for which it requires information. Hence, there is a need to obtain information. Collection of credit information involves some cost. Some accounts, small accounts, the cost of collecting information may outweigh the potential profitability of the account. In addition, the cost, the firm must consider the time factor in collecting information.

The information may be divided into two sources, such as (a) internal source and (b) external source. The following secondary sources are available for the collection of credit information.

**(a) Internal Sources:** Internal source is the source that is available within the organisation and it provides information at free cost. This type of source is useful only for evaluating existing customers) A particular customer may have enjoyed credit facility in the past. Now for extension of credit period or cash discount firm may ask the internal receivable department to provide past record, based on which firm may make decisions.

**(b) External Sources:** External sources of information are very important when a firm is planning to evaluate a new customer. Secondary source of information is available based on the development of institutional agencies facilities and industry practices. India, has made little progress in the matter of developing the sources of credit information in the name of secrecy and confidentiality.

**2. Analysis of Information/Credit Analysis**

After having collected the required information about the applicant from different sources, the information should be analysed to determine the creditworthiness of the prospective customers. There are no tailor made procedures to analyse the credit information that are suitable to one. The analysis should cover two aspects, (a) Quantitative, and (b) Qualitative.

**(a) Quantitative**: This type of assessment is very useful, which is done on the basis of financial statements, and firm's past records. Preparation of aging schedule is the prime one. Aging schedule is the statement showing age-wise distribution of receivables (Bills). It gives a clear picture into the past payment pattern of the applicant. Next the firm can go for ratio analysis, where it can study liquidity, profitability and debt capacity of the perspective customer. Calculated ratios must be compared with industry ratios (standards).

**(b) Qualitative:** Evaluation of prospective customer from the quantitative analysis point, sometimes it should be fortified by qualitative analysis for interpretation of credit- worthiness. Qualitative analysis would cover the aspects relating to quality of management, management philosophy, management vision, etc. The stated external sources may form the basis for conclusions to be drawn.

The above-mentioned are the two methods of evaluation. But traditional credit analysis takes 6C's into consideration.

- **(i) Character:** It is the prime 'C' in as much as it means the moral integrity and noble intentions and willingness on the part of the prospective buyers to honour the obligations of making the full payments on the due date because, there may be cases, where the buyer may be able to pay but may not have the good intention to do so.
- **(ii) Capacity**: It means the ability of prospective customers to pay. In other words, customer capacity is the financial capability to make the payment on the due date.
- **(iii) Capital:** It refers to the capital base and capital structure of the company. If the applicant is a person then capital refers to the personal assets value of the customer. In any case, the value should be more than the goods that are going to be sold on credit.
- **(iv) Collateral:** It means offering assets as a pledge against providing credit. It acts as a cushion, when the above three C's are not sufficient to take decisions.
- **(v) Conditions:** The term 'condition' here refers to the economic conditions and climate providing at the material time, which may have favourable of unfavourable impact on the financial position and prospects of the prospective customer.
- **(vi) Case History [past experience] :** If the credit extension decision relates to an existing customer then there is a need to go back to old needs and check customer's record.

**3. Making Credit Decision**

The prime objective of evaluation of prospective customer creditworthiness is to assess whether he/she is worthy of granting the credit or not. Actual creditworthiness is compared with the pre-determined standards, if the actual are up to the standards or above to the standards, goods would be provided on credit, and vice versa. Credit decision is difficult to make when the creditworthiness is marginal. Decision can be taken only, after comparing the benefits of credit extension with likely bad debt losses.

**Q19. Discuss the role of factors in credit management system.**

*Ans :* **(July-18)**

Credit management system can be managed with the help of following four factors,

1. Credit policy variables
2. Credit evaluation
3. Credit granting decision
4. Control of receivables.

**1. Credit Policy Variables**

It is the policy where the seller sells goods on very liberal credit terms and standards. In other words, goods are sold to the customers whose creditworthiness is not up to the standards or whose financial position is doubtful.

**2. Credit Evaluation**

A firm must analyze the credit worthiness of a prospective customer before offering credit. Credit worthiness can be identified by considering three basic factors i.e., character, capacity and collateral. A firm can also identify credit worthiness of customer by analyzing financial statements, by acquiring bank reference, by evaluating experience of firm and by considering numerical credit scoring of a customer.

**3. Credit Granting Decision**

Credit granting decision must be taken after identifying credit worthiness of the customer. Decision tree is useful in taking these type of decisions.

**4. Control of Receivables**

Receivables are controlled by using two traditional methods i.e days sales outstanding and aging schedule. These methods are very popular but they have some drawbacks as they are based on aggregation of sales and receivables. Payment pattern approach is recommended to overcome the drawbacks of traditional methods.

### 5.3.3 Monitoring Receivables

**Q20. Explain the various techniques are used in monitoring receivables.**

*Ans :*

There are traditional techniques available for monitoring accounts receivables. They are

1. Receivables turnover,
2. Average Collection period,
3. Aging Schedule and
4. Collection matrix.

**1. Receivables Turnover**

Receivables turnover provides relationship between credit sales and debtors (receivables) of a firm. It indicates how quickly receivables or debtors are converted into cash. Ramamurthy observes “collection of debtors is the concluding stage for process of sales transaction. The liquidity of receivables is, therefore, measured through the receivables (debtors) turnover rate.

| Receivables Turnover Rate = Credit Sales Average Debtors or receivables |
|---|

Debtors turnover rate is expressed in terms of times. Analyst may not be able to access credit sales information, average debtors and bills receivables.

To avoid non-availability of the above information and to evaluate receivables turnover there is another method available for the analyst.

| Receivables Turnover Rate = Total Net Sales + Average Debtors (including receivables) |
|---|

**2. Average Collection Period (ACP)**

Turnover rate converted into average collection period is a significant measure of the collection activities of debtors. Average collection period is a measure of how long it takes from the time sales is made to the time cash is collected from the customers

ACP = 365 Debtors or Receivables turnover.

**3. Aging Schedule**

Aging schedule is a statement that shows age-wise grouping of debtors. In other words, it breaks down debtors according to the length of time for which they have been outstanding.

Aging schedule is helpful for identifying slow paying debtors, with which the firm may have to encounter a stringent collection policy. The actual aging schedule of the firm is compared with industry standard aging schedule or with benchmark aging schedule for deciding the debtors are in control or not.

**4. Collection Matrix**

Traditional methods (debtors turnover rate, average collection period) of receivables management are very popular, but they have limitations, that they are on aggregate data and fail to relate the outstanding accounts receivables of a period with credit sales of the same period. The problem of aggregating data can be eliminated by preparing and analysing collection matrix.

## PROBLEMS ON RECEIVABLE MANAGEMENT

**5. The following information is available for a company :**

| | |
|---|---|
| **Monthly credit sales** | **Rs.10,00,000** |
| **Average maturity period** | **40 days** |
| **Factor fees/commission** | **1%** |
| **Interest rate charged by factor** | **15%** |
| **Collection department's cost (if there is no factoring)** | **Rs. 4,500 per month** |
| **Factor's average remittance period** | **10 days** |
| **The company's cost of raising funds (other than factor)** | **24%** |

**Calculate the effective interest rate charged by the factor and advise the company ignoring all other factors including risk of default.**

*Sol :*

1. Number of days for which the funds are advanced by the factor

   = 40 – 10 = 30 days.

2. Calculation of total costs of financing through factor :

| Particulars | Amount |
|---|---|
| Factor's fee and commission $\left(10,00,000 \times \frac{1}{100}\right)$ | 10,000 |
| Interest charges $\left(10,00,000 \times \frac{15}{100} \times \frac{30}{360}\right)$ | 12,500 |
| Total of fee and interest charges | 22,500 |
| Less : Saving in collection department's cost | 4,500 |
| Total financing cost (Net) | 18,000 |

3. Calculation of effective interest rate :

$$\frac{18,000}{10,00,000} \times \frac{365}{30} \times 100 = 21.90\%$$

4. As the effective rate of interest charged by the factor is 21.90% and the firm can raise funds from other sources at 24% p.a. it is advised that the firm should avail the services of the factor.

**6. Bharat Ltd. decides to liberalise credit to increase its sales. The liberalised credit policy will bring additional sales of Rs. 3,00,000. The variable costs will be 60% of sales and there will be 10% risk for non-payment and 5% collection costs. Will the company benefit from the new credit policy ?**

*Sol :*

| Particulars | Amount |
|---|---|
| Additional Sales revenue | 3,00,000 |
| **Less :** Variable Cost (60%) | 1,80,000 |
| Incremental Revenue | 1,20,000 |
| **Less :** 10% for non-payment risk | 30,000 |
| | 90,000 |
| **Less :** 5% for costs of collection | 15,000 |
| Additional Revenue from increased sales due to liberal credit policy | 75,000 |

The company will be benefitted from the new credit policy because the increase in revenue is more than the costs of providing additional credit. In fact, the profit of the company will increase by Rs. 75,000.

**7. Dryson Ltd. provides the following informations :**

| Particulars | Amount |
|---|---|
| **Cash sales during the year** | **1,50,000** |
| **Credit sales during the year** | **2,70,000** |
| **Returns inward** | **20,000** |
| **Trade debtors in the beginning** | **55,000** |
| **Trade debtors at the end** | **45,000** |
| **Provision for bad and doubtful debts** | **5,000** |

**Calculate :**

**(i) Debtors Turnover Ratio**

**(ii) Average Collection Period**

**Note : Take 360 days in a year and all returns are from credit sales.**

*Sol :*

(i) Debtors Turnover Ratio = $\frac{\text{Net Credit Annual Sales}}{\text{Average Trade Debtors}} = \frac{2{,}70{,}000 - 20{,}000}{(55{,}000 + 45{,}000) \times \frac{1}{2}} = \frac{2{,}50{,}000}{50{,}000} = 5 \text{ times}$

(ii) Average Collection Period = $\frac{\text{No. of Working Days}}{\text{Debtors Turnover Ratio}} = \frac{360}{5} = 75 \text{ days}$

(OR) Average Collection Period = $\frac{\text{Average Trade Debtors} \times \text{No. of Working Days}}{\text{Net Credit Sales}}$

$= \frac{50{,}000 \times 360}{2{,}50{,}000} = 72 \text{ days.}$

## 5.4 Factoring

**Q21. Define factoring. Explain the features of factoring.**

*Ans :*

Factoring is a fund-based financial service which provides resources to finance receivables and facilitates the collection of receivables. Factoring is defined as a method of financing whereby a company sells its trade debts at a discount to a financial institution. It is a continuous arrangement between a financial institution and a company which sells goods and services to trade customers on credit.

**Definition of Factoring**

**According to Robert W. Johnson,** Factoring is a service involving the purchase by a financial organisation, called a factor of receivables owned to manufacturers and distributors by their customers with the factor assuming full credit and collection responsibilities.

Factoring means an arrangement between a factor and his client which includes at least two of the following services :

a) Finance

b) Maintenance of accounts

c) Collection of debts

d) Protection against credit risk

**Features of Factoring**

1. **Improved Cash Flow**

   A better cash flow helps to save time and money, leads to greater profits and increases confidence in future planning.

2. **Flexibility**

   Factoring/Discounting is one of the most flexible forms of finance available to business, as the available funds increase with the value of the credit-approved invoices.

3. **Costs**

   Factors/Discounters usually charge a service fee plus interest on funds utilised. The fees depend on volume of sales and the level of services that are provided.

4. **Collections**

   With its professionalism and weight in the marketplace, a Factor can often collect debts more quickly and effectively then a small independent business.

5. **Credit Managemen**

   The Factor/Discounter can provide the business with regular, up-to-date information on the status of its sales ledger and the performance fits trade debtors.

6. **Credit Protection**

   The Factor/Discounter undertakes credit checks on the business's debtors and may set a rate for credit protection under a non-recourse arrangement. The Factor/Discounter will pay the business, regardless of whether the invoice has been paid.

7. **Credit Assessment**

   A Factor/Discounter has access to credit reference databases that many businesses may not be able to afford. A Factor/Discounter can advise the business on the credit-worthiness of current and potential debtors.

**Q22. Explain the functions of Factor / Factoring.**

*Ans :*

A factor performs the following functions :

**(a) Administration of Sales Ledger**

The factor maintains the client's sales ledgers. On transacting a sales deal, an invoice is sent by the client to the customer and a copy of the same is sent to the factor. The ledge is maintained under the open-tem method. The customer's account clearly reflects the various open invoices outstanding on any given date. The factor also gives periodic reports to the client on the current status of his receivables , receipts of payments from the customers and other useful information.

**(b) Provision of Collection Facility**

The factor undertakes to collect the receivables on behalf of the client relieving him of the problems involved in collection and enables him to concentrate on other important functional areas of his business. This also enables the client to reduce the cost of collection by way of savings in manpower, time and efforts.

**(c) Financing Trade Debts**

The factor purchases the book debts of his client at a price and the debts are assigned in favour of the factor that is usually willing to grant advance to the extent of 80-85 % of the assigned debts. The balance 15-20 % is retained as a factor reserve.

**(d) Credit Control and Credit Protection**

This service is provided where debts are factored without recourse. The factor in consultation with the client fixes credit limits for approved customers. Within these limits, the factor undertakes to purchase all trade debts of the customer without recourse. There are two important benefits to the client. They are,

i) Factoring relieves the client of the collection work

ii) With access to extensive information available on the financial standing and credit rating of individual customers and their track record of payments

Thus the factor is able to advise the client on the credit worthiness of potential customers leading to better credit control.

**(e) Advisory Services**

These services are spin-offs of the close relationship between a factor and a client. By virtue of their specialised knowledge and experience in finance and credit dealings and access to extensive credit information, factors can provide a variety of incidental advisory services to their clients.

**(f) Cost of Services**

The factors provide the various services at a charge. The charge for collection and sales ledger administration is in the form of a commission expressed as a percent of the value of debt purchased. It is collected in advance.

**Q23. Explain the classification of factoring.**

*Ans :*

**Types/Classification of Factoring**

**1. Full Service Factoring**

Under this type, a factor provides all kinds of services. Thus, a factor provides finance, administers the sales ledger, collects the debts at his risk and renders consultancy service. This type of factoring is a standard one. It is also called without recourse factoring.

**2. With Recourse Factoring**

Under this type, the factor does not assume the credit risk. If the debtors do not repay their dues in time and if their debts are outstanding beyond a fixed period, such debts are automatically assigned back to the client. The client has to take up the work of collection of overdue account by himself.

**3. Maturity Factoring**

Under this type, a factor does not provide immediate cash payment to the client at the time of assignment of debts. He undertakes to pay cash as and when collections are made from the debtors. The entire amount collected less factoring fees is paid to the client immediately. So it is also called collection factoring.

**4. Bulk Factoring**

Under this type, the factor provides finance after disclosing the fact of assignment of debts to the debtors concerned. This type of factoring is resorted to when the factor is not fully satisfied with the financial condition of the client. The work relating to sales ledger administration, credit control, collection work etc has to be done by the client himself. It is also called as Disclosed Factoring or Notified Factoring.

**5. Invoice Factoring**

Under this type, the factor provides finance against invoices without undertaking any other functions. All works connected with sales administration, collection of dues etc. Have to be done by the client himself. This type of factoring is very confidential in nature and hence it is called Undisclosed or Confidential Invoice Factoring.

**6. Agency Factoring**

Under this type, the factor and the client share the work between themselves. The client looks after the sales ledger administration and collection work and the factor has to provide finance and assume the credit risk.

**7. International Factoring**

Under this type, the services of a factor in a domestic business are extended to international business. Factoring is done on the basis of the invoice prepared by the exporter. The exporter is able to get immediate cash to the extent of the 80% of the export invoice under this type of factoring.

**8. Limited Factoring**

Under this type, the factor does not take up all the invoices of a client. He discounts only the selected invoices on merit basis and converts credit bills into cash in respect of those bills only.

**Q24. Explain the Working Mechanism of Factoring.**

*Ans :*

Factoring business is generated by credit sales in the normal course of business. The main function of factor is realization of sales. Once the transaction takes place, the role of factor steps, is to realize the sales/collect receivables. Thus, factor acts as an intermediary between the seller and sometimes along with the seller's bank together.

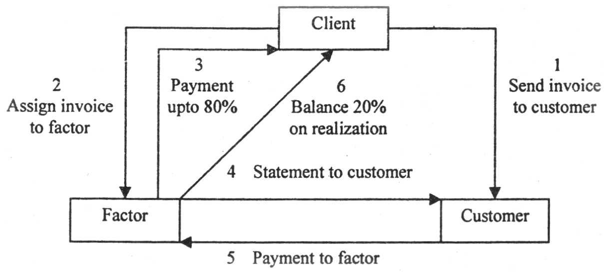



**Figure: Working of Factoring**

When the payment is received by the factor, the account of the firm is credited by the factor after deducting its fees, charges, interest, etc., as agreed.

The mechanism of factoring can be explained with the help of the following figure.

1. Customer places an order with the client for goods and/or service on credit; client delivers the goods and sends invoice to customers.
2. Client assigns invoice to factor.
3. Factor makes pre-payment upto 80 percent and sends periodical statements.
4. Monthly statement of accounts to customer and follow-up.
5. Customer makes payment to factor.
6. Factor makes balance 20 percent payment on realization to the client.

**Q25. Explain the advantages and dis-advantages of Factoring.**

*Ans :*

**Advantages of Factoring**

**1. Financial Service**

Many of the manufacturers and traders find their working capital being locked up in the form of trade debts. The major benefit of the factoring service is that the clients will be able to covert their trade debts into cash upto 80% immediately as soon as the credit sales are over. The greatest advantage is that factoring assures immediate cash flow. When the cash position improves, the client is able to make his purchases on cash basis and thus he can avail of cash discount facilities also.

**2. Collection Service**

Collection of debts in a problematic area for many concerns. Delay in collection process often leads to delay n production and supplies. This collection work is completely taken up by the factoring organization, leaving the client to concentrate on production along. The cost of collection is also cut down as a result of the professional expertise of a factor.

**3. Credit Risk Service**

In the absence of a factor, the entire credit risk has to be borne by the client himself. Once the factoring relationship is established, the client need not bother about the loss due to bad debts. The factor assumes the risk of default in payment by customers and thus, the client is assured of complete realization of his book debts. Even is the customer fails to pay the debt, it becomes the responsibility of the factor to pay that amount to the client. It is the greatest advantage of factoring.

**4. Provision of Expertise Sales Ledger Management Service**

Administration of sales ledger is the factor's responsibility. It is the factor's responsibility to take care of all the functions relating to the maintenance of sales ledger. Factoring offers an excellent credit control for the client.

**5. Consultancy Services**

Factors helps the clients avoid poor quality and risky customers. They also advise their clients on important financial matters.

**Disadvantages of the Factoring**

**1. The Stigma**

The most common thing small business owners don't know about factoring, Napolitano says, is that their customers are notified when a factor takes the receivables over. "The customers are no longer paying you, they're paying the factoring company," he says. That may alert them to your cash flow trouble.

**2. Less Control**

Once you accept cash for your receivables, you give up a measure of control. For example, the factoring company could deny your ability to do business with a particular customer because of its poor credit history or rating, says Napolitano.

**3. The Cost**

While it may be necessary to have immediate access to cash, it will come at higher price than loans. Factoring companies usually keep between 1% and 4% of a receivable as their fee. Additionally, Napolitano says, they charge interest on the cash advance, typically at prime rate plus 2%. That all can add up to more than 30% in annual interest.

## 5.5 Management of Inventory

**Q26. Define inventory management. Explain the components of inventory.**

*Ans :* **(Sep.-16)**

The term "Inventory" has originated from the French word "Inventaire" and the Latin word "Inventariom" which implies a list of things found. The term inventory has been defined by the American Institute of Accountants as the aggregate of those items of tangible personal property which

(a) are held for sale in the ordinary course of business,

(b) are in the process of production for such sales, or

(c) are to be currently consumed in the production of goods (or) services to be available for sale. The term inventory refers to the stockpile of the products a firm is offering for sales and the components that make up the product. Inventories are the stocks of the product of a company, manufacturing for sale and the components that make up the product.

The various forms in which inventories exist in a manufacturing company are:

(i) raw materials,

(ii) work-in process,

(iii) finished goods, and

(iv) stores & spares. However, in commercial parlance, inventory usually includes stores, raw materials, work-in-process and finished goods. The term inventory includes - raw materials, work-in-process, finished goods packaging, spares and others stocked in order to meet an unexpected demand or distribution in the future.

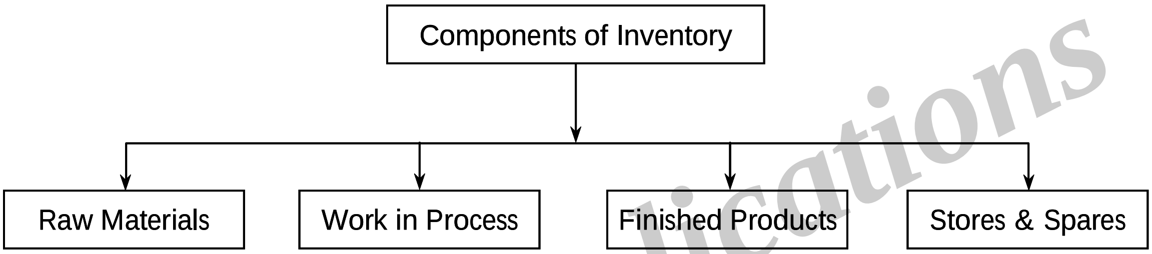
**Components of Inventory**

**1. Raw Materials**

Raw materials are those inputs that are converted into finished goods through the manufacturing process. These form a major input for manufacturing a product. In other words, they are very much needed for uninterrupted production.

**2. Work-in-Process**

Work-in-process is that stage of stocks that are between raw materials and finished goods. Work-in-process inventories are semi-finished products. They represent the products that need to undergo some other process to become finished goods.




**3. Finished Products**

Finished products are those products, which are ready for sale. The stock of finished goods provides a buffer between production and market

**4. Stores & Spares**

Stores & spares inventory (include office and plant cleaning materials like, soap, brooms, oil, fuel, light bulbs, etc.,) are those purchased and stored for the purpose of maintenance of machinery.

**Q27. Explain various types of inventory.**

*Ans :*

There are various types of inventory which are as follows :

**1. Movement Inventories**

Movement inventories are also called transit or pipeline inventories. Their existence owes to the fact that transportation time is involved in transferring substantial amounts of resources.

**For example,** when coal is transported from the coalified to an industrial town by trains, then the coal, while in the transit, cannot provide any service to the customers for power generation or for burning in furnaces.

**2. Buffer Inventories**

Buffer inventories are held to protect against the uncertainties of demand and supply. An organization generally knows the average demand for various items that it needs. However, the actual demand may not exactly match the average and could well exceed it. To meet this kind of a situation, inventories may be held in excess of the average for expected demand. Similarly, the average delivery time (that is, the time elapsing between placing an order and having the goods in stock ready for use, and technically called as the *lead time)* may be known. But unpredictable events could cause the actual delivery time to be more than the average.

Thus, excess stocks might be kept in order to meet the demand during the time for which the delivery is delayed. These inventories which are in excess of those necessary just to meet the average demand (during the average lead time period), held for protecting against the fluctuations in demand and lead-time are known also by the term **safety stocks.**

### 3. Anticipation Inventories

Anticipation inventories are held for the reason that a future demand for the product is anticipated. Production of specialized times like crackers well before Diwali, umbrellas and raincoats before rains set in, fans while summers are approaching; or the piling up of inventory stocks when a strike is on the anvil, are all examples of anticipation inventories.

### 4. Decoupling Inventories

The idea of the decoupling inventories is to decouple, or disengage, different parts of the production system. As we can observe easily, different machines/equipment and people normally work at different rates: some slower and some faster. A machine,

**For example,** might be producing half the output of the machine on which the item being handled is to be processed the next. Inventories in between the various machines are held in order to disengage the processing on those machines. In the absence of such inventories, different machines and people cannot work simultaneously on a continuous basis. When such inventories are held, then, even if a machine breaks dowm, the work on others would not stop.

### 5. Cycle Inventories

Cycle inventories are held for the reason that purchases are usually made in lots rather than for the exact amounts which may be needed at a point of time. Of course, if all purchases are made exactly as and when the item is required, there would be no cycle inventories. But, practically, purchases are made in lots, the reason being that if purchases are made frequently and in small numbers, then the cost involved in obtaining the items would be very large.

### 6. Independent Demand Inventory

Inventory item whose demand is not related to (or dependent upon) some higher level item. Demand for such items is usually thought of as forecasted demand. Independent demand inventory items are usually thought of as finished products.

### 7. Dependent Demand Inventory

Inventory item whose demand is related to (or dependent upon) some higher level item. Demand for such items is usually thought of as derived demand. Dependent demand inventory items are usually thought of as the materials, parts, components, and assemblies that make up the finished products.



**Q28. What are the main Objectives of Inventory Management?**

*Ans :*

The main objective of inventory management is to maintain inventory at appropriate level to avoid excessive or shortage of inventory because both the cases are undesirable for business. Thus, management is faced with the following conflicting objectives:

1. To keep inventory at sufficiently high level to perform production and sales activities smoothly.
2. To minimize investment in inventory at minimum level to maximize profitability.
3. To ensure that the supply of raw material & finished goods will remain continuous so that production process is not halted and demands of customers are duly met.
4. To minimize carrying cost of inventory.
5. To keep investment in inventory at optimum level.

6. To reduce the losses of theft, obsolescence & wastage etc.
7. To make arrangement for sale of slow moving items.
8. To minimize inventory ordering costs.

### 5.5.1 Inventory Management Process

**Q29. Explain the various steps involved in Inventory Management.**

*Ans :* **(Dec.-18)**

**Process of Inventory Management**

Inventory management and control refers to the planning for optimum quantities of materials at all stages in the production cycle and evolving techniques which would ensure the availability of planned inventories.

**Step 1: Determination of Optimum Inventory Levels**

Determination of inventory that an organisation should hold is a significant but difficult ; tep. Too much of inventory results in locking up of working capital accompanied by increased carrying costs (but reduced ordering costs). Excess inventories, however, guarantee uninterrupted supply of materials and components, to meet production schedules and finished goods to meet customers demand. Too less of inventory releases working capital for alternative uses and reduces carrying costs and increases ordering costs. But there is the risk of stock out costs.

**Step 2: Determination of Degree of Control**

The second aspect of inventory management is to decide just how much control is leafed to realise the objectives of inventory management. The difficulty is best overcome by classification of inventory on the basis of value. Popularly called the ABC classification, this approach is useful in deciding the degree of control. 'A' class items are 'high' in value but low' in quantity, 'C' class inventories are the opposite of 'A' group, *i.e.,* 'high' in quantity and 'low' in value. In between are the 'B' group stock which are more *or* less equal in quantity and value proportion to the total inventory. Tight control is exercised on 'A' category terns through accurate records of receipts and issues and by co-ordination of incoming shipments with production requirements. On the other hand, 'C' class items may simply be ordered in large quantities several months' need, no record being made of their issue to manufacturing. More stock is simply requested when the existing stock reaches a reorder point. The 'B' class items receive not so tight control but are not neglected either.

**Step 3: Planning and Design of the ;Inventory System**

An inventory system provides the organisational structure and the operating policies for maintaining and controlling goods to be inventoried. The system is responsible for ordering and receipt of goods, timing the order placement, and keeping track of what has been ordered, how much, and from whom.

**Step 4: Ascertaining the Organizational Arrangement Structure**

The final step of inventory management and control process is' to ascertain the organizational arrangement structure for handling and managing the inventory materials. Production planning and control departments perform the function of inventory control.

If a firm assigns the inventory control function to production planning and control department, then it can attain the following benefits,

(i) It can plan its production schedule effectively.

(ii) It will be able to issue timely orders for replenishments of stocks used in production operation.

The inventory control system is not fixed. It needs to be changed frequently as the lead time and type of consumptions keep on changing from time to time.

**Q30. Explain the Tools and Techniques of Inventory Control.**

*Ans :* **(March-16, Sep.-13)**

Effective Inventory management requires an effective control system for inventories. A proper inventory control not only helps in solving the acute problem of liquidity but also increases profits and causes substantial reduction in the working capital of the concern. The following are the important tools and techniques of inventory management and control :

### 1. Determination of Stock Levels

Carrying of too much and too little of inventories is detrimental to the firm. If the inventory level is too little, the firm will face frequent stock-outs involving heavy ordering cost and if the inventory level is too high it will be unnecessary tie-up of capital. Therefore, an efficient inventory management requires that a firm should maintain an optimum level of inventory where inventory costs are the minimum and at the same time there is no stock-out which may result in loss of sale or stoppage of production. Various stock levels are discussed as such.

#### (a) Minimum Level

This represents the quantity which must be maintained in hand at all times. If stocks are less than the minimum level then the work will stop due to shortage of materials. Following factors are taken into account while fixing minimum stock level :

- **Lead Time :** A purchasing firm requires some time to process the order and time is also required by the supplying firm to execute the order. The time taken in processing the order and then executing it is known as lead time It is essential to maintain some inventory during this period.
- **Rate of Consumption :** It is the average consumption of materials in the factory. The rate of consumption will be decided on the basis of past experience and production plans.
- **Nature of Material :** The nature of material also affects the minimum level. If a material is required only against special orders of the customer then minimum stock will not be required for such materials. Minimum stock level can be calculated with the help of following formula :

$$\boxed{\text{Minimum stock level} = \text{Re-ordering level} - (\text{Normal consumption} \times \text{Normal Re-order period})}$$

#### (b) Re-ordering Level

When the quantity of materials reaches at a certain figure then fresh order is sent to get materials again. The order is sent before the materials reach minimum stock level. Re-ordering level or ordering level is fixed between minimum level and maximum level. The rate of consumption, number of days required to replenish the stocks, and maximum quantity of materials required on any day are taker, into account while fixing re-ordering level. Re-ordering level is fixed with the following formula :

$$\boxed{\text{Re-ordering Level} = \text{Maximum Consump-tion} \times \text{Maximum Re-order period.}}$$

#### (c) Maximum Level

It is the quantity of materials beyond which a firm should not exceed its stocks If the quantity exceeds maximum level limit then it will be overstocking. A firm should avoid overstocking because it will result in high material costs. Overstocking will mean blocking of more working capital, more space for storing the materials, more wastage of materials and more chances of losses from obsolescence Maximum stock level will depend upon the following factors :

1) The availability of capital for the purchase of materials.
2) The maximum requirements of materials at any point of time.
3) The availability of space for storing the materials.
4) The rate of consumption of materials during lead time.

5) The cost of maintaining the stores.

6) The possibility of fluctuations in prices.

7) The nature of materials. If the materials are perishable in nature, then they cannot be stored for long.

8) Availability of materials. If the materials are available only during seasons then they will have to be stored for the rest of the period.

9) Restrictions imposed by the Government. Sometimes, government fixes the maximum quantity of materials which a concern can store. The limit fixed by the government will become the limiting factor and maximum level cannot be fixed more than this limit.

10) The possibility of change in fashions will also affect the maximum level.

The following formula may be used for calculating maximum stock level :

$$\boxed{\text{Maximum StockLevel} = \text{Re-orderingLevel} + \text{Re-ordering Quantity - (Minimum Consumption} \times \text{Minimum Re-ordering period)}}$$

**(d) Danger Level**

It is the level beyond which materials should not fall in any case. If danger level arises then immediate steps should be taken to replenish the stocks even if more cost is incurred in arranging the materials. If materials are not arranged immediately there is a possibility of stoppage of work. Danger level is determined with the following formula:

$$\boxed{\text{Danger Level} = \text{AverageConsumption} \times \text{Maximum re-order period for emergency purchases.}}$$

**(e) Average Stock Level.** The average stock level is calculated as such :

$$\boxed{\text{Average Stock Level} = \frac{\text{Minimum Stock Level} + \text{Maximum Stock Level}}{2}}$$

**2. Economic Order Quantity (EOQ)**

A decision about how much to order has great significance in inventory management. The quantity to be purchased should neither be small nor big because costs of buying and carrying materials are very high. Economic order quantity is the size of the lot to be purchased which is economically viable.

This is the quantity of materials which can be purchased at minimum costs. Generally, EOQ is the point at which inventory carrying costs are equal to order costs. In determining economic order quantity it is assumed that cost of managing inventory is made up solely of two parts i.e. ordering costs and carrying costs.

**(i) Ordering Costs**

These are the costs which are associated with the purchasing or ordering of materials. These costs are also known as buying costs and will arise only when some purchases are made.

These costs will include costs of selling up machinery for manufacturing materials, time taken up in setting, cost of tools etc.

**(ii) Carrying Costs**

These are the costs for holding inventories. These costs will not be incurred if inventories are not carried. The Planning Commission of India has estimated these costs between 15 percent to 20 percent of total costs. The longer the materials kept in stocks, the costlier it becomes by 20 percent every year.

The ordering and carrying costs have a reverse relationship. The ordering cost goes up with the increase in number of orders placed. On the other hand, carrying costs go down per unit with the increase in number of units, purchased and stored.

**Assumptions of EOQ**

While calculating EOQ the following assumptions are made.

i) The supply of goods is satisfactory. The goods can be purchased whenever these are needed.

ii) The quantity to be purchased by the concern is certain.

iii) The prices of goods are stable. It results to stabilize carrying costs.

The EOQ can be calculated by using the following formula

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

Where

A = Annual consumption in rupees.

O = Cost of placing an order

C = Inventory carrying costs of one unit.

### 3. A-B-C Analysis

The materials are divided into a number of categories for adopting a selective approach for material control. It is generally seen that in manufacturing concern, a small percentage of items contribute a large percentage of value of consumption and a large percentage of items of materials contribute a small percentage of value. In between these two limits there are some items which have almost equal percentage of value of materials.

Under A-B-C analysis, the materials are divided into three categories ***viz.,*** A, B and C. Past experience has shown that almost 10 per cent of the items contribute to 70 per cent of value of consumption and this category is called 'A' Category. About 20 per cent of the items contribute about 20 per cent of value of consumption and this is known as category 'B' materials. Category 'C' covers about 70 per cent of items of materials which contribute only 10 per cent of value of consumption. There may be some variation in different organisations and an adjustment can be made in these percentages.

### 4. VED Analysis

The VED analysis is used generally for spare parts. The requirements and urgency of spare parts is different from that of materials. A-B-C anaysis may not be properly used for spare parts. The demand for spares depends upon the performance of the plant and machinery. Spare parts are classified as Vital (V), Essential (E) and Desirable (D).

The vital spares are a must for running the concern smoothly and these must be stored adequately. The non-availability of vital spares will cause havoc in the concern. The E type of spares are also necessary but their stocks may be kept at low figures. The stocking of D type of spares may be avoided at times. If the lead time of these spares is less, then stocking of these spares can be avoided.

The classification of spares under three categories is an important decision. A wrong classification of any spare will create difficulties for production department. The classification of spares should be left to the technical staff because they know the need, urgency and use of these spares.

### 5. Just In Time (JIT) Inventory Control System

Just in time philosophy, which aims at eliminating waste from every aspect of manufacturing and its related activities, was first developed in Japan. Toyota introduced this technique in 1950's in Japan, however, U.S. companies started using this technique in 1980's. The term JIT refers to a management tool that helps to produce only the needed quantities at the needed time.

According to the official terminology of C.I.M.A., JIT, is "a technique for the organisation of workflows, to allow rapid, high quality, flexible production whilst minimizing manufacturing work and stock level." There are broadly two aspects of JIT (i) just in time production, and (ii) just in time purchasing. Schonberger defines, JIT as, "to produce and deliver finished goods just in time to be sold, sub-assembles just in time to be assembled into finished goods, fabricates parts just in time to go into sub-assembles and purchased materials just in time to be transformed into fabricated parts.

Just in time inventory control system involves the purchase of materials in such a way that delivery of purchased material is assured just before their use or demand. The philosophy of JIT control system implies that the firm should maintain a minimum (zero level) of inventory and rely on suppliers to provide materials just in time to meet the requirements. The traditional inventory control system, on the other hand, requires maintaining a healthy level of safety stock to provide protection against uncertainties of production and supplies.

**Objectives of JIT**

The ultimate goal of JIT is to reduce wastage and enhance productivity. The important objectives of JIT include :

i) Minimum/zero inventory and its associated costs.

ii) Elimination of non-value added activities and all wastes.

iii) Minimum batch/lot size.

iv) Zero breakdowns and continuous flow of production.

v) Ensure timely delivery schedules both inside and outside the firm.

vi) Manufacturing the right product at right time.

**Features of JIT**

The main features of JIT inventory control system are as follows :

a) It emphasises that firms following traditional inventory control system overestimate ordering cost and underestimate carrying costs associated with holding of inventories.

b) It advocates maintaining good relations with suppliers so as to enable purchases of right quantity of materials at right time.

c) It involves frequent production/order runs because of smaller batch/lot sizes.

d) It requires reduction in set up time as well as processing time.

e) The major focus of JIT approach is to purchase or produce in response to need rather than as per the plans and forecasts.

**Advantages of JIT Inventory Control System**

The following are the major advantages of just in time inventory control system :

i) The right quantities of materials are purchased or produced at the right time.

ii) Investment in inventory is reduced.

iii) Wastes are eliminated.

iv) Carrying or holding cost of inventory is also reduced because of reduced inventory.

v) Reduction in costs of quality such as inspection, costs of delayed delivery, early delivery, processing documents etc. resulting into overall reduction in cost.

**Q31. What are the limitations of ABC Analysis ?**

*Ans :* **(Dec.-19)**

(i) ABC analysis will not be effective if the material are not classified into the groups properly.

(ii) It is not suitable for the organization where the costs of materials do not very significantly.

(iii) There is no any scientific base for the classification of material under ABC analysis.

(iv) The classification of the materials into different groups may lead to extra cost. Hence, it may not be suitable for small organization.

### 5.5.2 Inventory Control Systems

**Q32. Explain briefly about various inventory control system.**

*Ans :*

The different inventory control systems are as follows,

### 1. P-System

P-system is an inventory control method. P-system is known by different names such as, periodic review system, fixed-order period system, periodic system or fixed order interval system. In this system, the orders are placed at fixed period, but the order quantity varies from order to order depending upon the demand in the market. In the Q-system, the order quantity remains same but the period of order differs and in P-system, the order quantity differs but period of order remains the same. In the fixed order period system, the stock position of each type of item is checked at regular intervals. The frequency of reviews differs from firm to firm and from one type of material to other type of material of the same firm.

The figure given below depicts the fixed order period system or P-system.

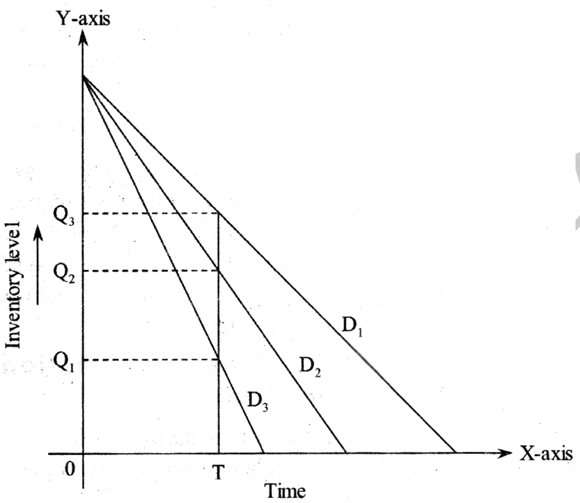



**Fig.: Fixed Order Period System or P-system**

From the above figure, it is clear that order period is fixed at point 'T' and the order quantity changes from $Q_1$ to $Q_2$, to $Q_3$, $Q_1$, $Q_2$ and $Q_3$ represents quantity ordered at different demand conditions (i.e., $D_1$ $D_2$ and $D_3$).

### 2. Q-system/Two-bin System

Q-System is also known as 'fixed order quantity system'. In the fixed order quantity system, a fixed quantity of material is ordered whenever the stock in the warehouse attains the reorder level. The fixed order quantity in Q-system is regarded as Economic Order Quantity (EOQ). Even though the order quantity remains constant, the order period changes with the changes in the demand of the consumers.

The figure given below depicts the fixed order period system.

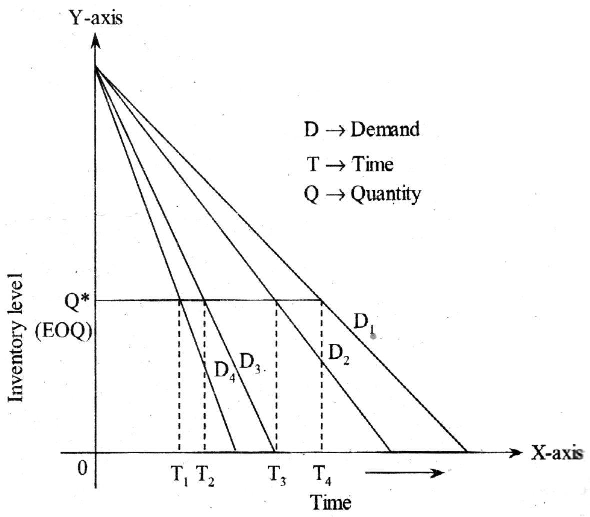



**Fig. : Q-system / Fixed Order Quantity System**

From the above figure, it is clear that the quantity ordered remains constant and the time of order placement varies depending upon the demand in the market. $D_1$, $D_2$, $D_3$ and $D_4$ represents demand due to which the order period changes.

Q-system is also called as 'two-bin system'. Two-bin system is a traditional inventory control system in which the identical inventory items are divided into two bins. Initially, the stock is issued from the first bin and after issuing all the stock from the first bin, an order is placed for the stock to fill the first bin. Till the ordered stock is received, the stock from the second bin is used.

## 5.5.3 Analysis of Investment in Inventory

**Q33. Discuss in detail incremental analysis of investment in inventory.**

*Ans :*

**Analysis of Investment in Inventory**

The financial manager is held with an important responsibility to look after the inventory management, because inventories involves large quantity of funds in the firms investment. An investment decision is a decision which is made to determine or change the level of inventory. Hence, it involves a profitability evaluation of investment in inventory. The objective of inventory policy is to maximize the value of firm at a point where both marginal or incremental return from the investment in inventory and the marginal cost or incremental cost of funds used to finance the investment in inventory are equal.

### Incremental Analysis

Similar to the investment in receivables, the investment in inventory must be evaluated from the following four steps,

(i) Estimation of incremental operating profit.

(ii) Estimation of incremental investment in inventory.

(iii) Estimation of return on investments.

(iv) Comparison of rate of return on investment with the cost of funds.

The incremental analysis is used to determine the values of operating profit, investment in inventory, rate of return on investment and cost of funds. If the incremental rate of return is more than the required rate of return, then the change in inventory policy is acceptable.

### Step-1: Estimation of incremental Operating Profit

Estimation of incremental operating profit (AOP) is the first step in determining the rate of return (r). If there is an absence of information for computating rate of return r, then the firm can assume that there will be no increase in cost of goods sold in terms of variable cost and other costs with the increase in sales. The formula for determining operating profit is,

$$\boxed{\Delta\text{ OP} = \Delta\text{ CONT} - \Delta\text{ COST}}$$

Where,

OP = Operating Profit

CONT = Contribution

COST = Carrying Cost

$\Delta$ = Change or increase in variable.

### Step-2: Estimation of Incremental Investment in Inventory

Estimation of Incremental Investment in Inventory ($\Delta$INV) is the second step in the analysis, wherein it is required to change from one inventory policy to other. Generally, the investment in inventory must be determined in terms of out-of pocket costs. If should be noted that to increase sales occurring from higher inventors, the organization will also requires investment in other current assets which will be partly financed by current liabilities. Hence, the formula for incremental investment is given as,

$$\boxed{\Delta\text{ INVST} = \Delta\text{ INV} + \Delta\text{ NWC}}$$

Where,

INVST = Incremental Investment

INV = Increased Finished Goods Inventories

NWC = Net Working Capital

$\Delta$ = Change or Increase in Variable.

### Step-3: Estimation of Return on Investment

After calculating the incremental operating profit and incremental investment, then both can be related to calculate rate of return on investment. The formula is,

$$\boxed{r = \frac{\Delta\text{ OP}}{\Delta\text{ INVST}}}$$

### Step-4: Comparison of the Rate of Return on Investment with the Cost of Funds

The selection of inventory policy by the management depends on the required rate of return on incremental or marginal investment in inventories. In this stage, the organization should focus on the required rate of return as is not a borrowing rate. It is based on the risk of investment, higher risk will give higher required rate of return.

Hence, the selection of inventory policy is based on the comparison made between expected rate of return and required rate of return. So, the organization should invest in higher level of inventory, where $r \geq k$.

## PROBLEMS ON INVENTORY MANAGEMENT

**8. The finance department of a corporation provides the following information (i) The carrying cost per unit of inventory is Rs.10, (ii) cost per order is Rs.20. (iii) No. of units required is 30,000 units.**

**Determine EOQ, total number of order to be place in year and time gap between 2 order.**

*Sol :*

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

A = 30,000 units

O = 20 Rs. per order

C = 10 Rs.

1. $EOQ = \sqrt{\frac{2 \times 30,000 \times 20}{10}} = 346$

2. Total number of order $= \frac{A}{EOQ} = \frac{30,000}{346} = 86.7 = 87$ orders

3. Time gap between 2 consequitive order $= \frac{\text{No. of year}}{\text{No. of orders}} = \frac{12}{87} = 0.13.$

---

**9. From the following information, calculate minimum stock level, maximum stock level and reordering level :**

| | | |
|---|---|---|
| **i)** | **Maximum Consumption** | **200 units per day** |
| **ii)** | **Minimum Consumption** | **150 units per day** |
| **iii)** | **Normal Consumption** | **160 unit per day** |
| **iv)** | **Re-order period** | **10 –– 15 days** |
| **v)** | **Re-order quantity** | **1,600 units.** |
| **vi)** | **Normal re-order period** | **12 days** |

*Sol :*

**(i) Re–orderning level** = Maximum Consumption × Maximum Re-order Period

200 × 15 = 300 units

**(ii) Minimum Stock level** = Re–ordering level–(Normal Consumption × Normal Re-ordering Period)

= 3,000–(160 × 12) = 3000 – 1920 = 1,080 units.

**(iii) Maximum stock level** = Re-ordering Level + Re-order Quantity – (Minimum Consumption × Minimum Re-order Period)

= 3,000 + 1,600 – (150 × 10)

= 3,000 + 1,600 – 1,500 = 4600 – 1500 = 3100 units

**10. From the following information, find out economic order quantity.**

**Annual Usage, 10,000 units**

**Cost of placing and receiving one order Rs. 50.**

**Cost of materials per unit Rs. 25**

**Annual Carrying cost of one unit : 10% of inventory value.**

*Sol :*

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

Where, A = Annual consumption in units

C = Cost of placing an order

C = Inventory carrying cost of one unit

$$\text{EOQ} = \sqrt{\frac{2\times 10,000\times 50}{2.5}} \left[\text{as } I = \frac{25\times 10}{100} = 2.5\right]$$

$$= \sqrt{4,00,000} = 632 \text{ units.}$$

---

**11. The annual demand for a product is 6,400 units. The unit cost is Rs. 6 and inventory carrying cost per unit per annum is 25% of the average inventory cost. If the cost of procurement is Rs. 75, determine :**

**a) Economic order quantity (EOQ)**

**b) number of orders per annum ; and**

**c) time between two consecutive orders.**

*Sol :*

**(a) Economic order quantity(EOQ)**

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

Where, A = Annual consumption in units = 6,400 units

S = Cost of placing an order = Rs. 75

I = Inventory carrying cost of one unit

$$= 6\times\frac{25}{100} = Rs.1.50$$

$$\text{EOQ} = \sqrt{\frac{2\times 6400\times 75}{1.50}} = \sqrt{\frac{9,60,000}{1.50}}$$

$$= \sqrt{6,40,000} = 800 \text{ units}$$

**(b) Number of orders per annum**

$$= \frac{6,400}{800} = 8 \text{ orders}$$

**(c) Time between two consecutive orders**

$$= \frac{12 \text{ months}}{8 \text{ orders}}$$

= 1.5 months

**12. A manufacturing firm using 12 different types materials has given the following data,**

| Item | Units | Unit cost (Rs.) | Item | Unit | Unit cost (Rs.) |
|---|---|---|---|---|---|
| A | 3,000 | 80 | G | 14,600 | 13.50 |
| B | 32,000 | 1 | H | 7,800 | 8 |
| C | 9,000 | 42 | I | 11,200 | 6.50 |
| D | 1,600 | 120 | J | 48,000 | 3 |
| E | 28,000 | 4 | K | 15,600 | 7.50 |
| F | 11,500 | 10 | L | 13,300 | 11.50 |

**You are required to present an ABC plan and depict the same graphically.**

*Sol :*

**Step 1**

Determination of Annual Consumption Value

| Item | [Annual consumption (Units × Unit Price)] | Annual consumption Value (ACV) |
|---|---|---|
| A | 3000 × 80 | 32,000 |
| B | 32,000 × 1 | 32,200 |
| C | 9,000 × 42 | 3,78,000 |
| D | 1,600 × 120 | 1,92,000 |
| E | 28,000 × 4 | 1,12,000 |
| F | 11,500 × 10 | 1,15,000 |
| G | 14,600 × 13.50 | 1,97,100 |
| H | 7,800 × 8 | 62,400 |
| I | 11,200 × 6.50 | 72,800 |
| J | 48,000 × 3 | 1,44,000 |
| K | 15,600 × 7.50 | 1,17,000 |
| L | 13,300 × 11.50 | 1,52,950 |
| | | 18,15,250 |

### Step 2

Rearrange the items in the descending order of annual consumption value and calculating the cumulative (ACV).

| Item | Units | % of Cumulative total | Unit cost | Total | % of Cumulative total |
|---|---|---|---|---|---|
| C | 9,000 | 4.6 | 42 | 3,78,000 | 20.8 |
| A | 3,000 | 1.5 | 80 | 2,40,000 | 13.2 |
| G | 14,600 | 7.5 } 21.1 | 13.50 | 1,97,100 | 10.8 } 71.6 |
| D | 1,600 | 0.8 | 120 | 1,92,000 | 10.5 |
| L | 13,300 | 6.7 | 11.50 | 1,52,950 | 8.4 |
| J | 48,000 | 24.5 | 3 | 1,44,000 | 7.9 |
| K | 15,600 | 7.9 } 59.3 | 7.50 | 1,17,000 | 6.4 |
| F | 11,500 | 5.8 | 10 | 1,15,000 | 6.3 } 90.4 |
| E | 28,000 | 14.3 | 4 | 1,12,000 | 6.1 |
| I | 11,200 | 5.7 } 100 | 6.50 | 72,800 | 4.0 |
| H | 7,800 | 3.9 | 8 | 62,400 | 3.4 } 100 |
| B | 32,000 | 16.3 | 1 | 32,000 | 1.7 |
| | **1,95,600** | | | **18,15,250** | |

**Step 3 :** Construction of ABC Graph.

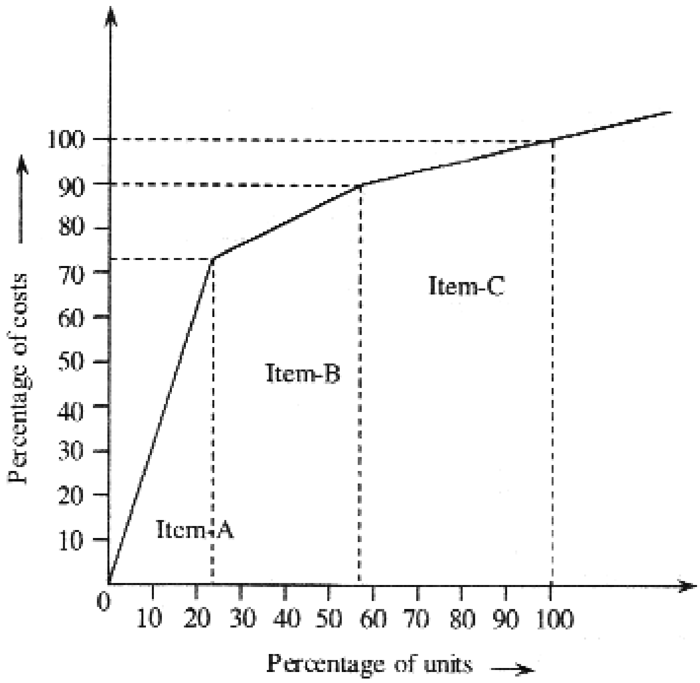



**Fig.: Graphical Representation of ABC Analysis**

In the tabular and graphical representation, it is clear that Item-A occupies 21.1% of total units and represents cost of 71.6% and Item-B occupies 59.3% of total units and represents 90.7% of cost. Finally Item-C occupies 40.2% of total units and 9.1% of total cost.

## 5.6 Corporate Restructuring

**Q34. Define corporate restructuring. Explain different types of corporate re-structuring.**

*Ans :*

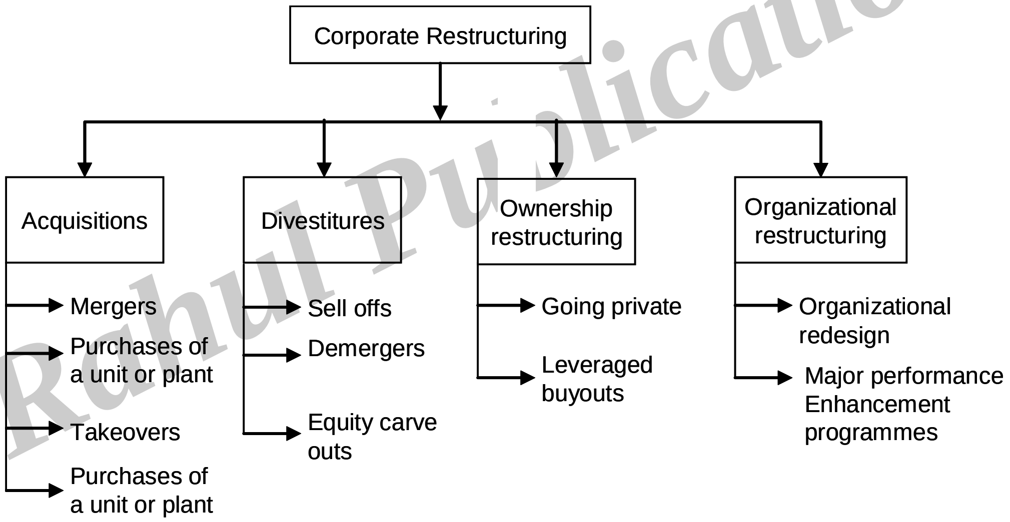
**Introduction**

Corporate Restructuring refers to the changes in ownership, business mix, assets mix and alliances with a view to enhance the shareholder value. Hence, corporate restructuring may involve ownership restructuring, business restructuring and assets restructuring.

A company may affect ownership restructuring through mergers and acquisitions, leveraged buy-outs, buyback of shares, spin-offs, joint ventures and strategic alliance. Business restructuring involves the reorganization of business units or divisions. It includes diversification into new businesses, out-sourcing, divestments, brand acquisitions etc.

Asset restructuring involves the acquisition or sale of assets and their ownership structure. The examples of asset restructuring are sale and leaseback of assets, securitization of debt, receivable factoring etc.

**Types of Corporate Restructures**






The basic purpose of corporate restructuring is to enhance the shareholder value. A company should continuously evaluate its portfolio of businesses, capital mix and ownership and assets arrangements to find opportunities for increasing the shareholder value. It should focus on assets utilization and profitable investment opportunities and reorganize or divest less profitable or loss making businesses / products. The company can also enhance value through capital restructuring; it can design innovative securities that help to reduce cost of capital.

Corporate restructuring can be done in different forms. Some of them are explained below,

1. **Acquisitions**

   In this type of corporate restructuring, one company imposes control over assets or management of another company without any involvement of any other business or companies. When a company acquires a substantial quantity of shares or voting rights of target company, it is known as substantial acquisition.

**(a) Merger :** Merger refers to a combination of two or more companies in one company. In merger, all assets and liabilities of merging companies are combined. Merger takes place in two forms,

(i) Merging of one or more companies with an existing company

or

(ii) Two or more companies merge to form a new company.

**(b) Purchase of a Division/Plant :** As corporate restructuring is developing, purchase and sale of divisions or plants is becoming common in present conditions. A company can purchase an asset or it can divestiture its asset depending on the need. Some important examples of purchase of division/plant in recent past years are,

(i) Cement plant of TISCO is purchased by Lafarge.

(ii) SRF limited become the owner of nylon tyre cord division of CEAT.

(iii) Heinz India Limited purchased the foods division of Glaxo India Limited.

**(c) Takeover :** Takeover occurs when an acquiring firm acquires specific part of equity capital of target company through which acquiring company can exercise control over the functions of the company. Takeover can occur in following ways,

- Open market purchase
- Negotiated acquisition
- Preferential allotment

**(d) Business Alliance :** Business alliances have developed considerably. Some of them are joint ventures, licensing, strategic alliances etc. When a business alliance is well planned it is considered as an achievable alternative to mergers and acquisitions. Business alliance has become common in many fields such as automobiles, oil exploration, media and entertainment, high technology, pharmaceuticals and financial services.

### 2. Divestiture

Every firm tries to expand its business in one or the other way to increase its value in the economy. When assets of the firm are sold, it is called divestiture. Divestiture takes place in order to create cash for expansion, to develop smooth running organization with no drawbacks and to restructure its corporation.

Divestiture can be explained through following methods,

**(a) Sell-off :** When a firm sells its business unit or plant, it is known as partial sell off. Partial sell-off can also be termed as slump sale. It is a contraction for seller as a part of his business is sold-off, whereas it acts as an expansion for buyer because it is an addition to his business. Sell off decisions are taken with the aim of increasing capital, reducing losses, strategic realignment and efficiency gain.

**(b) Demergers :** A demerger takes place when a company transfers a part of its business to another company. The company which is transferring its business is known as a demerged company and the company to which it has transferred is known as resulting company. Demerger can take place in the form of either spin-off or split-up.

**(c) Equity Carveout :** Under equity carveout, a parent company sells a part of equity of its subsidiary to general or to a strategic investor. Equity carveouts generally take place to generate cash and to introduce a strategic investor in a subsidiary.

### 3. Ownership Restructuring

In order to make changes in the ownership pattern of the company, corporate restructuring is done. Ownership restructuring is done in two ways,

(i) Going private and

(ii) Leveraged buyouts.

**(i) Going Private :** Privatization of company, whose shares were in hands of public, is known as 'going private'. A company is privatized by purchasing back the shares that were held by the public.

**Ex:** Philips India, Castrol India etc.

**(ii) Leveraged Buy Out :** When ownership is transferred it is mainly financed with debt, such transaction is known as leveraged buy out. Sometimes, whole company is brought out but mostly, a business unit is involved in leverage buy out. Usually, a business unit is purchased by its management, then it is known as "Management Buy Out" (MBO). When management acquire the company or its business unit, then it purely becomes a private company.

**4. Organizational Restructuring**

In order to face the competition many companies are going for organizational restructuring. The essential components of organizational restructuring and performance enhancement programmes are as follows, regrouping of business, decentralization, downsizing, outsourcing, business process reengineering, enterprise resource planning and total quality management.

## 5.6.1 Corporate Mergers

### 5.6.1.1 Types of Mergers

**Q35. Define Mergers. Explain different types of mergers.**

*Ans :* **(Dec.-18)**

A merger is said to occur when two or more companies combine into one company. One or more companies may merge with an existing company or they may merge to form a new company. In merger, there is complete amalgamation of the assets and liabilities as well as shareholders' interests and business of the merging companies. There is another mode of merger called amalgamation. In this, one company may purchase another company without giving proportionate ownership to the shareholders' of the acquired company or without continuing the business of the acquired company.

**Types of Merger**

There are three major types of mergers :

**(a) Horizontal Mergers**

This is a combination of two or more firms in similar type of production, distribution or area of business. Example can be combining of two book publishers or two luggage manufacturing companies to gain dominant market share.

**(b) Vertical Merger**

This is a combination of two or more firms involved in different stages of production or distribution. For example, joining of a TV manufacturing company and a TV marketing company or the joining of a spinning company and a weaving company. Vertical merger may take the form of forward or backward merger. When a company combines with the supplier of material, it is called backward merger and when it combines with the customer, it is called forward merger.

**(c) Conglomerate Merger**

This is a combination of firms engaged in unrelated lines of business activity. A typical example is merging of different business like manufacturing of cement products, fertilizers products, electronic products, insurance investment and advertising agencies. Voltas Ltd. is an example of a conglomerate company.

**Q36. Discuss the process of merger.**

*Ans :*

When a firm is interested in merging or amalgamating with another firm, it must follow some legal aspects before merging. The process of merger involves following steps,

1. **Evaluation of Proposal by the Companies**

   When an idea for merger comes in mind, the management of interested firms evaluate the benefits and drawbacks of the plan, reactions of shareholders and other members and implication of tax is also assessed. If it is advantageous for concerned parties, then only it is proceeded.

2. **Deciding the Exchange Ratios**

   At the time of merger, some shares are given to the shareholders of target company. So, it is necessary to decide a reasonable exchange ratio. Usually, some elements are used to identify the exchange ratio such as market value per share, potential earnings, book value per share etc.

3. **Acceptance of Board of Directors**

   After analyzing the merger plan completely and deciding the exchange ratios, scheme of merger is passed on to the specific board of directors for their acceptance.

4. **Acceptance of Shareholders**

   When scheme of merger is accepted by board of directors, it is placed in front of shareholders. According to Sec. 3 91 of Indian Companies Act, plan for merger must he accepted in meeting of members with not less than 3 4 of majority of both the companies. If merger involves exchange of shares, it must be approved by 90 percent of shareholders of target company.

5. **Consideration of Interests of the Creditors**

   It is also included in Sec. 391, that plan must be accepted by majority of creditors in numbers and 3/4 m value. Hence, interests of creditors are also taken into consideration in the scheme of merger.

6. **Acceptance of the Court**

   An application needs to be filed in court after its approval from all parties for its sanction. Before giving any judgement, the court will consider the perspective of all members. In order to protect the interest of related parties, the court may accept, alter or reject the merger plan.

7. **Acceptance of Reserve Bank of India**

   According to Sec. 19(1 )(d) of the Foreign Exchange Regulation Act, 1973, it is necessary to get the permission of RBI for issuing any security to a person, who is living abroad. Therefore, in merger RBI guidelines have to be followed by the acquiring company to issue its shares in exchange. Sec. 29 regulates the acquisition of any Indian company in which share of nonresident is more.

### 5.6.1.2 Economic rationale of Mergers

**Q37. Explain about economical rational for mergers.**

*Ans :*

**Economics of Mergers**

The economic advantages of a merger are

a. Economic of scale

b. Synergy

c. Fast growth

d. Tax benefits

e. Diversification

**(a) Economic of scale**

The operating cost advantage in terms of economics of scale is considered to be primary motive for mergers in particular for horizontal and vertical mergers. They result to lower average cost of production and sales due to a higher level of operation.

For instance, overhead costs can be substantially reduced on account of sharing central services such as accounting and finance, office, executive and top level management, legal, sales promotion and advertisement and so on.

**(b) Synergy**

Synergy results from complementary activities. For instance, one firm may have a substantial amount of financial resources while the other has profitable investment opportunities. One firm may have a strong research and development team whereas the other may have a very efficiently organized production department. Similarly, one firm my have well established brands of its products but lacks marketing organization and another firm may have a very strong marketing organizations. The merged business unit in all these cases will be more efficient than the individual firms.

**(c) Fast growth**

A merger often enables the amalgamating firm to grow at a rate faster than is possible under the internal expansion route via. its own capital budgeting proposals, because the acquiring company enters a new market quickly, avoiding the delay associate with building a new plant and establishing a new line of products.

Internal growth is time consuming, requiring research and development, organization of the product, market penetration and in general a smoothly working organizations. There may sometimes be an added problem of raising adequate funds to execute the required capital budgeting projects. A merger obviates all these obstacles and thus, steps up the pace of corporate growth.

**(d) Tax benefits**

Under certain conditions, tax benefits may turn out to be underlying motive for a merger. These conditions relate to the tax laws allowing set off and carry forward of lossed. It may be beneficial to merge a firm saddled with large tax carry forward losses with a firm having sufficient current earnings. The argument is that this tax loss carry forward will reduce the taxable income of the newly merged firm, with its obvious impact on the reduction of tax liability. The merged firm is taxed as if the two firms had always been together. In operational terms, the losses of target firm will be allowed to be set off against the profits of the acquiring firm.

**(e) Diversification**

Diversification is another major advantage in a conglomerate merger. The argument is that a merger between two unrelated firms would tend to reduce business etc. which, in turn, reduces the discount rate/required rate of return of the firm's earnings. And thus increase the market value. Such mergers help stabilize or smoothen overall corporate income, which would otherwise fluctuate due to seasonal or economic cycles.

### 5.6.1.3 Motives for Mergers

**Q38. Discuss the motive for mergers.**

*Ans :*

There are many reasons behind mergers but some of them do not contribute for economic development of the firm. Some reasons which do not create value are, so will be prosecuted.

**(a) Strategic Benefit**

Strategic benefit mainly aims at achieving long term plans and implementing them. When a firm desires to enter or expand in a particular industry, acquisition provides more advantages than internal expansion. Some of them are,

- It prevents competitors and avoids competition.
- It can pass over several stages of expansion in a short span of time.
- It ensure less risk and less cost.
- Merging in a saturated market helps in expansion and replacement which is more suitable than developing a new firm through internal expansion.

**(b) Economies of Scope**

A company can broaden its scope by a particular set of skills or assets which it possesses.

**(c) Economies of Vertical Integration**

Economies of vertical integration can be accomplished when companies engaged in different stages of production merge together. However, vertical integration is not suitable in all situations. If a company performs all functions on its own, then benefit of outsourcing is lost.

**(d) Complementary Resources**

Each firm specializes in certain activities. When firms with complementary resources merge together, they can effectively utilize the resources and produce innovative products.

**(e) Managerial Effectiveness**

In the event of merger, managerial effectiveness also increases. When inefficient managerial team is replaced by an effective managerial team, it leads to the progress of the firm. Another advantage would be in the form of compatibility between the interests of the managers and the shareholders. With the help of merger an effective discipline of management can be maintained.

If poor performance leads to the risk of acquisition of a firm, the managers will struggle and improve their performance.

**(f) Diversification**

The main reason for merger is to reduce risk through diversification. Diversification implies dividing or spreading the business in different product lines. Reduction of risk in the merging concept depends on correlation between the earnings. Correlation explains how the two variables are related or dependent on each other. When there is a negative correlation it implies low risk and positive correlation implies high risk.

**Q39. Explain the impact of mergers on EPS, market price per share and book value per share of the acquiring company.**

*Ans :* **(Feb./March-16)**

When two or more companies are combined then the value of shares of the merged companies are evaluated in terms of exchange ratio. The main objective of any merger is to maximize the c/ners equityin the long run. Therefore, for determining the firm's exchange ratio three different approaches are available. They are,

1. Earnings per share
2. Market value Approach and
3. Book value approach.

**1. Earnings Per Share Approach**

The acquiring firm before any acquisition should considered the impact of merger on the Earnings Per Share (EPS) of the surviving company. The analysis must be made whether such an acquisition is going to have a positive impact on EPS after merger or it will suffer with an effect of diluting the EPS. Thus, merger decision is based on the future EPS or growth in earnings that will affect the firm's share prices which is the prime function of P/E ratio and EPS.

**2. Market Value Approach**

Market value approach is regarded as one of the most widely used approach in determining the value of the firm, especially the large firms. The market price shows the total earnings potential of the company, dividend, capital structure, risks, asset values and other speculative factors. The market value may change due to market sentiments and personal decisions. It also provides a very close approximation of actual/true worth of a firm. The exchange ratio of market price is as follows,

$$\frac{\text{Market Price Share (MPS) of acquired company} \times \text{Number of shares offered}}{\text{Make Price per Share (MPS) of the acquired company}}$$

### 3. Book-Value Approach

Book value approach of a firm is the value of owner's equity which is based on the general balance sheet and not followed any basis for valuation in most of the mergers. This approach actually be based on the historical costs of the assets of the firm which is a serious limitation in determining the true value of a firm. The formula for determining the book value of share is as follows,

$$\boxed{\text{Book value of share} = \frac{\text{Net worth}}{\text{Number of equity shares}}}$$

$$\boxed{\text{Exchange ratio} = \frac{\text{Book value per share of acquired company}}{\text{Book value per share of acquiring company}}}$$

**Q40. Write about Net Assets Method of merger.**

*Ans :* **(July-18)**

Net asset value means the sum of value of assets. The net assets value is calculated by subtracting all liabilities (i.e current and contingent liabilities) and preference shares from all assets (i.e fixed assets, current assets and investments on balance sheet date). Deductions are made for arrears of depreciation, arrears of preference dividend etc. Few alterations or changes may be found in this method and fixed assets are considered at present realizable value (realizable value of investments, real estate), cost of replacement (replacement cost of plant and machinery) or scrap value (scrap value of obsolete machinery). The net asset value calculated is divided by fully diluted equity shares to obtain net assets value per share.

The steps in valuing shares are as follows:

1. Valuation of Assets
2. Determination of liabilities and
3. Fixation of value of various kinds of equity shares.

Formula to calculate net assets value per share is $= \dfrac{\text{Net Assets Value}}{\text{Fully Diluted Equity Shares}}$

## 5.6.1.4 Financial evaluation of Mergers

**Q41. Explain the financial evaluation of mergers.**

*Ans :*

Every merger requires an appropriate financial assessment to identify the returns and cash flows, risk involved, amount to be paid to target company and suitable alternative to finance the merger. The acquiring firm must make an adequate payment to target firm which must be equal or more than the current market value of the share.

When the amount paid to a target firm is more than the market value of the share then it is termed as merger at a premium, usually, it is done when merger benefits the acquiring firm.

### DCF Evaluation of Mergers

In merger, one firm purchases the whole business or a part of the business of other firm not a particular asset. Hence, it is regarded as a unique type of capital budgeting decision. The acquiring firm must evaluate the value of merger by using Discounted Cash Flow (DCF) approach.

DCF approach is an effective method used in evaluating mergers and acquisitions, DCF method requires knowledge about estimated cash flows, timing of cash flows and discount rate. The cash flows can be estimated through returns or earnings. Cash flows involve modifications in depreciation, capital expenditure and working capital. Net Cash Flow (NCF) is calculated as follows,

$$NCF = EBIT\,(1 - T) + DEP - \Delta NWC - \Delta C\,APEX$$

Where,

EBIT = Earnings Before Interest and Tax

T = Tax rate

DEP = Depreciation

$\Delta$NWC = Changes in Net Working Capital

$\Delta$CAPEX = Changes in Capital Expenditure.

Risk involved in cash flows determines the appropriate discount rate as cash flows are estimated on operations of the target firm.

Financial evaluation of a merger must go through the following steps,

- Recognize the progress and profitability involved in each situation
- Calculate the amount of cash flows and their timing.
- Evaluate the cost of capital
- Calculate NPV for each situation
- Determine whether the merger is suitable or not on the basis of NPV
- Specify the way in which the merger must be financed either through cash or exchange of shares
- Estimate the effect of merger on EPS and price earnings ratio.



## 5.7 Acquisitions

**Q42. Define acquistion explain different types of acquistion.**

*Ans :* **(Dec.-18)**

Acquisition is an activity in which one company controls the other company. The company which controls is known as acquiring company and the "other company which is under control is target company. In acquisitions, business is purchased through cash, stock or combination of both.

Acquisitions are something different from mergers. In mergers, CEOs of both the companies agree for combining, whereas in acquisitions, the company which is acquired may not be willing.

Nature of acquisitions is mainly of two types, they are,

i) Friendly and

ii) Hostile.

**Features of Acquisitions**

1. Becoming incharge of documents of the company.
2. Becoming owner of the assets like plant, division or entire company by purchasing.
3. Taking the authority/power of company by purchasing voting shares in large quantity i.e., 51 percent or more.

**Example of Acquisition**

The Walt Disney Company in 1996 made a major acquisition. It purchased Capital Cities/ABC Inc., so that it can expand its control in entertainment industry.

**Types of Acquisitions**

Acquisition is a plan in which one company purchases the power of authority of another firm or purchase it completely with the intention of making it subsidiary. Therefore, here management of the acquired firm must report to the management of acquiring firm.

There are four types of acquisition strategies, they are,

1. Horizontal acquisitions
2. Vertical acquisitions
3. Related acquisitions
4. Cross-border acquisitions.

**1. Horizontal Acquisitions**

When a company acquires another company which is also involved in same industry is known as horizontal acquisition. Firms engaged in horizontal acquisition can increase their market share by utilizing cost- based and revenue-based synergies. Usually, horizontal acquisitions are more effective, when assets of both acquiring company and acquired company are combined.

**2. Vertical Acquisitions**

When a company acquire its supplier of raw material or distributor of final product, it is known as vertical acquisition. Through vertical acquisition, a firm can acquire control over other parts of the value chain. Vertical integration can also take place in business.

**3. Related Acquisitions**

When a company acquires another company from a highly related industry, it is known as related acquisition. There are many complications in valuing a related acquisition because synergies cannot be achieved easily. Firms which engage in related acquisition to develop and increase their market share must identify each and e very political aspect in general, so that acquisition strategy can be utilized.

**4. Cross-border Acquisitions**

When acquisition made between head quarters of different companies situated in different countries, it is known as cross-border acquisition. The main purpose of cross-border acquisition is to remove entry barriers but it is difficult to arrange and manage, due to the differences in foreign cultures.

## 5.8 Takeovers

**Q43. What are the mean by takeovers. State the various guidelines for takeovers.**

*Ans :* **(Dec.-18)**

The Companies Act, 1956 restricts an individual or a group of people or a company in acquiring shares in public limited company to 25 percent of the total paid up capital. The control group needs to be informed whenever such holding exceeds 10 percent. Whenever the company, or group of individuals or individuals acquires the share another company in excess of the limits should take the approval of the shareholders and the Government.

In case of a hostile takeover bid companies have been given power to refuse to register the transfer of shares and the company should inform the transferee and transfer within 60 days. Hostile takeover is said to have taken place in case if

(a) Legal requirements relating to the transfer of share have not been complied with or

(b) The transfer in contravention of law or

(c) The transfer in prohibited by Court order

(d) The transfer is not in the interests of the company and the public protection of minority shareholders interests.

The interest of all the shareholders should be protected by offering the same high price that is offered to the large shareholders. Financial Institutions, banks and few individuals my get most of the benefits because of their accessibility to the process of the takeover deal market. It may be too late for the small investor before he comes to know about the details of the proposal. The Companies Act provides that a purchaser can force the minority shareholders to sell their shares if -

(i) The offer has been made to the shareholders of the company

(ii) The offer has been approved by at least 90 percent of the shareholders when transfer is involved within four months of making the offer.

**Guidelines for Takeovers**

**(a) Notification to the Stock Exchange**

If an individual or a company acquires 5 percent or more of the voting capital of a company the stock exchange shall be notified within 2 days of such acquisition.

**(b) Limit of Share Acquisition**

An individual or a company which continues acquiring the shares of another company without any offer to share holders until the individual or the company acquires 10 percent of the voting capital.

**(c) Public Offer**

If this limit is exceeded a public offer to purchase a minimum of 20 percent of the shares shall be made to the remaining shareholders.

**(d) Offer Price**

The offer price should not be less than the highest price paid in the past 6 months or the negotiated price.

**(e) Disclosure**

The offer should disclose the detailed terms of offer in details of existing holding.

**(f) Offer Document**

The offer document should contain the offer and financial information. The Companies Act guidelines for takeover are to ensure full disclosure about the merger and takeover and to protect the interests of the shareholders.

**Q44. Explain briefly about takeover and anti takeover strategies.**

*Ans :*

**(A) Takeover Strategies**

Following are the strategies adopted by acquiring firm in order to takeover the target firm.

**1. Tender Offer**

In this strategy, firm provides an open offer to all shareholders so that they can buy their stakes. This must be done only after the bidder selects his equity share.

**2. Bear Hug**

In this strategy, the acquirer frightens the management of target firm to make an open offer. The board gives up and accepts to settle with acquirer for change of control.

**3. Strategic Alliance**

In this strategy, the acquirer wins over the target firm by offering a partnership-deal rather than a buyout. The acquirer declares the control and acquires the target company.

**4. Brand Power**

In this strategy, acquirer makes relation with powerful brands so that it can replace the partner's brands and ultimately buyout the declining company.

**5. Street Sweep**

In this strategy, before making an open offer the acquirer must gather large amounts of stock in a company.

**(B) Anti-takeover Strategies**

Anti-takeover strategies are adopted by target companies in order to repel against offerer. Anti-takeover strategies are available in a wide range and are classified into two types, i.e., pre-offer strategies and post-offer strategies. They are, Pre-offer Strategies

Pre-offer strategies are those which are adopted before an offer of merger or takeover takes place in order to avoid it. Some of them are,

1. **Staggered Board**

   The board of company consists of 3 equal groups of directors. Every year one group is selected from 3 to take managerial decisions.

2. **Super Majority Clause**

   In order to give approval to merger or takeover, organization requires a high percentage of votes. Approximately 80% votes are required.

3. **Poison Pills**

   The existing shareholders are given privilege to buy preference stock or bonds on suitable terms which will be converted into stock of the acquiring firm when merger takes place.

4. **Golden Parachute**

   Management in power is eligible to get exceptional compensation when takeover occurs in organization.

5. **Post-offer Strategies**

   Post offer strategies are those strategies adopted by target company after an offer is made. Some of them are,

6. **Greenmail**

   In order to abstain hostile takeover, target company purchases the shares owned by the bidder at a premium.

7. **Pacman Defence**

   The target company bid for the stock in response to bidder.

8. **Litigation**

   A case can be filed by the target company against the bidder for violating antitrust or securities laws.

9. **Asset Restructuring**

   The target company creates antitrust problems for the bidder by selling essential assets and purchasing unnecessary assets.

10. **Liability Restructuring**

    The target company pays considerable premium on its own shares and repurchases those shares or issues them to any third party which is favourable.

**Q45. What is purchase consideration ? Also discuss about Net Purchase Method.**

*Ans :* **(July-18)**

**Purchase Consideration**

Purchase consideration refers to the agreed amount or price paid by the purchasing company to the partnership firm. The purchasing company may consider to pay the purchase consideration in form of cash, shares and debentures. They may have several options for taking over the business of partnership firm, such as,

(i) Complete business of partnership firm

(ii) Only or all assets of partnership firm

(iii) Few liabilities or few assets

(iv) All liabilities of partnership firm.

**Net Payment Method**

Net payment method is the most suitable method for calculating purchase consideration. Under this method, the purchase consideration is calculated on the basis of payment made to the shareholders of transferor company. It ignores all those payments which were made for discharge of liabilities or for the purpose of winding up. All agreed payments which were specified in agreement should be added to ascertain purchase consideration. Following are some of the factors which should be taken into account while ascertaining purchase consideration,

1. Consideration must include only agreed amount which is mentioned in the agreement.

2. Payments which are made to debenture holders and creditors are not included in purchase consideration.

3. Liquidation expenses of transferor company are borne by transferee company. Treatment of liquidation expenses is done in different ways by different accountants. Some accountants include and some exclude it from purchase consideration.

4. Shares which are issued by the transferee company must be valued at market price when company adopts "purchase method" and valued at par value if the "pooling of interests" method is adopted.

**Q46. Differences between mergers and acquisitions.**

**(OR)**

**Differentiate between mergers and acquisitions.**

*Ans :* **(July-18)**

| S.No. | Merger | S.No. | Acquisition |
|---|---|---|---|
| 1. | Merger is an integration of two or more companies but only one company continues its business. | 1. | Acquisition is an activity in which one company controls the other company. |
| 2. | In mergers, the CEO's of both the companies agrees for combining their business. | 2. | In acquisitions, the company which is acquired may not be willing to combine. |
| 3. | Mergers are financed by stock swap. | 3. | Acquisitions are financed by cash and debt combination. |
| 4. | Horizontal, vertical, conglomerate and congeneric are the different types of mergers. | 4. | Horizontal, vertical, related and cross-border mergers acquisitions are the different types of acquisitions |
| 5.. | Merger is a narrow, technical term of specific legal procedure which may or may not follow | 5. | Acquisition is a generic term used to explain a transfer of ownership, acquisition. |
| 6. | In mergers, one company purchases the stock of company and second company closes down quantity i.e., 51 percent. | 6. | In acquisitions, one company controls the other company by purchasing voting shares in large its business. |
| 7. | **Example:** ITC Kakatiya and Sherton merged into a single entity. | 7. | **Example:** Walt Disney company acquired capital cities/ABC Inc. |

## PROBLEMS ON MERGERS

**13. Jay Manufacturing Company is going to acquire OM Distributors. The shareholders of OM Distributors will get 0.9 shares of Jay manufacturing company for each share held by them. The merger is not expected to yield in economies of scale and operating synergy. The relevant data for the two companies are as follows,**

| Particulars | Jay | OM |
|---|---|---|
| Net sales (Rs. in lakhs) | 600 | 500 |
| Profit after tax (Rs. in lakhs) | 60 | 15 |
| Number of shares (lakhs) | 15 | 5 |
| Earnings per share (Rs.) | 4 | 3 |
| Market value per share (Rs) | 45 | 30 |
| Price-earning ratio | 11.25 | 10 |

**For the combined company (after merged) you need to calculate (a) EPS, (b) P/E ratio, (c) Marke value per share, (d) Nuber of shares and (e) Total market capitalization. Also calculate the premium paid by Jay Co. to the shareholders of OM distributors.**

*Sol :*

Premium paid to the shareholders of OM distributors,

Value of each share in Jay Co = 0.9 × Rs. 45 = 40.5

Value of OM's share before merger = 30

Premium is Rs. 10.5 10.5

Premium percentage = 10.5/30 = 35 percent

No. of shares paid to OM's shareholders = 5 x 0.9 = 4.5 lakhs

No. of shares of the combined company = 15 + 4.5 = 19.5 lakhs

Combined profit after tax = 60 + 15 = Rs. 75 lakhs

Combined EPS = 75/19.5 = Rs. 3.85

Combined price-earning ratio = 11.25 x (60/75) + 10 x (15/75) = 11

Combined firms market capitalization: Market value per share = P/E ratio x EPS

= 11 x 3.85 = Rs. 42.35

Capitalization : MVPs x No. of shares = Rs. 45.35 x 19.5

= Rs. 825.8 lakhs

**14. The following data relate to companies BPL and CPL,**

| Particulars | BPL | CPL |
|---|---|---|
| **Earning after taxes (Rs.)** | **7,00,000** | **1,87,500** |
| **Equity shares outstanding** | **1,00,000** | **37,500** |
| **P/E ratio (times)** | **10** | **8** |
| **Market price (Rs.)** | **70** | **40** |

**Company BPL is the acquiring company, exchanging its one share for every 1.5 shares of CPL. Assume that company expects to have the same earnings and P/E ratio after the merger as before (no synergy effect), show the extent of gain accruing to the shareholders of the two companies as a result of the merger. Are they better or worse off than they were before the merger ?**



*Sol :*

EPS after the merger = $\frac{7,00,000+1,87,500}{1,00,000+25,000} = \frac{8,87,500}{1,25,000} = 7.1$

Market price after the merger = Rs. 7.1 x 10 times = 71

Total market value = Rs. 71 x 1,25,000 = 88,75,000

Gain from the merger

| | | |
|---|---|---|
| Post-Merger Market value of the firm = | | 88,75,000 |
| **Less :** Pre-merger market value | | |
| Company BPL (1,00,000 x 70) = | 70,00,000 | |
| Company CPL (37,500 x 40) = | 15,00,000 | |
| | | 85,00,000 |
| Total Gain | | 3,75,000 |

Apportionment is gain among share holders.

| Particulars | Post-Merger Value | Pre-merger Value | Difference |
|---|---|---|---|
| BPL | Rs. 71,00,000 (1,00,000 x 71) | 70,00,000 | 1,00,000 |
| CPL | 17,75,000 (25,000 x 71) | 15.00,000 | 2,75,000 |

Thus, the shareholders are better off after the merger.

**15. XYZ company is considering merging with the ABC Ltd. XYZ's shares are currently traded at Rs. 25 and it has 2,00,000 shares outstanding and earnings of Rs. 4,00,000; ABC has 1,00,000 shares outstanding and earnings of Rs. 1,00,000. The merger will occur by means of a stock swap (exchange). ABC has agreed to a plan under which XYZ will offer current market value for ABC shares (i.e., if XYZ's shares current market value is Rs. 25 and that of ABC Rs. 12.5, the exchange ratio will be Rs. 25 / Rs. 12.5 = 2)**

**(a) What are the pre-merger earnings and P/E ratios of both the companies ?**

**(b) If ABC's P/E ratio is 8, what id its current market price ? What is the exchange ratio ? What will XYZ's post-merge EPS be ?**

**(c) What must the exchange ratio be for XYZ's post-merger EPS to be the same as its EPS before the merger ?**

*Ans :* **(Dec.-19)**

(i) Pre-merger EPS and P/E ratio of XYZ and ABC Ltd.

| Particular | XYZ | ABC |
|---|---|---|
| Earning after taxes | 4,00,000 | 1,00,000 |
| Dividing the No. of shares O/S EPS | 2,00,000 | 1,00,000 |
| EPS | 2 | 1 |
| Market Price Per share | 25 | 12.5 |
| P/E Ratio (tones) | 12.5 | 12.5 |

(ii) (a) Current Market price of ABC Ltd. If P/E Ratio is 8.

= Rs 1 × 8 = Rs. 8/-

(b) Exchange Ratio = Rs. 25/8 = 3.125

(c) Post - merger EPS of xyz Ltd $= \dfrac{(\text{Rs. } 4,00,000 + \text{Rs. } 1,00,000)}{2,00,000 + 32,000}$

= Rs. 2.16

(iii) Desired Exchange ratio

(a) Total number of shares in post merged company

= Post Merger earnings / Pre-merger EPS of xyz Ltd.

= 5,00,000/2 = Rs. 2,50,000

(b) Number of shows required to be issued,

= 2,50,000 – 2,00,000 = 50,000

(c) $\therefore$ The exchange ratio is = 50,000/1,00,000.

= 0.5

# Exercise Problems

1. Based on the following information prepare a Cash Budget for ABC Ltd. :

| | 1st Quarter(?) | 2nd Quarter(?) | 3rd Quarter (?) | 4th Quarter (?) |
|---|---|---|---|---|
| Opening cash balance | 10,000 | | | |
| Collection from customers | 1,25,000 | 1,50,000 | 1,60,000 | 2,21,000 |
| **Payments :** | | | | |
| Purchase of materials | 20,000 | 35,000 | 35,000 | 54,200 |
| Other expenses | 25,000 | 20,000 | 20,000 | 17,000 |
| Salary and wages | 90,000 | 95,000 | 95,000 | 1,09,200 |
| Income tax | 5,000 | - | - | - |
| Purchase of machinery | - | - | - | 20,000 |

The company desires to maintain a cash balance of ` 15,000 at the end of each quarter. Cash can be borrowed or repaid in multiples of ` 500 at an interest of 10% per annum. Management does not want to borrow cash more than what is necessary and wants to repay as early as possible. In any event, loans cannot be extended beyond four quarters. Interest is computed and paid when the principal is repaid. Assume that borrowings take place at the beginning and payments are made at the end of the quarters.

**[Ans: Excess (deficit) Cash : 1st Quarter - 20,000, 2nd Quarter - Nil, 3rd Quarter -10,000, 4th Quarter - 20,925. Cash balance at the end of Quarters: ? 15,000,15,000,15,325 and 23,825]**

2. The present credit terms of Bharatiya Company are 1/10, net 30. Its sales are ` 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 percent. The proportion of sales in which customers currently take discount is 0.3. Bharatiya Company is considering relaxing its discount terms to 2/10, net 30. Such relaxation is expected to increase the sales by ` 1.2 million, reduce the average collection period to 16 days, and increase the proportion of discount sales to 0.7.

What will be the effect of relaxing the discount policy on residual income? The tax rate of the firm is 50 percent.

**[Ans: ARI = ` 79,200]**

3. Two materials, X and Y are used as follows Minimum usage - 50 units per week each ;

Maximum usage - 150 units per week each ;

Normal usage - 100 units per week each ;

Ordering quantity : X - 600 units and Y - 1,000 units ;

Delivery period : X - 4 to 6 weeks ; Y - 2 to 4 weeks.

Calculate for each material:

(a) Minimum Level, (b) Maximum Level, (c) Ordering Level.

**[Ans: (a) X = 400 units, Y = 300 units;**

**(b) X = 1,300 units, Y = 1,500 units;**

**(c) X = 900 units, Y = 600 units]**

4. Consider the following financial data of A Ltd and T Ltd just before the merger announcement of the latter by the former :

| Particulars | A Ltd | T Ltd |
|---|---|---|
| Market price per share | ` 150 | ` 30 |
| Number of shares (in lakh) | 10 | 6 |
| Market value (MV) of the firm (in ` lakh) | 1,500 | 180 |

Determine the cost of merger:

(i) If A Ltd intends to pay ` 240 lakh in cash to T Ltd;

(ii) If A Ltd intends to offer its 1,60,000 shares in exchange of shares of T Ltd. Assume further, the merger is expected to generate cost savings with present value of ` 94.80 lakh. It is expected that these cost savings would push up the market price.

(Note: consider each case independently)

**[Ans: (i) ` 60 lakh (ii) ` 64.80 lakh]**

# Short Question and Answers

**1. Define cash management.**

*Ans :*

Cash is one of the current assets of a business. It is needed at all times to keep the business going. A business concern should always keep sufficient cash for meeting its obligations. Any shortage of cash will hamper the operations of a concern and any excess of it will be unproductive. Cash is the most unproductive of all the assets. While fixed assets like machinery, plant, etc. and current assets such as inventory will help the business in increasing its earning capacity, cash in hand will not add anything to the concern. It is in this context that cash management has assumed much importance.

Cash is the important current asset for the operations of the business. Cash is the basic input needed to keep the business running on a continuous basis; it is also the ultimate output expected to be realised by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.

Cash is the money which a firm can disburse immediately without any restriction. The term cash includes coins, currency and cheques held by the firm, and balances in its bank accounts. Sometimes near-cash items, such as marketable securities or bank times deposits, are also included in cash. The basic characteristic of near-cash assets is that they can readily be converted into cash. Generally, when a firm has excess cash, it invests it in marketable securities. This kind of investment contributes some profit to the family.

**Meaning of Cash**

The term cash which refer to cash management is the ready currency to which all liquid assets can be reduced.

These are basically used in two sense.

1. Narrow sense and
2. Broader sense

**1. Narrow Sense**

The Narrow sense is used broadly to cover currency and generally accept equivalents of cash such as coins, currency notes cheques, bank drafts and demand deposit in bank.

**2. Broader Sense**

The Broader sense also include "Near Cash Assets" such as marketable securities and time deposits with banks. The main character is the securities or deposits can immediately be sold or converted into cash. These are also include the short term investment out lets for excess cash. Thus the term "Cash Management' is generally used for management of both cash and near cash assets.

**2. Define cash budget.**

*Ans :*

Cash budget is nothing but the written form of various forecasts relating to cash receipt and cash payments. In other words, to meet future obligations, forecasting the expected receipts and expected payments of cash is known as cash budget i.e., cash budget is a mere forecast of cash position of an undertaking for a definite period. In cash budget the budget period is normally daily, weekly, monthly or quarterly etc. There are two distinct parts of cash budgeting one is forecast the cash receipts and second forecast the cash disbursement/payments.

**According to the Guthmen and Dougal**, "Cash budget is an estimate of cash receipts and disbursements for a future period of time".

**Characteristics of Cash Budget**

1. Cash budget is a statement of anticipated cash receipts and payments.

2. Cash budget is related to predetermined future period.
3. Cash budget is expressed in terms of monetary values.
4. Cash budget is forecast of financial aspirations of the enterprise.
5. Cash budget is an outline of future plans, policies and actions of the management.

### 3. Define Marketable Securities.

*Ans :*

The marketable securities are the type of money market instrument which is highly liquid and can be easily convertible into cash within the short period of time. It is very much essential for the firm to maintain adequate cash balance for the smooth running/operations of the business as the inflows and outflows of cash are uncertain and un-synchronized.

The management of investment in marketable securities constitute the most essential function of financial management. Both cash and marketable securities are short term money market instruments hence, the cash management with regards to the investment in marketable securities need to be carefully dealt.

Many time, the firms receive more cash than what is actually needed for making immediate payments, which may be treated as surplus cash and its needs to be pooled up in the marketing securities instead of keeping them idle. In this way, surplus cash can be optimally allocated for earning more income to the business. The management of marketable securities deals with,

i) Determination of the amount of marketable securities to be maintained.
ii) Selection of best alternative from the group of alternative securities.

### 4. Characteristics of Marketable Securities.

*Ans :*

The characteristics of marketable securities have an impact on their marketability or liquidity. For becoming liquid, a security should have two main characteristics which are as follows,

1. Ready market and
2. Safety of principle.

**1. Ready Market**

Because of ready marketability feature, securities can be easily converted into cash without consuming much time. A ready market is characterized by the presence of several participants, which are spread over a wide geographical area and must have where large number of securities can be traded (either purchased or sold).

**2. Safety of Principle**

This is the nd determinant of liquidity in which there is less or even no loss in the value of marketable security over time. According to the principle of safety, short term investments can be made in only those securities that can be easily converted into cash without reducing its notional value or principle amount. However, if there is a considerable reduction in the principal amount then firm should not invest surplus cash balance into any type of security.

### 5. Define receivable management.

*Ans :*

The term receivable is defined as "debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business". When a firm sells its products or services on credit, and it does not receive cash immediately, but would be collected in the near future. Till collection, they form as current assets.

Receivables are one of the important elements of current assets of the firm. The word receivables can be explained as 'debt owed to the firm by customers arising from sale of goods or service in the ordinary course of business'.

When payment for sale of goods or services is due then firm provides trade credit to its customers and creates accounts receivables which can be acquired in future. Receivable management is also known as trade credit management. Hence, accounts receivable express the adequate time period in which customer must make payment for goods purchased. The firms provide trade credit in order to protect the sales from the competitors and attract customers who can purchase their products at reasonable prices.

### 6. Importance of Receivable Management.

*Ans :*

The importance of receivables management is as follows:

1. Liberalised credit policy helps to increase the growth of sales.
2. It helps to increase the operating profits because of more credit sales.
3. Credit policy helps to meet the competition.
4. Credit sales helps to attract not only existing customer but also the new customers in the ordinary course of business.
5. It ensures higher investment in trade debtors, which will produce larger sales.
6. It helps to minimize bad debts without taking stringent measures.
7. It facilitates adequate working capital to meet its current obligations.
8. It gives guidance to the management for effective financial planning and control.
9. It helps to make effective coordination between finance, production, sales, profit and cost.

### 7. Define Credit Policy.

*Ans :*

It is the policy where the seller sells goods on very liberal credit terms and standards. In other words, goods are sold to the customers whose creditworthiness is not up to the standards or whose financial position is doubtful.

**Advantages of Credit Policy.**

- **Increase in Sales:** Lenient credit policy increases sales because of the liberal credit terms and favourable incentives granted to customers.
- **Higher Profits:** Increase in sales leads to increase in profits, because higher level of production and sales reduces fixed cost.

### 8. Define factoring.

*Ans :*

Factoring is a fund-based financial service which provides resources to finance receivables and facilitates the collection of receivables. Factoring is defined as a method of financing whereby a company sells its trade debts at a discount to a financial institution. It is a continuous arrangement between a financial institution and a company which sells goods and services to trade customers on credit.

**Definition of Factoring**

**According to Robert W. Johnson,** Factoring is a service involving the purchase by a financial organisation, called a factor of receivables owned to manufacturers and distributors by their customers with the factor assuming full credit and collection responsibilities.

Factoring means an arrangement between a factor and his client which includes at least two of the following services :

a) Finance
b) Maintenance of accounts
c) Collection of debts
d) Protection against credit risk

### 9. Features of Factoring.

*Ans :*

**1. Improved Cash Flow**

A better cash flow helps to save time and money, leads to greater profits and increases confidence in future planning.

**2. Flexibility**

Factoring/Discounting is one of the most flexible forms of finance available to business, as the available funds increase with the value of the credit-approved invoices.

**3. Costs**

Factors/Discounters usually charge a service fee plus interest on funds utilised. The fees depend on volume of sales and the level of services that are provided.

**4. Collections**

With its professionalism and weight in the marketplace, a Factor can often collect debts more quickly and effectively then a small independent business.

**5. Credit Managemen**

The Factor/Discounter can provide the business with regular, up-to-date information on the status of its sales ledger and the performance fits trade debtors.

**6. Credit Protection**

The Factor/Discounter undertakes credit checks on the business's debtors and may set a rate for credit protection under a non-recourse arrangement. The Factor/Discounter will pay the business, regardless of whether the invoice has been paid.

**7. Credit Assessment**

A Factor/Discounter has access to credit reference databases that many businesses may not be able to afford. A Factor/Discounter can advise the business on the credit-worthiness of current and potential debtors.

**10. Advantages of Factoring.**

**1. Financial Service**

Many of the manufacturers and traders find their working capital being locked up in the form of trade debts. The major benefit of the factoring service is that the clients will be able to covert their trade debts into cash upto 80% immediately as soon as the credit sales are over. The greatest advantage is that factoring assures immediate cash flow. When the cash position improves, the client is able to make his purchases on cash basis and thus he can avail of cash discount facilities also.

**2. Collection Service**

Collection of debts in a problematic area for many concerns. Delay in collection process often leads to delay n production and supplies. This collection work is completely taken up by the factoring organization, leaving the client to concentrate on production along. The cost of collection is also cut down as a result of the professional expertise of a factor.

**3. Credit Risk Service**

In the absence of a factor, the entire credit risk has to be borne by the client himself. Once the factoring relationship is established, the client need not bother about the loss due to bad debts. The factor assumes the risk of default in payment by customers and thus, the client is assured of complete realization of his book debts. Even is the customer fails to pay the debt, it becomes the responsibility of the factor to pay that amount to the client. It is the greatest advantage of factoring.

**11. Components of Inventory.**

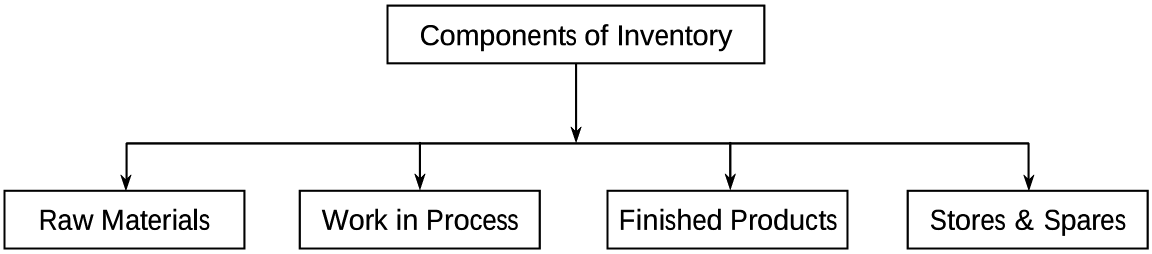
*Ans :*

**1. Raw Materials**

Raw materials are those inputs that are converted into finished goods through the manufacturing process. These form a major input for manufacturing a product. In other words, they are very much needed for uninterrupted production.

**2. Work-in-Process**

Work-in-process is that stage of stocks that are between raw materials and finished goods. Work-in-process inventories are semi-finished products. They represent the products that need to undergo some other process to become finished goods.




**3. Finished Products**

Finished products are those products, which are ready for sale. The stock of finished goods provides a buffer between production and market

**4. Stores & Spares**

Stores & spares inventory (include office and plant cleaning materials like, soap, brooms, oil, fuel, light bulbs, etc.,) are those purchased and stored for the purpose of maintenance of machinery.

**12. Main Objectives of Inventory Management.**

*Ans :*

1. To keep inventory at sufficiently high level to perform production and sales activities smoothly.
2. To minimize investment in inventory at minimum level to maximize profitability.
3. To ensure that the supply of raw material & finished goods will remain continuous so that production process is not halted and demands of customers are duly met.
4. To minimize carrying cost of inventory.
5. To keep investment in inventory at optimum level.
6. To reduce the losses of theft, obsolescence & wastage etc.
7. To make arrangement for sale of slow moving items.
8. To minimize inventory ordering costs.

**13. Economic Order Quantity (EOQ).**

A decision about how much to order has great significance in inventory management. The quantity to be purchased should neither be small nor big because costs of buying and carrying materials are very high. Economic order quantity is the size of the lot to be purchased which is economically viable.

This is the quantity of materials which can be purchased at minimum costs. Generally, EOQ is the point at which inventory carrying costs are equal to order costs. In determining economic order quantity it is assumed that cost of managing inventory is made up solely of two parts i.e. ordering costs and carrying costs.

**(i) Ordering Costs**

These are the costs which are associated with the purchasing or ordering of materials. These costs are also known as buying costs and will arise only when some purchases are made.

These costs will include costs of selling up machinery for manufacturing materials, time taken up in setting, cost of tools etc.

**(ii) Carrying Costs**

These are the costs for holding inventories. These costs will not be incurred if inventories are not carried. The Planning Commission of India has estimated these costs between 15 percent to 20 percent of total costs. The longer the materials kept in stocks, the costlier it becomes by 20 percent every year.

The ordering and carrying costs have a reverse relationship. The ordering cost goes up with the increase in number of orders placed. On the other hand, carrying costs go down per unit with the increase in number of units, purchased and stored.

**14. Features of JIT.**

*Ans :*

The main features of JIT inventory control system are as follows :

a) It emphasises that firms following traditional inventory control system overestimate ordering cost and underestimate carrying costs associated with holding of inventories.

b) It advocates maintaining good relations with suppliers so as to enable purchases of right quantity of materials at right time.

c) It involves frequent production/order runs because of smaller batch/lot sizes.

d) It requires reduction in set up time as well as processing time.

e) The major focus of JIT approach is to purchase or produce in response to need rather than as per the plans and forecasts.

**15. Define corporate restructuring.**

*Ans :*

**Introduction**

Corporate Restructuring refers to the changes in ownership, business mix, assets mix and alliances with a view to enhance the shareholder value. Hence, corporate restructuring may involve ownership restructuring, business restructuring and assets restructuring.

A company may affect ownership restructuring through mergers and acquisitions, leveraged buy-outs, buyback of shares, spin-offs, joint ventures and strategic alliance. Business restructuring involves the reorganization of business units or divisions. It includes diversification into new businesses, out-sourcing, divestments, brand acquisitions etc.

Asset restructuring involves the acquisition or sale of assets and their ownership structure. The examples of asset restructuring are sale and leaseback of assets, securitization of debt, receivable factoring etc.

**16. Define Mergers. Explain different types of mergers.**

*Ans :*

A merger is said to occur when two or more companies combine into one company. One or more companies may merge with an existing company or they may merge to form a new company. In merger, there is complete amalgamation of the assets and liabilities as well as shareholders' interests and business of the merging companies. There is another mode of merger called amalgamation. In this, one company may purchase another company without giving proportionate ownership to the shareholders' of the acquired company or without continuing the business of the acquired company.

**Types of Merger**

There are three major types of mergers :

**(a) Horizontal Mergers**

This is a combination of two or more firms in similar type of production, distribution or area of business. Example can be combining of two book publishers or two luggage manufacturing companies to gain dominant market share.

**(b) Vertical Merger**

This is a combination of two or more firms involved in different stages of production or distribution. For example, joining of a TV manufacturing company and a TV marketing company or the joining of a spinning company and a weaving company. Vertical merger may take the form of forward or backward merger. When a company combines with the supplier of material, it is called backward merger and when it combines with the customer, it is called forward merger.

**(c) Conglomerate Merger**

This is a combination of firms engaged in unrelated lines of business activity. A typical example is merging of different business like manufacturing of cement products, fertilizers products, electronic products, insurance investment and advertising agencies. Voltas Ltd. is an example of a conglomerate company.

**Table : Present Value Interest Factor (PVIF)**

| Year | 1 % | 2 % | 3 % | 4 % | 5 % | 6 % | 7 % | 8 % | 9 % | 10 % |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.990 | 0.980 | 0.971 | 0.926 | 0.952 | 0.943 | 0.935 | 0.926 | 0.917 | 0.909 |
| 2 | 0.980 | 0.961 | 0.943 | 0.925 | 0.907 | 0.890 | 0.873 | 0.857 | 0.842 | 0.826 |
| 3 | 0.971 | 0.942 | 0.915 | 0.889 | 0.864 | 0.840 | 0.816 | 0.794 | 0.772 | 0.751 |
| 4 | 0.961 | 0.961 | 0.924 | 0.888 | 0.855 | 0.823 | 0.792 | 0.735 | 0.708 | 0.683 |
| 5 | 0.651 | 0.906 | 0.863 | 0.822 | 0.784 | 0.747 | 0.713 | 0.681 | 0.650 | 0.621 |
| 6 | 0.942 | 0.888 | 0.837 | 0.790 | 0.746 | 0.705 | 0.666 | 0.630 | 0.596 | 0.564 |
| 7 | 0.933 | 0.871 | 0.813 | 0.760 | 0.711 | 0.665 | 0.623 | 0.583 | 0.547 | 0.513 |
| 8 | 0.923 | 0.853 | 0.789 | 0.731 | 0.677 | 0.627 | 0.582 | 0.540 | 0.502 | 0.467 |
| 9 | 0.914 | 0.837 | 0.766 | 0.703 | 0.645 | 0.592 | 0.544 | 0.500 | 0.460 | 0.424 |
| 10 | 0.905 | 0.82 | 0.744 | 0.676 | 0.614 | 0.558 | 0.508 | 0.463 | 0.422 | 0.386 |
| 11 | 0.896 | 0.804 | 0.722 | 0.650 | 0.585 | 0.527 | 0.475 | 0.429 | 0.388 | 0.350 |
| 12 | 0.887 | 0.789 | 0.701 | 0.625 | 0.557 | 0.497 | 0.444 | 0.397 | 0.356 | 0.319 |
| 13 | 0.879 | 0.773 | 0.681 | 0.601 | 0.530 | 0.469 | 0.415 | 0.368 | 0.326 | 0.290 |
| 14 | 0.870 | 0.758 | 0.661 | 0.577 | 0.505 | 0.442 | 0.388 | 0.340 | 0.299 | 0.263 |
| 15 | 0.861 | 0.743 | 0.642 | 0.555 | 0.481 | 0.417 | 0.362 | 0.315 | 0.275 | 0.239 |
| 16 | 0.853 | 0.728 | 0.623 | 0.534 | 0.458 | 0.394 | 0.339 | 0.292 | 0.252 | 0.218 |
| 17 | 0.844 | 0.714 | 0.605 | 0.513 | 0.436 | 0.371 | 0.317 | 0.270 | 0.231 | 0.198 |
| 18 | 0.836 | 0.700 | 0.587 | 0.494 | 0.416 | 0.350 | 0.296 | 0.250 | 0.212 | 0.180 |
| 19 | 0.823 | 0.686 | 0.570 | 0.475 | 0.396 | 0.331 | 0.227 | 0.232 | 0.194 | 0.164 |
| 20 | 0.820 | 0.673 | 0.554 | 0.456 | 0.377 | 0.312 | 0.258 | 0.215 | 0.178 | 0.149 |
| 21 | 0.811 | 0.660 | 0.538 | 0.439 | 0.359 | 0.294 | 0.242 | 0.199 | 0.164 | 0.135 |
| 22 | 0.803 | 0.647 | 0.522 | 0.422 | 0.342 | 0.278 | 0.226 | 0.184 | 0.150 | 0.123 |
| 23 | 0.795 | 0.634 | 0.507 | 0.406 | 0.326 | 0..262 | 0.211 | 0.170 | 0.138 | 0.112 |
| 24 | 0.788 | 0.622 | 0492 | 0.390 | 0.310 | 0.247 | 0.197 | 0.158 | 0.126 | 0.102 |
| 25 | 0.780 | 0.610 | 0.478 | 0.375 | 0.295 | 0.233 | 0.184 | 0.146 | 0.116 | 0.092 |
| 30 | 0.742 | 0.552 | 0.412 | 0.308 | 0.231 | 0.174 | 0.131 | 0.099 | 0.075 | 0.057 |

**Table : Present Value Interest Factor (PVIF)**

| Year | 11 % | 12 % | 13 % | 14 % | 15 % | 16 % | 17 % | 18 % | 19 % | 20 % |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.901 | 0.893 | 0.885 | 0.877 | 0.870 | 0.862 | 0.855 | 0.847 | 0.840 | 0.833 |
| 2 | 0.812 | 0.797 | 0.783 | 0.769 | 0.756 | 0.743 | 0.731 | 0.718 | 0.706 | 0.694 |
| 3 | 0.731 | 0.712 | 0.693 | 0.675 | 0.658 | 0.641 | 0.624 | 0.609 | 0.593 | 0.579 |
| 4 | 0.656 | 0.636 | 0.613 | 0.592 | 0.572 | 0.552 | 0.534 | 0.516 | 0.499 | 0.482 |
| 5 | 0.593 | 0.567 | 0.543 | 0.519 | 0.497 | 0.476 | 0.456 | 0.437 | 0.419 | 0.402 |
| 6 | 0.535 | 0.507 | 0.480 | 0.456 | 0.432 | 0.410 | 0.390 | 0.370 | 0.352 | 0.335 |
| 7 | 0.482 | 0.452 | 0.425 | 0.400 | 0.376 | 0.354 | 0.333 | 0.314 | 0.296 | 0.279 |
| 8 | 0.434 | 0.404 | 0.376 | 0.351 | 0.327 | 0.305 | 0.285 | 0.266 | 0.249 | 0.233 |
| 9 | 0.391 | 0.361 | 0.333 | 0.308 | 0.284 | 0.263 | 0.243 | 0.225 | 0.209 | 0.194 |
| 10 | 0.352 | 0.322 | 0.295 | 0.270 | 0.247 | 0.227 | 0.208 | 0.191 | 0.176 | 0.162 |
| 11 | 0.317 | 0.287 | 0.261 | 0.237 | 0.215 | 0.195 | 0.178 | 0.162 | 0.148 | 0.135 |
| 12 | 0.286 | 0.257 | 0.231 | 0.208 | 0.187 | 0.168 | 0.152 | 0.137 | 0.124 | 0.112 |
| 13 | 0.258 | 0.229 | 0.204 | 0.182 | 0.163 | 0.145 | 0.130 | 0.116 | 0.104 | 0.093 |
| 14 | 0.232 | 0.205 | 0.181 | 0.160 | 0.141 | 0.125 | 0.111 | 0.099 | 0.088 | 0.078 |
| 15 | 0.209 | 0.183 | 0.160 | 0.140 | 0.123 | 0.108 | 0.095 | 0.084 | 0.074 | 0.065 |
| 16 | 0.188 | 0.163 | 0.141 | 0.123 | 0.107 | 0.093 | 0.081 | 0.071 | 0.062 | 0.054 |
| 17 | 0.170 | 0.146 | 0.125 | 0.108 | 0.093 | 0.080 | 0.069 | 0.060 | 0.052 | 0.045 |
| 18 | 0.153 | 0.130 | 0.111 | 0.095 | 0.081 | 0.069 | 0.059 | 0.051 | 0.044 | 0.038 |
| 19 | 0.138 | 0.116 | 0.098 | 0.083 | 0.070 | 0.060 | 0.051 | 0.043 | 0.037 | 0.031 |
| 20 | 0.124 | 0.104 | 0.087 | 0.073 | 0.061 | 0.051 | 0.043 | 0.037 | 0.031 | 0.026 |
| 21 | 0.112 | 0.093 | 0.077 | 0.064 | 0.053 | 0.044 | 0.037 | 0.031 | 0.026 | 0.22 |
| 22 | 0.101 | 0.083 | 0.068 | 0.056 | 0.046 | 0.038 | 0.032 | 0.026 | 0.022 | 0.018 |
| 23 | 0.091 | 0.074 | 0.060 | 0.049 | 0.040 | 0.033 | 0.027 | 0.022 | 0.018 | 0.015 |
| 24 | 0.074 | 0..059 | 0.047 | 0.038 | 0.030 | 0.024 | 0.020 | 0.016 | 0.013 | 0.010 |
| 25 | 0.074 | 0.059 | 0.047 | 0.038 | 0.030 | 0.024 | 0.020 | 0.016 | 0.013 | 0.010 |
| 30 | 0.044 | 0.033 | 0.026 | 0.020 | 0.015 | 0.012 | 0.009 | 0.007 | 0.005 | 0.004 |

# *Internal Assessment (Mid Examinations)*

The pattern of Mid Exams or Continuous Internal Evaluation (CIE) prescribed by the JNTU-H as per the Regulations 2019 (R19) for all the semesters is as follows,

- There would be two Mid Exams or Continuous Internal Evaluation (CIE) for each semester,
  - The **I**$^{st}$ **Mid Term Examinations** would be conducted during the Middle of the Semester.
  - The **II**$^{nd}$ **Mid Term Examinations** during the last week of instructions.
- The Mid Exam I and II would have the same pattern of question paper which would carry **25 Marks** each and the time duration for conducting each Mid exam would be 120 min.
- The pattern of Mid Exam Question Paper would consist of two parts i.e., **Part-A** and **Part-B.**
  - **Part-A** consist of 5 compulsory questions each carries 2 marks (i.e $5 \times 2 = 10$ marks).
  - **Part-B** consist of 5 questions out of which 3 questions should be answered, each question carries 5 marks (i.e $5 \times 3 = 15$ marks).
- The average of the two Mid exams will be added with the 75 marks of External end examination which equals to 100 marks (i.e $25 + 75 = 100$).

## UNIT - I

**Part - A**

1. Define financial management. (Refer Unit-I, SQA-2)
2. Agency relationship. (Refer Unit-I, SQA-5)
3. Define risk return trade off. (Refer Unit-I, SQA-7)
4. Define finance function. (Refer Unit-I, SQA-1)

**Part - B**

1. Define Financial management ? Explain the nature and scope of financial management. (Refer Unit-I, Q.No. 2)
2. Discuss about time value of money ? Explain the technique of time value of money. (Refer Unit-I, Q.No. 18, 19)
3. Find out the present value of Rs. 2,000 received after in 10 years hence, if discount rate is 8%. (Refer Unit-I, Prob. 3)
4. A limited company borrows from a commercial bank of Rs. 10,00,000 at 12 percent rate of interest to be paid in equal annual end-of-year installments. What would the size of the installment be? Assume the repayment period is 5 years. (Refer Unit-I, Prob. 4)
5. Differentiate between Profit maximation Vs. Wealth maximation Vs. Welfare maximation. (Refer Unit-I, Q.No. 12)

## UNIT - II

### Part - A

1. Define capital budgeting. (Refer Unit-II, SQA-1)
2. Define payback method. (Refer Unit-II, SQA-4)
3. Explain the differences between NPV and IRR. (Refer Unit-II, SQA-8)
4. Define internal rate of return. (Refer Unit-II, SQA-7)
5. Define weighted marginal cost of capital. (Refer Unit-II, SQA-11)

### Part - B

1 Define Capital Budgeting. Explain the characteristics of capital budgeting. (Refer Unit-II, Q.No. 1, 3)

2. Outline the process of capital budgeting. (Refer Unit-II, Q.No. 4)
3. Explain the traditional techniques of capital budgeting. (Refer Unit-II, Q.No. 9, 10)
4. Calculate NPV for the given project.

| Year | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| (A) Cash flows | 200 | 35 | 80 | 90 | 75 | 20 |
| (B) Cash flows | 200 | 18 | 10 | 10 | 40 | 35 |

The company anticipates the cost of capital of 12%. Rank the project according to it ? (Refer Unit-II, Prob. 10)

5. State the various measures cost of capital (Refer Unit-II, Q.No. 28, 29, 30, 31)

## UNIT - III

### Part - A

1. Define financial leverage. (Refer Unit-III, SQA-5)
2. Explain net income approach. (Refer Unit-III, SQA-7)
3. Define share split. (Refer Unit-III, SQA-12)
4. Define capital structure. (Refer Unit-III, SQA-1)
5. State the assumptions of capital structure. (Refer Unit-III, SQA-6)

### Part - B

1. Define capitalization ? Explain the theories of capitalization ? (Refer Unit-III, Q.No. 5, 6)
2. Define leverage ? Explain different types of leverages (Refer Unit-III, Q.No. 10, 12, 13, 14)
3. Explain various factors determining dividend. (Refer Unit-III, Q.No. 30)
4. Techno Manpower Ltd. expecting EBIT of Rs. 5,00,000 per annum on investment of Rs.10,00,000. Company is in need of Rs.8,00,000 for its expansion activities. Company can raise this amount by either equity shares capital or 12% preference share capital or 10% debentures. The company is considering the following financing patterns. :

(a) 10,00,000 through issues of Equity Shares at par;

(b) 5,00,000 by issue of Equity Share Capital and remaining 5,00,000 by issue of debentures;

(c) 5,00,000 through Equity Shares and 2,50,000 through 12% Preference Share Capital and remaining 2,50,000 through 10% debentures.

(d) 5,00,000 through debt and 2,50,000 through Equity Shares and remaining 2,50,000 through 12% preference Share Capital.

Find out the best financing mix assuming 50% tax rate.

(Refer Unit-III, Prob. 10)

5. The EPS of a company is 10 Rs. market capitalization factor is 10%. The Co. has options of adapting payout of 20%, 40%, 80%. Using the walter formulae calculate market value of the share if the co's return on invest is (i) 8%, (ii) 10%, (iii) 20%. (Refer Unit-III, Prob. 17)

## UNIT - IV

### Part - A

1. Define working capital. (Refer Unit-IV, SQA-1)
2. Explain the components of working capital. (Refer Unit-IV, SQA-2)
3. Define trade credit. (Refer Unit-IV, SQA-8)
4. Explain operating life cycle approach. (Refer Unit-IV, SQA-6)

### Part - B

1. What are the differences between Gross Vs Net Working Capital. (Refer Unit-IV, Q.No. 5)
2. Explain the different methods of working capital ? (Refer Unit-IV, Q.No. 9)
3. Explain the factors determining the Working Capital requirements ? (Refer Unit-IV, Q.No. 6)
4. Define working capital ? State the various sources of working capital. (Refer Unit-IV, Q.No. 1, 10)
5. Determine the working required to finance a level of activity of 1,80,000 units of output for a year. The cost structure is as under:

| | Cost per unit (Rs.) |
|---|---|
| Raw Materials | 20 |
| Direct Labour | 5 |
| Overheads (including depreciation of Rs. 5) | 15 |
| Total cost | 40 |
| Profit | 10 |
| Selling Price | 50 |

Additional Information:

- Minimum desired cash balance is Rs. 20,000
- Raw materials are held in stock, on an average, for 2 months

- Work-in-progress (assume 50 per cent completion stage) will approximate to half-a-month production
- Finished goods remain in warehouse, on an average for a month
- Suppliers for materials extend a month's credit and debtors are provided 2 months credit. The cash sales are 25 per cent of total sales
- There is a time lag in payment of wages for a month and half-a-month in the case of overheads.

(Refer Unit-IV, Prob. 5)

## UNIT - V

**Part - A**

1. Define cash management. (Refer Unit-V, SQA-1)
2. Define receivable management. (Refer Unit-V, SQA-5)
3. Define economic order quantity. (Refer Unit-V, SQA-13)
4. Define corporate restructuring. (Refer Unit-V, SQA-15)
5. State the features of factoring. (Refer Unit-V, SQA-9)

**Part - B**

1. Define cash management? Explain the objective of cash management. (Refer Unit-V, Q.No. 1, 2)
2. Define cash budget. Explain the objective of cash budget. (Refer Unit-V, Q.No. 6)
3. Explain the various methods to preparation of cash budget. (Refer Unit-V, Q.No. 8)
4. Explain advantages and disadvantages of credit policy. (Refer Unit-V, Q.No. 15)
5. What are the differences between mergers and acquisitions. (Refer Unit-V, Q.No. 46)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R19**

**M.B.A II - Semester Examination**

**October / November - 2020**

FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**Note:** Answer any **Five** questions

All questions carry equal marks

**PART - A (5 × 5 = 25 Marks)**

**ANSWERS**

1 . (a) What are the basic financial decisions? How do they involve risk-return tradeoff ? **(Unit-I, Q.No.17)**

(b) Explain about discounting and compounding. **(Unit-I, Q.No.20)**

2. (a) The profit maximization is not a operationally feasible criterion". Discuss. **(Unit-I, Q.No.7)**

(b) Explain about risk-return tradeoff. **(Unit-I, Q.No.17)**

3. Equipment A has a cost of 7,50,000 and net cash flow of Rs.2,00,000 per year for 6 years. A substitute equipment B would cost Rs.5,00,000 and generate net cash flow of Rs. 140,000 per year for six years. The required rate of return of both equipment is 11%. Calculate the IRR and NPV for the equipment. Which equipment should be accepted and why ?

*Sol :*

Given,

| Particulars | Equipment A | Equipment B |
|---|---|---|
| Cost of Equipment | 7,50,000 | 5,00,000 |
| Annual cash inflow | 2,00,000 | 1,40,000 |
| Life | 6 years | 6 years |
| Rate of Return | 11% | 11% |

**(a) Calculation of NPV**

**Equipment A**

= Annual cash flow × Present – Cashflow
Value@ 11%
2,00,000 × 4.231 – 7,50,000
8,46,200 – 7,50,000
= 96,200

**Equipment B**

NPV = (1,40,000 × 4.231) – 5,00,000

$= 5{,}92{,}340 - 5{,}00{,}000$

$= 92{,}340$

**(b) Calculation of IRR**

**Equipment A**

$$\text{Fake payback period} = \frac{\text{Initial investment}}{\text{Annual cashflows}}$$

$$= \frac{7{,}50{,}000}{2{,}00{,}000}$$

$$= 3.75$$

According to PV annuity table, 3.75 lies between 15% and 16% against 6 years.

Present value of 15%

$= 2{,}00{,}000 \times 3.784$

$= 7{,}56{,}8000$

Present value of 16%

$= 2{,}00{,}000 \times 3.685$

$= 7{,}37{,}000$

$$\text{IRR} = \text{Lower Rate} + \frac{\text{PVCF@lower rate} - \text{cashout flow}}{\text{PVCF@lower rate} - \text{PVCF@ higher rate}} \times \text{difference in discount rates}$$

$$= 15 + \frac{7{,}56{,}800 - 7{,}50{,}000}{7{,}56{,}800 - 7{,}37{,}000} \times 1$$

$$= 15 + \frac{16{,}800}{19{,}800} \times 1$$

$= 15 + 0.34$

$= 15.34$

**Equipment B**

$$\text{Fake payback period} = \frac{5{,}00{,}000}{1{,}40{,}000} = 3.57$$

According to PV annuity table PV, factors 3.57 lies between 17% and 18% for 6 years.

Present value at 17%

$1{,}40{,}000 \times 3.589$

$= 5{,}02{,}460$

Present value at 18%

$1,40,000 \times 3.498$

$= 4,89,720$

$$\text{IRR} = 17 + \frac{5,02,460 - 5,00,000}{5,02,460 - 4,89,720} \times 1$$

$$\text{IRR} = \text{Lower Rate} + \frac{\text{PVCF@lower rate} - \text{cashout flow}}{\text{PVCF@lower rate} - \text{PVCF@ higher rate}} \times \text{difference in discount rates}$$

$$= 17 + \frac{2,460}{12,740} \times 1$$

$= 17 + 0.19$

$= 17.19\%$

| | A | B |
|---|---|---|
| NPV | 96,200 | 92,340 |
| IRR | 15.34% | 17.19% |

**Interpretation**

Equipment A should be accepted as NPV higher compared to equipment B and wealth of the shareholders will be satisfied if equipment A is selected.

4. A firm finances all its investments by 40 percent debt and 60 percent equity. The estimated required rate of return on equity is 20 percent after-taxes and debt is 8 percent after-taxes. The firm is considering an investment proposal Rs.4,00,000 with the expected return that will last forever. What amount must the proposal yield per year so that the market price of the share does not change ?

*Sol :*

Debt $\rightarrow$ $0.04 \times 0.08$ – 0.032

Equity $\rightarrow$ $0.60 \times 0.20$ – 0.120

0.150

Investment proposal must earn

60,800 per annum i.e., $0.152 \times 4,00,000$

| Particulars | Amount |
|---|---|
| Annual Rates before taxes Interest | 60,800 |
| (–) Debt ($0.08 \times 0.40 \times 4,00,000$) | 12,800 |
| Return on Equity | 48,000 |

Calculation of Rate of Return on Equity after tax

$$= \frac{48,000}{0.60 \times 4,00,000}$$

$$= \frac{48,000}{2,40,000} = 0.20 \text{ (or) } 20\%$$

5. The following information for Konark enterprises :

| | Rs. in lakh |
|---|---|
| EBIT | 1,120 |
| PBT | 320 |
| Fixed cost | 700 |

Calculate percentage change in earnings per share if sales are increased by 5 percent.

*Sol :*

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{Profit Before Tax(PBT)}}$$

Contribution = EBIT + fixed cost

= 11,20,000 + 7,00,000

= 18,20,000

Profit Before Tax(PBT) = 3,20,000

$$\text{Combined leverage} = \frac{18,20,000}{3,20,000}$$

= 5.6875

Thus, if sales are expected to increase by 5% then EPS will increase by 28.4375($5.6875 \times 5\%$)

6. (a) Explain the factors that influence the planning of the capital structure. **(Unit-III, Q.No.3)**

(b) What is informational content of dividend payments? How does it affect the share value? **(Unit-III, Q.No.34)**

7. ABC Ltd sells goods in domestic market on a gross profit of 25 percent, not counting depreciation as a part of the 'cost of goods sold'. Its estimates for next year are as follows :

| | Amount (Rs. in lakh) |
|---|---|
| Sales-Home at 1 month's credit | 1200 |
| Exports at 3 months credit, selling price 10 percent below Home Price | 540 |
| Materials used (suppliers extend 2 month's credit) | 450 |
| Wages paid, 1/2 month in arrears | 360 |
| Manufacturing expenses (cash) paid, 1 month in arrears | 540 |
| Depreciation on fixed assets | 60 |
| Administrative expenses, paid 1 month in arrears | 120 |
| Sales promotion expenses (payable quarterly- in advance). | 60 |
| Income-tax payable in 4 instalments of which one falls in the next financial year | 150 |

The company keeps 1 month's stock of each of raw materials and finished goods and believes in keeping Rs.20 lakhs as cash. Assuming a 15 percent safety margin, ascertain the estimated working capital requirement of the company.

*Ans :*

**Statement showing changes in working capital of ABC Ltd.**

| Particulars | Amount | Amount |
|---|---|---|
| **Current Assets** | | |
| Rawmaterials $\left(450 \times \frac{1}{12}\right)$ | 37.50 | |
| Finished Goods $\left(1470 \times \frac{1}{12}\right)$ | 122.50 | |
| Cash | 20.00 | |
| Domestic market $\left(1200 \times 0.75 \times \frac{1}{12}\right)$ | 75.00 | |
| Export market $\left(600 \times 0.75 \times \frac{3}{12}\right)$ | 112.50 | |
| Sales promotion $\left(60 \times \frac{3}{12}\right)$ | 15.00 | 382.50 |
| Total Current Assets (A) | | 382.50 |
| **Current Liabilities** | | |
| Rawmaterial $\left(450 \times \frac{2}{12}\right)$ | 75.00 | |
| Wages $\left(360 \times \frac{0.5}{12}\right)$ | 15.00 | |
| Manufacturting expenses $\left(540 \times \frac{1}{12}\right)$ | 45.00 | |
| Administrative expenses $\left(120 \times \frac{1}{12}\right)$ | 10.00 | 145 |
| Total current liabilities (B) | | 145 |
| Working capital (A – B) | | 237.50 |

**Working Notes :**

1. Calculation of cost of production

| Particulars | Amount |
|---|---|
| Materials used | 450 |
| Wages paid | 360 |
| Manufacturing expenses | 540 |
| Administrative expenses | 120 |
| | 1470 |

2. Export market selling price 10% below home price $= \frac{540}{0.90} = 600$ lacks

8. (a) Explain the techniques that can be used to accelerate the firm's collection. **(Unit-V, Q.No.10)**

   (b) How does cash budget help in planning the firm's cash flows? Discuss. **(Unit-V, Q.No.6)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R17**

**M.B.A II - Semester Examination**

**December - 2019**

## FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

Note : This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A, Part B consists of 5 units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

### PART - A (5 × 5 = 25 Marks)

**ANSWERS**

1. (a) Explain the goals of finance functions. **(Unit-I, SQA- 4)**

(b) What is weighted average cost of capital and marginal cost of capital ? **(Unit-II, SQA-10, 11)**

(c) What similarities are there between the risk-adjusted discount rate method and the certainty-equivalent method ? **(Unit-II, SQA-12)**

(d) What is 'informational content' of divided payments ? Explain. **(Unit-III, Q.No.34)**

(e) A firm has been offered cost management service by a bank for Rs. 1,00,000 per year. It is estimated that such a service would not only eliminate 'excess' cash on deposits (Rs. 8,00,000) but also reduce its administration and other costs to the tune of Rs. 5,000 per month. Assuming the cost of capital of 15 percent, is it worthwhile for the firm to engage the cash management service ? **(Unit-V, Prob.4)**

### PART - B (5 × 10 = 50 Marks)

2. (a) 'The wealth maximization objective provides an operationally appropriate decision criteria'. Discuss. **(Unit-I, Q.No. 7)**

(b) Explain briefly agency theory. **(Unit-I, Q.No. 15)**

OR

3. (a) A limited company borrows from a commercial bank of Rs. 10,00,000 at 12 percent rate of interest to be paid in equal annual end-of-year installments. What would the size of the installment be? Assume the repayment period is 5 years. **(Unit-I, Prob. 4)**

(b) Explain about sensitivity analysis. **(Unit-II, Q.No. 20, Point (iii))**

4. A company is planning to purchase a machine to meet the increased demand for its products in the market. The machine costs Rs. 5,00,000 and has no salvage value. The expected life of the machine is 5 years, and the company

employs straight line method of depreciation for tax purposes. The estimated earnings after taxes are Rs. 50,000 each year for 5 years. The after-tax required rate of return of the company is 12 percent. Determine the IRR. **(Unit-II, Prob. 15)**

OR

5. (a) Z ltd, is forecasting a growth rate of 12 percent per annum in the next 2 years. The growth rate is likely to fall to 10 percent for the third year and the fourth year. After that, the growth rate is expected to stabilize at 8 percent per annum. If the last dividend was Rs. 1.50 per share and the investor's required rate of return is 16 percent, find out the intrinsic value per share of Z ltd as of data. **(Unit-II, Prob. 25)**

   (b) Discuss the approach to determine the cost of retained earnings. **(Unit-II, Q.No. 31)**

6. The well-established company's most recent balance sheet is as follows

| Liabilities | Amount | Assets | Amount |
|---|---|---|---|
| Equity Capital (Rs. 10 per sheet) | Rs. 6,00,000 | Net fixed assets | Rs. 15,00,000 |
| 10% Loan-term debt | Rs. 8,00,000 | Current assets | Rs. 5,00,000 |
| Retained earnings | Rs. 2,00,000 | | |
| Current liabilities | Rs. 4,00,000 | | |
| Total | Rs. 20,00,000 | Total | 20,00,000 |

The company's total assets turnover ratio is 3, its fixed operating costs are Rs. 10,00,000 and the variable costs ratio is 40 percent. The income tax rate is 35 percent.

(a) Calculate all the three types of leverages.

(b) Determine the likely level of EBIT if EPS is

(i) Rs. 1 (ii) Rs. 3 and (iii) Zero **(Unit-III, Prob. 11)**

OR

7. (a) Explain the relationship between leverage and the cost of capital. **(Unit-III, Q.No. 11)**

   (b) What is the indifference point in the EBIT-EPS analysis ? How would you compare it ? **(Unit-III, Q.No. 16)**

8. (a) What are the assumptions and arguments used by Modigliani and Miller in support of the irrelevance of dividends ? Are dividends really irrelevant? Discuss. **(Unit-III, Q.No. 29)**

   (b) Explain the major forms of dividends. **(Unit-III, Q.No. 33)**

OR

9. XYZ Ltd. information is given below

Production of the year 69,000 units

Finished goods in store, 3 months

Raw material in store 2 months consumption

Production process 1 month

Credit allowed by creditors, 2 months

Credit given to debtors, 3 months

Selling price per unit Rs. 50

Raw material 50 percent of selling price

Direct wages, 10 percent of selling price

Manufacturing and administrative overheads, 16 percent of selling price

Selling over heads, 4 percent of selling price

There is a regular production and sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle.

Calculate the working capital requirement. **(Unit-IV, Prob. 7)**

10. (a) What are credit standards ? What key variables should be considered in evaluating possible changes in credit standards? **(Unit-V, Q.No. 17)**

    (b) What are the limitations of ABC inventory control system ? **(Unit-V, Q.No. 31)**

OR

11. XYZ company is considering merging with the ABC Ltd. XYZ's shares are currently traded at Rs. 25 and it has 2,00,000 shares outstanding and earnings of Rs. 4,00,000; ABC has 1,00,000 shares outstanding and earnings of Rs. 1,00,000. The merger will occur by means of a stock swap (exchange). ABC has agreed to a plan under which XYZ will offer current market value for ABC shares (i.e., if XYZ's shares current market value is Rs. 25 and that of ABC Rs. 12.5, the exchange ratio will be Rs. 25 / Rs. 12.5 = 2)

    (a) What are the pre-merger earnings and P/E ratios of both the companies ?

    (b) If ABC's P/E ratio is 8, what id its current market price ? What is the exchange ratio ? What will XYZ's post-merge EPS be ?

    (c) What must the exchange ratio be for XYZ's post-merger EPS to be the same as its EPS before the merger ? **(Unit-V, Prob. 15)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R17**

**M.B.A II - Semester Examination**

**April / May - 2019**

## FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**Note:** This question paper contains two parts A and B.

**Part A** is compulsory which carries 25 marks. Answer all questions in Part A.

**Part B** consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A (5 × 5 = 25 Marks)**

**ANSWERS**

1 . Write short notes on the following:

(a) Risk Return trade off. **(Unit-I, Q.No.17)**

(b) Cost of Equity Capital. **(Unit-II, Q.No.30)**

(c) Financial Leverage. **(Unit-III, SQA.5)**

(d) Trade Credit.

*Ans :*

Trade credit refers to the credit which is extended to the buyer of the goods or services from its supplier or in other words customer is allowed to purchase the goods or services on account from the supplier without paying the money upfront and the due money can be paid at a later date as mentioned in the term of sale between the parties involved.

(e) Credit Policy. **(Unit-V, SQA.7)**

**PART - B (5 × 10 = 50 Marks)**

2. Why is Wealth Maximization goal thought to be a better operating goal than profit maximization ? **(Unit-I, Q.No.11)**

OR

3. Write about:

(a) Goals of finance function. **(Unit-I, Q.No.7)**

(b) Time value of money. **(Unit-I, Q.No.18,19)**

4. What is Cost of Capital? Explain the importance of cost of capital in capital budgeting decisions. **(Unit-II, Q.No.21,22)**

OR

5. A company is considering investing in a project that cost ` 4,00,000. The estimated salvage value is zero, tax rate is 55 percent. Depreciation is calculated based on straight line method. The projected cash flows before tax (CFBT) are as follows:

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| CFBT(`) | 1,00,000 | 1,20,000 | 1,50,000 | 1,70,000 | 2,50,000 |

(a) Net Present value at 10 percent cost of capital.

(b) Internal Rate of Return.

(c) Pay Back Period.

*Sol :*

Calculation of Cashflows

| Years | CFBT | Tax@55% | CFAT | Depreciation | Cash in flows |
|---|---|---|---|---|---|
| 1 | 1,00,000 | 55,000 | 45,000 | 80,000 | 1,25,000 |
| 2 | 1,20,000 | 66,000 | 54,000 | 80,000 | 1,34,000 |
| 3 | 1,50,000 | 82,500 | 67,500 | 80,000 | 1,47,500 |
| 4 | 1,70,000 | 93,500 | 76,500 | 80,000 | 1,56,500 |
| 5. | 2,50,000 | 1,37,500 | 76,500 | 80,000 | 1,92,000 |

**(a) Calculation of NPV at 10% cost capital**

| Year | Cash in flows | PV factor @ 10% | Present value |
|---|---|---|---|
| 1 | 1,25,000 | 0.909 | 1,13,625 |
| 2 | 1,34,000 | 0.826 | 1,10,684 |
| 3 | 1,47,500 | 0.751 | 1,10,773 |
| 4 | 1,56,500 | 0.683 | 1,06,889 |
| 5 | 1,92,500 | 0.621 | 1,19,543 |
| | | | 5,61,514 |

NPV = Cash in flows – Cash out flows

5,61,514 – 4,00,000

= 1,61,514

**(b) Internal Rate of Return**

As NPV calculated at 10% is positive we must calculate NPV at a higher Rate of discount

i.e., 25% as follows

| Year | Cash in flows | PV factor @ 10% | Present value |
|---|---|---|---|
| 1 | 1,25,000 | 0.800 | 1,00,000 |
| 2 | 1,34,000 | 0.640 | 85,760 |
| 3 | 1,47,500 | 0.512 | 75,520 |
| 4 | 1,56,500 | 0.410 | 64,165 |
| 5 | 1,92,500 | 0.328 | 63,140 |
| | | | 3,88,585 |

NPV at 25% = 3,88,585 – 4,00,000

= – 11,415

$$\text{IRR} = 10\% + \frac{1,61,514}{5,61,514 - 3,88,585} \times 15$$

$$10 + \frac{1,61,514}{1,72,929} \times 15$$

10 + 14.01 = 24.01%

**(c) Payback period**

| Particulars | Amount |
|---|---|
| Cash outay of project | 4,00,000 |
| Total cash inflow for first 2 years | 2,59,000 |
| | 1,41,000 |
| Cash inflow for the 3rd year | 1,47,500 |

$$\text{Payback period} = 2 + \frac{1,41,000}{1,47,500}$$

= 2.956 years

6. Explain the factors determining the dividend policy of company. **(Unit-III, Q.No.30)**

OR

7. The sales of Hasini Ltd. are 20,000 units at the rate of ` 20 each. The variable cost per unit is ` 8 per unit. The fixed expenses are ` 50,000. The company employs 10% debentures of ` 5,00,000 in its capital structure. You are required to calculate

(a) Degree of operating leverage

(b) Degree of Financial leverage

(c) Degree of combined leverage.

*Ans :*

**(a) Calculation of degree of operating leverage**

| | Particulars | Amount |
|---|---|---|
| | Sales $(20,000 \times 20)$ | 4,00,000 |
| (–) | Variable cost $(20,000 \times 8)$ | 1,60,000 |
| | Contribution | 2,40,000 |
| (–) | Fixed cost | 50,000 |
| | Operating profit (EBIT) | 1,90,000 |

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$= \frac{2,40,000}{1,90,000}$$

$$= 1.26$$

**(b) Calculation of degree of financial leverage**

| | Particulars | Amount |
|---|---|---|
| | EBIT | 1,90,000 |
| (–) | Interest on debt $(5,00,000 \times 10\%)$ | 50,000 |
| | Profit before tax(PBT) | 1,40,000 |

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{PBT}}$$

$$= \frac{1,920,000}{1,40,000} = 1.36$$

**(c) Calculation of combined leverage**

Combined leverage = operating leverage × financial leverage

$$= 1.26 \times 1.36$$

$$= 1.7136$$

8. What is Working Capital Management ? What are the sources of Working Capital ? **(Unit-IV, Q.No.1,2)**

OR

9. From the following information presented by a manufacturing company, prepare statement of working capital requirement. Expected sales are 1,20,000 units at the rate of ` 100 per unit. The cost per unit in ` consists of:

| | | |
|---|---|---|
| Raw material | 45 | |
| Labour | 22 | |
| Overheads | 13 | |
| Profit | 20 | |
| Raw material in stock, on average | | one month |
| Material in process, on average | | one month |
| Finished goods in stock, on average | | one month |
| Credit allowed to debtors is | | one month |
| Credit allowed by creditors is | | one month |
| Lag in payment of wages is | | two weeks |

One fourth of the output is sold for cash. Cash in hand is ` 80,000.

*Sol :*

**Statement showing changes in working capital**

| Particulars | Amount |
|---|---|
| **Current assets** | |
| Stock of Rawmaterials for 1 month $\left(1,20,000 \times 45 \times \frac{4}{52}\right)$ | 4,15,385 |
| **Work-in-progress for 1 month** | |
| (a) Materials $\left(1,20,000 \times 45 \times \frac{4}{52}\right)$ | 4,15,385 |
| (b) Labour $\left(1,20,000 \times 22 \times \frac{4}{52}\right)$ | 2,03,077 |
| (c) Overheads $\left(1,20,000 \times 13 \times \frac{4}{52}\right)$ | 1,20,000 |
| Finished goods $\left(1,20,000 \times 80 \times \frac{4}{52}\right)$ | 7,38,462 |
| Debtors for one month $\left(90,000 \times 80 \times \frac{4}{52}\right)$ | 5,53,846 |
| Cash in hand | 80,000 |
| Total Current Assets (A) | 25,26,155 |
| **Current liabilities** | |
| Creditors on average on month $\left(1,20,000 \times 45 \times \frac{4}{52}\right)$ | 4,15,385 |

| | |
|---|---|
| Lag in payment of wages $\left(1,20,000 \times 22 \times \frac{2}{52}\right)$ | 1,01,538 |
| Total current liabilities (B) | 5,16,923 |
| Working capital (A – B) | 20,09,232 |

10. Prepare cash budget for the three months starting from March 2019.

| Month | Sales (`) | Purchases (`) | Wages (`) |
|---|---|---|---|
| January, 2019 | 3,20,000 | 2,60,000 | 40,000 |
| February, 2019 | 3,34,000 | 2,52,000 | 42,000 |
| March, 2019 | 2,92,000 | 3,46,000 | 38,000 |
| April, 2019 | 3,66,000 | 4,06,000 | 34,000 |
| May, 2019 | 2,22,000 | 4,28,600 | 30,000 |

(a) 25 percent of the sales is on cash. 50 percent of the credit sales is realized in the month following sales and the remaining 50 percent of the credit sales in the second month following.

(b) Creditors are paid in the month following the month of purchase.

(c) Estimated cash at bank as on I[st] March, 2019 is ` 80,000.

*Ans :*

Cash budget for 3 month March 19 to May 19

| Particulars | March | April | May |
|---|---|---|---|
| **Receipts** | | | |
| Opening balance | 80,000 | 1,08,250 | 54,500 |
| Cash from sales | 73,000 | 91,500 | 55,500 |
| | (25% of 2,92,000) | (25% of 3,66,000) | (25% of 2,22,000) |
| Cash collection from debtors | 2,45,250 | 2,34,750 | 2,46,750 |
| (A) | 3,98,250 | 4,34,500 | 3,56,750 |
| **Payments** | | | |
| Payments creditors | 2,52,000 | 3,46,000 | 4,06,000 |
| Wages | 38,000 | 34,000 | 30,000 |
| (B) | 2,90,000 | 3,80,000 | 4,36,000 |
| Balance (A – B) | 1,08,250 | 54,500 | (79,250) |

OR

11. Discuss the techniques of cash management. **(Unit-V, Q.No.10)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R17**

**M.B.A II - Semester Examination**

**December - 2018**

## FINANCIAL MANAGEMENT

Time : 2 Hours] [Max. Marks : 75

**Note:** This question paper contains two parts A and B.

**Part A** is compulsory which carries 25 marks. Answer all questions in Part A.

**Part B** consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

### PART - A (5 × 5 = 25 Marks)

**ANSWERS**

1. Answer the following in about five sentences each :

(a) Future Value and Present value. **(Unit-I, Q.No.19)**

(b) What is IRR ? How is it different from NPV ? **(Unit-II, SQA-7,8)**

(c) State MM hypothesis. **(Unit-III, Q.No.29)**

(d) Cash credit. **(Unit-IV, Q.No.10)**

(e) What are the objectives of effective cash management ? **(Unit-V, Q.No.2)**

### PART - B (5 × 10 = 50 Marks)

2. Define 'financial management'. Discuss the scope of financial management. **(Unit-I, Q.No.1,2)**

OR

3. Explain the stages and steps involved in the modem approaches to Financial Management. **(Unit-I, Q.No.4)**

4. Explain the various relevant Costs in the Cost of Capital and their measurement. **(Unit-II, Q.No.21,27,28,29,30)**

OR

5. The expected cash flows of a project are as follow:

| Years | Cash flow |
|---|---|
| 0 | (–1,00,000) |
| 1 | 30,000 |
| 2 | 40,000 |
| 3 | 50,000 |
| 4 | 60,000 |
| 5 | 70,000 |

The cost of capital is 12 percent. Calculate the following:

(a) Payback period

(b) Net Present Value.

*Ans :*

(i) Calculation of payback period

| Year | Cashflow | Cumulative Cashflow |
|---|---|---|
| 1 | 30,000 | 30,000 |
| 2 | 40,000 | 70,000 |
| 3 | 50,000 | 1,20,000 |
| 4 | 60,000 | 1,80,000 |
| 5 | 70,000 | 2,50,000 |

$$\text{Payback period} = 2 \text{ years} + \frac{30,000}{50,000}$$

$$2 + 0.6 = 2.6 \text{ years}$$

(ii) Calculation of NPV

| Year | Cashflow | PV factor @ 12% | PVCF |
|---|---|---|---|
| 1 | 30,000 | 0.893 | 26,790 |
| 2 | 40,000 | 0.797 | 31,880 |
| 3 | 50,000 | 0.712 | 35,600 |
| 4 | 60,000 | 0.635 | 38,100 |
| 5 | 70,000 | 0.567 | 39,690 |
| | | | 1,72,060 |

NPV = Cash in flow – Cash out flow

1,72,060 – 1,00,000

= 72,060

6. Explain the three approaches for designing and determining a Firm's Capital Structure, with suitable example illustrations for each approach. **(Unit-III, Q.No.22,23,24)**

OR

7. Explain the determinants of dividend policy in a fast growing company. Should there be a dividend freeze? **(Unit-III, Q.No.30)**

8. What do you mean by Working Capital? What are the various sources of working capital financing available to business organizations ? Explain in detail. **(Unit-IV, Q.No.1,2)**

OR

9. The turnover of Manjunatha Ltd. is ` 60 lakhs of which 80% is on credit. Debtors are allowed one month to clear off the dues. A factor is willing to advance 90% of the bills raised on credit for a fee of 2 % a month plus a commission of 4% on the total amount of debts. Manjunatha Ltd. as a result of this arrangement is likely to save ` 21,600 annually in management costs and avoid bad debts at 3% on the credit sales. A bank has come forward to make an advance equal to 90% of the debts at an annual interest rate of 20%. However, its processing fee will be at 3% on the debts. Suggest whether you would accept factoring or the after from the bank ?

*Ans :*

**Bill discounting (Alternative – I)**

Average debtors – 4,00,000 P.M

| | | |
|---|---|---|
| Processing fee 4,00,000 × 3% | – | 12,000 |
| Interest $\left(4,00,000 \times 90\% \times 20\% \times \frac{1}{12}\right)$ | – | 6,000 |
| Loss due to bad debts PM | – | 4,000 |
| Admission cost | – | 1,800 |
| | | 23,800 |

**Factoring (Alternative - II)**

Calculation of effective cost of factoring :

Sales for the year = 60,00,000

Credit sales = 48,00,000

Receivable $\left(\frac{48,00,000}{12} \times 1\right)$ = 4,00,000

Cost of factoring (per month)

| | | | |
|---|---|---|---|
| Fee(interest) | 4,00,000 × 90% × 12% | – | 7,200 |
| Commission | 4,00,000 × 4% | – | 16,000 |
| Cost per month | | | 23,200 |
| (–) Saving | | | |
| Management cost $\left(\frac{21,600}{12}\right)$ | | | (1800) |
| Bad debts | (4,00,000 × 3%) | | (12000) |
| Cost of factoring | | | 9400 |

10. Explain the inventory management process. **(Unit-V, Q.No.29)**

OR

11. Differentiate ‘Mergers’ from ‘Acquisitions’ and ‘Take overs’. How can Merger proposals’ be evaluated ? **(Unit-V, Q.No.35,42,43)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R17**

**M.B.A II - Semester Examination**

**June / July - 2018**

## FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**PART - A (5 × 5 = 25 Marks)**
**[Short Answer type]**

**ANSWERS**

1. (a) "An agency relationship is a fiduciary relationship." Comment. **(Unit-I, SQA-6)**

   (b) Difference between NPV and IRR. **(Unit-II, SQA-8)**

   (c) Write about Gordon Model with assumption **(Unit-III, SQA-9)**

   (d) Prepare working capital format with its components **(Unit-IV, Prob.3)**

   (e) Write about Net Assets Method of merger. **(Unit-V, Q.No.40)**

**PART - B (5 × 10 = 50 Marks)**
**[Essay Answer type]**

2. In December 2015, ZTECH stock had a beta of 0.95. The Treasury rate at the time was 5%, and the treasury bond rate was 6%. The firm had debt outstanding of Rs.1.7 crore and a market value of equity of Rs.1.5 crore; the corporate marginal tax rate was 40%.

   (a) Estimate the expected return on the stock for a short term investor in the company.

   (b) Estimate the expected return on the stock for a long term investor in the company **(Unit-I, Prob.8)**

OR

3. Discuss the major techniques of calculating TVM. If you want a Rs.10,00,000 for retirement in 30 years, how much would you have to save by the end of each year if you could make 12% per year? How much would you have to set aside each year if you could put money away starting now? **(Unit-I, Q.No.19, Prob.4)**

OR

4. (a) A company raised preference share capital of Rs.10,00,000 by the issue of 10% preference share of Rs.10 each. Find out the cost of preference share capital when it is issued at (i) 10% premium, and (ii) 10% discount. **(Unit-II, Prob.22)**

   (b) The entire share capital of a company consist of 1,00,000 equity share of Rs. 100 each. Its current earnings are Rs.10,00,000 p.a. The company wants to raise additional funds of Rs.25,00,000 by issuing new shares. The flotation cost is expected to be 10% of the face value. Find out the cost of equity capital given that the earnings are expected to remain same for coming years. **(Unit - II, Prob. 23)**

5. Discuss the techniques of calculating cost of capital of a firm. A company issues 10% Debentures for Rs.2,00,000 Rate of tax is 40%. Calculate the cost of debt (after tax) if the debentures are issued (a) at par (b) at a discount of 10% and (c) at a premium of 10%. **(Unit-II, Q.No.27, Prob.24)**

6. Techno Manpower Ltd. expecting EBIT of Rs. 5,00,000 per annum on investment of Rs.10,00,000. Company is in need of Rs.8,00,000 for its expansion activities. Company can raise this amount by either equity shares capital or 12% preference share capital or 10% debentures. The company is considering the following financing patterns. :

   (a) 10,00,000 through issues of Equity Shares at par;

   (b) 5,00,000 by issue of Equity Share Capital and remaining 5,00,000 by issue of debentures;

   (c) 5,00,000 through Equity Shares and 2,50,000 through 12% Preference Share Capital and remaining 2,50,000 through 10% debentures.

   (d) 5,00,000 through debt and 2,50,000 through Equity Shares and remaining 2,50,000 through 12% preference Share Capital.

   Find out the best financing mix assuming 50% tax rate. **(Unit - III, Prob. 10)**

OR

7. Discuss about Walters Model. A company has an EPS of Rs.15. The market rate of discount applicable to the company is 12.5%. Retained earnings can be reinvested at IRR of 10%. The company is paying out Rs.5 as a dividend. Calculate the market price of the share using Walter's **(Unit-III, Q.No.27, Prob.18)**

8. Write Short notes on :

   (a) Net Working Capital and Gross Working Capital **(Unit - IV, Q.No.5)**

   (b) Financing of working capital **(Unit - IV, Q.No.10)**

OR

9. You are supplied with the following information in respect of XYZ Ltd., for the ensuring year : Production of the year, 69,000 units.

   Finished goods in store, 3 months

   Raw material in store, 3 months

   Raw material in store, 2 months

   Consumption Production process 1 month

   Credit allowed by creditors, 2 months

   Credit given to debtors, 3 months

   Selling price per unit, Rs.50

   Raw material, 50 percent of selling price

   Direct wages, 10 percent of selling price

   Manufacturing and Administrative overheads, 16 per cent of selling price

   Selling overheads 4 percent of selling price

There is a regular production an sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. You are required to ascertain its working capital requirement. **(Unit - IV, Prob. 6)**

10. (a) Why do we prepare cash budget ? Draw its specimen. **(Unit - V, Q.No. 6, 9)**

    (b) Discuss the role of factors in credit management system. **(Unit - V, Q.No. 19)**

OR

11. (a) Differentiate between merger and acquisition with examples. **(Unit - V, Q.No. 46)**

    (b) What is purchase consideration? Also discuss about Net Purchase Method. **(Unit - V, Q.No. 45)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R15**

**MBA - II Semester Examinations**

**February - 2017**

## FINANCIAL MANAGEMENT

Time : 3 Hours ] [Max. Marks : 75

**Note:** Answer any five questions
All questions carry equal marks.

**PART - A (5 × 5 = 25 Marks)**

**ANSWERS**

1. a) Define 'financial management'? Explain finance function. **(Unit-I, Q.No.1,5)**

   b) Explain the nature and concept of capital Budgeting? **(Unit-II, Q.No.1)**

   c) Define financial leverage? Explain the type of leverages. **(Unit-II, Q.No.10,12)**

   d) Explain the factors that influence the dividend policy of a company. **(Unit-III, Q.No.30)**

   e) What is the importance of cash budget? Explain preparation of cash budget. **(Unit-V, Q.No.6,8)**

**PART - B (5 × 10 = 50 Marks)**

2. "The profit maximization is not an operationally feasible criterion". Do you agree? Illustrate your answer with suitable numerical examples. **(Unit-I, Q.No.8)**

OR

3. Explain the mechanics of calculating the present value and future value of cash flows. **(Unit-II, Q.No.19)**

4. What are the steps involved in calculating a firms WACC? **(Unit-III, Q.No.33)**

OR

5. A company is considering an investment proposal to install new machine. The project will cost Rs. 50,000 and will have life and no salvage value. Tax rate is 50% the company follows straight method of depreciation. The net earnings before depreciation and tax is follows.

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| EBDT (Rs.) | 10,000 | 11,000 | 14,000 | 15,000 | 25,000 |

Evaluate the project by using

a) PBP b) ARR c) NPV @ 10%

d) IRR e) PI @ 10%

*Sol :*

| Year | EBDT | - Dep = | EBT | – Tax = | PAT | + Dep = | CFAT |
|---|---|---|---|---|---|---|---|
| 1 | 10,000 | 10,000 | 0 | – | – | 10,000 | 10,000 |
| 2 | 11,000 | 10,000 | 1000 | 500 | 500 | 10,000 | 10,500 |
| 3 | 14,000 | 10,000 | 4,000 | 2000 | 2000 | 10,000 | 12,000 |
| 4 | 15,000 | 10,000 | 5,000 | 2,500 | 2,500 | 10,000 | 12,500 |
| 5 | 25,000 | 10,000 | 15,000 | 7,500 | 7,500 | 10,000 | 17,500 |

| Year | CFAT | Cumulative CFAT | Pv @ 10% | Pv of CFAT |
|---|---|---|---|---|
| 1 | 10,000 | 10,000 | 0.909 | 9090 |
| 2 | 10,500 | 20,500 | 0.826 | 8673 |
| 3 | 12,000 | 35,500 | 0.751 | 9012 |
| 4 | 12,500 | 45,000 | 0.683 | 8538 |
| 5 | 17,500 | 62,500 | 0.621 | 10,868 |
| | | | | 46,181 |

$$\text{Payback period} = \text{Base year} + \frac{\text{Required CFAT}}{\text{Next year CFAT}}$$

$$= 4 + \frac{5000}{17,500} = 4.29 \text{ yars}$$

$$\text{Accounting rate of return} = \frac{\text{Average PAT}}{\text{Average Investment}}$$

$$\text{Average PAT} = \frac{\text{Total PAT}}{\text{No. of years}} = \frac{12,500}{5} = 25,000$$

$$\text{ARR} = \frac{2500}{25,000} \times 100 = 10\%$$

$\text{NPV} = \Sigma\text{Pv of CFAT} - \text{Pv of cash outlay}$

$= 46181 - 5000$

$\text{NPV} = (3819)$

$$\text{Profitability index} = \frac{\Sigma\text{Pv of CFAT}}{\text{Pv of cash outlay}} = \frac{46181}{50,000} = 0.9$$

**IRR :**

In the given problem, cash flows are unequal,

$$\text{Fake annuity} = \frac{\text{Total CFAT}}{\text{No. of years}} = \frac{67,500}{5} = 13,500$$

$$\text{Fake PBP} = \frac{\text{Initial investment}}{\text{Fake annuity}} = \frac{50,000}{13,500} = 3.70$$

The discounting factor located in Pv of annunity of Rs. 1 table which is nearest to the fake PBP in the year of project life time is 3.696 @ 11%. Hence use these % as trial rate to findout Pv of CFAT.

| Year | CFAT | Pv@ 11% | Pv of CFAT | Pv @ 8% | Pv of CFAT | Pv@6% | Pv of CFAT |
|---|---|---|---|---|---|---|---|
| 1 | 10,000 | 0.901 | 9010 | 0.926 | 9260 | 0.943 | 9430 |
| 2 | 10,500 | 0.812 | 8526 | 0.857 | 8999 | 0.89 | 9345 |
| 3 | 12,000 | 0.731 | 8772 | 0.794 | 9528 | 0.84 | 10,080 |
| 4 | 12,500 | 0.656 | 82000 | 0.735 | 9188 | 0.823 | 10,288 |
| 5 | 17,500 | 0.593 | 10378 | 0.681 | 11,918 | 0.747 | 13,073 |
| | | | 44886 | | 48,893 | | 52216 |

$$\text{IRR} = 6\% + \frac{52,216 - 50,000}{52,216 - 48,893} \times (8 - 6)$$

$$= 6\% + \frac{2216}{3323} \times 2$$

$$= 6\% + 1.34$$

$$\text{IRR} = 7.34\%$$

6. Brief explain the factors that influence the planning of the capital structure in practice. **(Unit-III, Q.No.1)**

7. Firm A and B are similar expect that A is unlevered, while B has Rs. 2,00,000 of 5% debenture outstanding. Assume that the tax rate is 40%. NOI is Rs. 40,000 and the cost of the equity is 10%.

   a) Calculate the value of the firms, if the M-M assumptions are met.

   b) Suppose VB = Rs. 3,60,000. According to MM, do these represent equilibrium values? How will equilibrum be set? Explain.

*Sol:*

$$\text{Value of unleved from (A)} = \frac{\text{Earrings before interest tax}}{\text{Overall cost of capital}}$$

$$= \frac{EBIT}{K_0}(1-t)$$

$$= \frac{40,000}{0.1}(1-0.4)$$

$$= \frac{40,000}{0.1} \times 0.6$$

$$V_A = 2,40,000$$

Value of firm B which has debt financing of 2,00,000

$$V_B = V_A + t_d$$
$$= 2,40,000 + 2,00,000 \times 0.8$$
$$= 2,40,000 + 80,000$$
$$V_B = 3,20,000$$

8. What are the features of Walter's and Gordon's dividend model? Illustrate with suitable example. **(Unit-III, Q.No.27,28)**

OR

9. Lathika Ltd has a capital structure shown below.

| Particulars | Rs. Core |
|---|---|
| Equity share capital (Rs. 10 par, 6 Crore shares) | 60 |
| Preference share capital (Rs. 100 par, 50 lakh shares) | 50 |
| Share premium | 50 |
| Reserve and surpluses | 80 |
| Net worth | 240 |

Show the changed capital structure if the company declares a bonus issue of shares in the ratio of 1 : 5 to ordinary share holders when the issue price per share is Rs. 100. How would the capital structure be affected if the company had split its stock five-for-one instead of declaring bonus issue?

*Sol :*

If the company declares bones shares in the ratio of 1 : 5, the shareholder will get 30 crore shares. The company's out standing shares will increases by 24 crores making the total outstanding shares as 30 crores. The share holders stake in the company before bones issue was, $\frac{6\,\text{crores}}{60\,\text{crores}} = 0.1$ & after the bonus issue = $\frac{30\,\text{crores}}{300\,\text{crores}} = 0.1$ the percentage holding of the existing shareholders remains the same.

But is case of stock split, when the company decrease the face value of its outstanding shares & increase the number by same proportion, in case of 5 : 1 stock split, the outstanding shares will becomes 5 times the existing, while the face value will become 1/5th of the existing. A bonus issue increase the share capital & decreases the reserves of a company by the same amount, but a stock split changes neither of these. The primary purpose of the stock split is to increase the liquidity of the company's stock so that more number of retail investors can participate.

10. Write a note on Recommendations of Tandon and Daheja Committee on Working Capital management? **(Unit-III, Q.No.13)**

OR

11. While preparing a project report on behalf of a client you have collected the following information. Estimate the working capital required (for the level of activity 1,50,000 units) for the firm after adding 10 percent contingency. You may assume that production is carried on evenly throughout the year and wages and overhead expenses accrue similarly.

| **Cost per unit** | **(Rs.)** |
|---|---|
| Raw materials | 38.5 |
| Direct labour | 11.8 |
| Overheads (including depreciation Rs. 5) | 32.0 |
| Total cost | 82.3 |
| Profit | 17.7 |
| Selling price | 100 |

Additional Information

Average raw materials in stock: four weeks; average materials-in-process (RMs 100% and remaining 50 percent completion stage). Half of month; average finished goods in stock; four weeks; credit allowed by suppliers; one month; credit allowed to debtors; eight weeks; lag in payment of wages; two weeks; Cash at bank is expected to be Rs. 1,00,000. All sales are credit sales.

*Sol :*

**Statement showing Estimation of Working Capital Requirement**

| **Particulars** | **Amount** | **Amount** |
|---|---|---|
| Current Assets | | |
| Stock | | |
| Raw material (1,50,000 × 38.5 × 4/52) | 4,44,230 | |
| Work-in-progress | | |
| Raw material $\left(1,50,000 \times 38.5 \times \frac{0.5}{12}\right)$ | 2,40,625 | |
| Direct labour $\left(1,50,000 \times 11.8 \times \frac{0.5}{12} \times 50\%\right)$ | 36,875 | |
| Overheads $\left(1,50,000 \times 27 \times \frac{0.5}{12} \times 50\%\right)$ | 84,375 | |
| Finished goods $\left(82.3 \times 1,50,000 \times \frac{9}{52}\right)$ | 9,49,577 | 17,55,682 |

| | | |
|---|---|---|
| Debtors $\left(1,50,000 \times 82.3 \times \frac{8}{52}\right)$ | | 18,99,237 |
| Cash | | 1,00,000 |
| Total current assets (1) | | 37,54,919 |
| Current Liabilities | | |
| Creditors $\left(1,50,000 \times 38.5 \times \frac{1}{12}\right)$ | 4,81,250 | 4,81,250 |
| Outstand express $\left(1,50,000 \times 11.8 \times \frac{2}{52}\right)$ | 68,074 | 68,074 |
| Total current liabilities (2) | | 5,49,324 |
| Working capital = TCA – TCL | | 32,05,595 |
| = 1 – 2 | | |
| (+) Contigencis ( × 10%) | | 3,20,560 |
| Net working capital | | 35,26,155 |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**R15**

## MBA - II Semester Examinations

**August/September - 2016**

## FINANCIAL MANAGEMENT

Time : 3 Hours ] [Max. Marks : 75

**Note :** Answer any five questions

All questions carry equal marks.

### PART - A (5 × 5 = 25 Marks)

**ANSWERS**

1. Explain clearly the following :

a) Time Value of Money **(Unit-I, SQA-8)**

b) Capital Budgeting **(Unit-II, SQA-1)**

c) Capital Structure Vs Financial Structure **(Unit-III, Q.No.4)**

d) Bonus Shares **(Unit-IV, Q.No.35)**

e) Inventory Management **(Unit-V, Q.No.26)**

### PART - B (5 × 10 = 50 Marks)

2. Explain in detail the Goals of Finance Function. **(Unit-I, Q.No.7)**

OR

3. (a) You have invested Rs. 2000 at the end of first year, Rs. 3000 at the end of second year and Rs. 5000 each year from third to fifth years. Find the present value of these cash flows at a discount rate of 10%.

*Ans :*

| Year | Cash flows | PV @ 10% | PV of CFAT |
|---|---|---|---|
| 1 | 2000 | 0.909 | 1818 |
| 2 | 3000 | 0.826 | 2478 |
| 3 | 5000 | 0.751 | 3755 |
| 4 | 5000 | 0.683 | 3415 |
| 5 | 5000 | 0.621 | 3105 |
| Preset value of cashflows | | | 14,571 |

(b) You have paid in lump sum an amount of Rs. 2,00,000/- towards the repayment of a loan of Rs. 1,50,000/- taken by you 5 years back. What is the implied rate of Interest ?

*Ans :*

Principle amount = 1,50,000

No. of years for loan taken - 5 yrs

Total repayment amount = 2,00,000

Interest amount paid = 2,00,000 – 1,00,000

= 50,000

Simple interest = Principal amount × Interest × No. of years

50,000 = 1,50,000 × I × 5

50,000 = 7,50,000 × I

$$I = \frac{50,000}{7,50,000}$$

= 6.67%

Interest per annum = 6.67%

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4. Aparna Home Appliances ltd. has the following capital structure.

(Amount in lakhs of Rupees)

| Components of Capital | Amount |
|---|---|
| Equity shares (10 lakh shares at par value) | 100 |
| 12% preference shares (10,000 shares at par value) | 10 |
| Retained earnings | 120 |
| 14% Non-convertible debentures(70,000 debentures at par value) | 70 |
| 14% Term Loan from APSFC | 100 |
| Total 400 | |

Additional Information :

a) The Market price per equity is Rs. 25. The next expected dividend per shares (DPS) is Rs. 2 and the DPS is expected to grow at a constant rate of 8%.

b) The preference shares are redeemable after 7 years at par and are currently quoted at Rs. 75 per share on the stock exchange.

c) The debentures are redeemable after 6 years at par and their current market rate is Rs. 90 per debenture.

d) The tax rate applicable to the firm is 50%.

Calculate the weighted average cost of capital (Using the Book value approach for determining the weights associated with the various sources of finance)

*Sol :*

Cost of equity ($K_e$) = $\frac{D}{MP} + G$

$= \frac{2}{25} + 8\%$

= 8% + 8%

$K_e$ = 16%

$$K_p = \frac{D_p + \frac{(P_n - P)}{n}}{\frac{P_n + P}{2}} = \frac{12 + \frac{75 - 100}{7}}{\frac{75 + 100}{2}}$$

$$= \frac{8.43}{87.5} = 0.096$$

$K_p$ = 10%

$$K_f = \frac{I(1-t) + \frac{Rv - Sp}{n}}{\frac{Rv + Sp}{2}} = \frac{14(1-0.5) + \frac{90-100}{6}}{\frac{90+100}{2}}$$

$$= \frac{5.34}{95} = 0.056$$

$K_d$ = 0.056 = 6%

$K_d$ = 6%

Calculation of weighted average cost of capital

| Source | Amount | Weight | Specific cost | WACC = $\Sigma W_i \times X_i$ |
|---|---|---|---|---|
| Equity capital | 10,00,00,000 | 0.25 | 16 | 4 |
| Preference capital | 1,00,000 | 0.025 | 10 | 0.25 |
| Debentures | 70,00,000 | 0.175 | 6 | 1.05 |
| Loan | 10,00,00,000 | 0.25 | 14 | 3.5 |
| Retained earnings | 1,20,00,000 | 0.3 | 16 | 4.8 |
| | 40,00,00,000 | | | WACC = 13.6% |

OR

5. Calculated the NPV and IRR of a project, the cash flows of which are as follows.

(Amount in lakhs of Rupees)

| Years | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Investment | 80 | | | | | |
| Cash flows | | 30 | 40 | 50 | 30 | 10 |

Additional Information :

a) The cost of capital is 10%

b) Salvage value at the end of 5th year is zero.

*Sol :*

Calculation of NPV & IRR

**Calculation of NPV**

| Year | Cash of flows | Pv @ 10% | Pv of CFAT |
|---|---|---|---|
| 0 | (80) | 1 | (80) |
| 1 | 30 | 0.909 | 27.27 |
| 2 | 40 | 0.826 | 33.04 |
| 3 | 50 | 0.751 | 37.55 |
| 4 | 30 | 0.683 | 20.49 |
| 5 | 10 | 0.621 | 6.21 |

NPV = Pv of cash inflows - Pv of cash outlay

= (27.27 + 33.04 + 37.55 + 20.49 + 6.21) – 80

= 124.56 – 80

NPV = 44.56

**Calculation of IRR**

In the given problem, cash flow are unequal,

$$\text{Fake PBP} = \frac{\text{Initial investment}}{\text{Fake annuity}}$$

$$\text{Fake annuity} = \frac{\text{Total CFAT}}{\text{No. of years}}$$

$$= \frac{30+40+50+30+10}{5} = \frac{160}{5} = 32$$

$$\text{Fake PBP} = \frac{80}{32} = 2.5$$

Since the discounting factor located in Pv in annunity of Rs. 1 table which is nearest to the fake PBP is the year of project life time is 2.532 @ 28%. Hence use this as % to calculate Pv of CFAT.

| Year | CFAT | Pv@ 28% | Pv of CFAT |
|---|---|---|---|
| 1 | 30 | 0.781 | 23.43 |
| 2 | 40 | 0.610 | 24.4 |
| 3 | 50 | 0.477 | 23.85 |
| 4 | 30 | 0.373 | 11.19 |
| 5 | 10 | 0.291 | 2.91 |
| | | | 85.78 |

| Year | CFAT | Pv@ 32% | Pv of CFAT |
|---|---|---|---|
| 1 | 30 | 0.758 | 22.74 |
| 2 | 40 | 0.574 | 22.96 |
| 3 | 50 | 0.435 | 21.75 |
| 4 | 30 | 0.329 | 9.87 |
| 5 | 10 | 0.250 | 2.5 |
| | | Pv of CFAT | 79.82 |

$$I_{RR} = L_R + \frac{\text{Pv of CFAT}_{LR} - \text{Pv of cash outlay}}{\Delta\,\text{Pv of CFAT}} \times (h_r - L_r)$$

$$= 28 + \frac{85.78 - 80}{85.78 - 79.82} \times (32 - 28)$$

$$= 28 + \frac{5.78}{5.96}\,(4)$$

IRR = 31.88%

6. The total sales of a company are Rs. 7,00,000. Unit selling price is R.s 10 and variable cost per unit is Rs. 7. Total Fixed costs amount to Rs. 1,70,000. The company finances its assets to an extent of 50% by debt, and the interest on the debt amounts to Rs. 20,000. The applicable tax rate for the company is 35%.

   Calculate the Financial, Operating and combined Leverage of the company.

*Ans :*

Sales = 7,00,000

SPU = 10

VCPU = 7

Fixed cost = 1,70,000

Tax rate = 35%

Interest on debt amount = 20,000

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

Calculated of operating leverage, financial leverage & combined leverage.

| Particulars | Amount |
|---|---|
| Sales | 7,00,000 |
| (–) Variable cost (70,000 × 7) | 4,90,000 |
| Contribution | 2,10,000 |
| (–) Fixed cost | 1,70,000 |
| EBIT | 40,000 |
| (–) Interest | 20,000 |
| EBT | 20,000 |
| (–) Tax (35%) | 7000 |
| PAT | 13,000 |

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{2,10,000}{40,000} = 5.25$$

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT}} = \frac{40,000}{20,000} = 2$$

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{2,10,000}{20,000} = 10.5$$

---

7. The EBIT of firm A is Rs. 2,25,000. Interest on debt in respect of firm A is Rs. 75,000 (@ 15% PA), EBIT of firm B is also Rs. 2,25,000. Equity Capitalisation rate and Tax rates are 20% and 35% respectively, for both the firms.

Which of the two firms has optimal capital structure under Net Operating Income approach ?

*Sol :*

EBIT of firm A = 2,25,000

Interest on debt of firm A = 75,000 (@ 15% p.a)

EBIT of firm B = 2,25,000

Equity capitalisation rate = 20%

Tax rate = 35%

According to net operating income approach :

$$\text{Value of the firm} \quad A = \frac{\text{EBIT}}{K_0}$$

$$V = \frac{2,25,000}{K_0}$$

$$K_e = \frac{E_e}{E}$$

$$= \frac{EBIT - I}{V - D} = \frac{2,25,000 - 11,250}{V - 75,000}$$

$$20 = \frac{2,13,750}{V - 75,000}$$

$$0.2(V - 75,000) = 2,13,750$$

$$0.2\ V - 15,000 = 2,13,750$$

$$0.2\ V = 2,13,750 + 15,000$$

$$V = \frac{2,28,750}{0.2} = 11,43,750$$

$$V = \frac{2,25,000}{11,43,750} = 0.197 \times 100$$

$$K_e = 19.7\%\ \text{or}\ 20\%$$

from B :

$$V = \frac{EBIT}{K_0}$$

$$K_e = \frac{EBIT - I}{V - D} = 0.2 = \frac{2,25,000}{V}$$

$$V = \frac{2,25,000}{0.2} = 11,25,000$$

$$11,25,000 = \frac{2,25,000}{K_0}$$

$$K_0 = \frac{2,25,000}{11,25,000} = 0.2$$

$$K_0 = 20\%$$

Both the firm are having same cost of capital of 20%

8. Explain the procedure of Dividend declaration and payment. **(Unit-III, Q.No.34)**

OR

9. The Equity capitalisation rate is 11%. Earnings per share is Rs. 20/. Determine the values of the shares as per Gordon's Model, under conditions of certainty,

when the rates of return on investment are 12%, 11% and 10%, assuming the following :

a) 90% Retention

b) 80% Retention and

c) 50% Retention

*Ans :*

EPS = 20

$K_e$ = 11%

Return on investment = 12%

$r_1$ = 12%, $r_2$ = 11%, $r_3$ = 10%

**(a) 90% Retention**

1 – b = 0.9, b = 0.1, EPS = 20, $r_1$ = 12%

$$P = \frac{E(1-b)}{K_e - br}$$

$$= \frac{20(0.9)}{0.11-(0.1)(0.12)}$$

$$= \frac{18}{0.098} = \text{Rs. } 184$$

**(b) 80% Retention**

1 – b = 0.8, b = 0.2, EPS = 20, $r_1$ = 12

$$P = \frac{20(0.8)}{0.11-(0.2)(0.12)} = \frac{16}{0.086} = \text{Rs. } 186$$

**(c) 90% Retention**

1 – b = 0.5, b = 0.5, EPS = 20, $r_1$ = 12

$$P = \frac{20(0.5)}{0.11-(0.5)(0.12)} = \frac{10}{0.05} = \text{Rs. } 200$$

Return on investment = 11%

$$P = \frac{20(0.9)}{0.11-(0.1)(0.11)} = \frac{18}{0.099} = \text{Rs. } 181.82$$

$$P = \frac{20(0.8)}{0.11-(0.2)(0.11)} = \frac{16}{0.088} = \text{Rs. } 181.82$$

$$P = \frac{20(0.5)}{0.11-(0.5)(0.11)} = \frac{10}{0.055} = \text{Rs. } 181.82$$

Return on investment = 10%

$$P = \frac{20(0.9)}{0.11-(0.1)(0.1)} = \frac{18}{0.1} = \text{Rs. } 180$$

$$P = \frac{20(0.8)}{0.11-(0.2)(0.1)} = \frac{16}{0.09} = \text{Rs. } 177.77$$

$$P = \frac{20(0.5)}{0.11-(0.5)(0.1)} = \frac{10}{0.06} = \text{Rs. } 166.67$$

10. Define the terms "Gross Working Capital, Net Working Capital, Working Capital Gap" and explain the importance of current assets management in working capital planning. **(Unit-IV, Q.No.2,3)**

OR

11. State the important recommendations of Tandon committee, Daheja committee recommendations on working capital finance. **(Unit-IV, Q.No.13)**

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**M.B.A II - Semester Examination**

**R19**

**Model Paper - I**

# FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**Note :** This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A (5 × 5 = 25 Marks)**
**[Short Answer type]**

**ANSWERS**

1. (a) Explain the goals of finance functions. **(Unit-I, SQA-4)**
   (b) Explain the significant of capital budgeting to a firm. **(Unit-II, SQA-2)**
   (c) What are the assumptions of capital structure. **(Unit-III, SQA-6)**
   (d) Explain the components of working capital. **(Unit-IV, SQA-2)**
   (e) Characteristics of Marketable Securities. **(Unit-V, SQA-4)**

**PART - B (5 × 10 = 50 Marks)**

**[Essay Answer type]**

2. Define financial management. Explain the nature and scope of financial management. **(Unit - I, Q.No.2)**

OR

3. You have invested ` 2,000 at the end of first year, ` 3,000 at the end of second year and ` 5,000 each year from third to fifth years. Find the present value of these cash flows at a discount rate of 10%. **(Unit-I, Prob.6)**

4. Phoenix Company is considering two mutually exclusive investments. Project P and Project Q. The expected cash flows of these projects in millions of rupees are as follows,

| Year | Project P | Project Q |
|---|---|---|
| 0 | (1000) | (1600) |
| 1 | (1000) | 200 |
| 2 | (500) | 400 |
| 3 | (250) | 600 |
| 4 | 2000 | 800 |
| 5 | 4000 | 200 |

(a) What is the IRR for each project?

(b) Which project would you choose if the cost of capital is (i) 10%? (ii) 20%? **(Unit-II, Prob.13)**

OR

5. How do you measures Cost of Retained Earnings ? **(Unit-II, Q.No.31)**

6. A Steel Company has an EBIT of ` 1,50,000. Its Capital Structure is as follows:

| Particulars | ` |
|---|---|
| 10% Bonds | 4,00,000 |
| 12% Preference Capital | 2,00,000 |
| Equity Capital (FV : ` 100) | 4,00,000 |

Note : The Co. is in 35% Tax bracket.

Find : (a) The EPS of the firm

(b) The % change in EPS associated with 20% increase in EBIT. **(Unit-III, Prob.12)**

OR

7. The equity capitalization rate is 11%. Earnings per share is ` 20/- Determine the values of the shares as per Gordon's Model, under conditions of certainty, when the rates of return on investment are 12% 11% and 10%, assuming the following

(a) 90% Retention

(b) 80% Retention and

(c) 50% Retention **(Unit-III, Prob.20)**

8. Differences between Gross Vs Net Working Capital. **(Unit-IV, Q.No.5)**

OR

9. Determine the working required to finance a level of activity of 1,80,000 units of output for a year. The cost structure is as under :

| Particulars | Cost per unit (Rs.) |
|---|---|
| Raw Materials | 20 |
| Direct Labour | 5 |
| Overheads (including depreciation of Rs. 5) | 15 |
| Total cost | 40 |
| Profit | 10 |
| Selling Price | 50 |

Additional Information :

- Minimum desired cash balance is Rs. 20,000
- Raw materials are held in stock, on an average, for 2 months
- Work-in-progress (assume 50 per cent completion stage) will approximate to half-a-month production

- Finished goods remain in warehouse, on an average for a month
- Suppliers for materials extend a month's credit and debtors are provided 2 months credit. The cash sales are 25 per cent of total sales
- There is a time lag in payment of wages for a month and half-a-month in the case of overheads. **(Unit-IV, Prob.5)**

10. What are credit standards ? What key variables should be considered in evaluating possible changes in credit standards ? **(Unit-V, Q.No.17)**

OR

11. Jay Manufacturing Company is going to acquire OM Distributors. The shareholders of OM Distributors will get 0.9 shares of Jay manufacturing company for each share held by them. The merger is not expected to yield in economies of scale and operating synergy. The relevant data for the two companies are as follows,

| Particulars | Jay | OM |
|---|---|---|
| Net sales (Rs. in lakhs) | 600 | 500 |
| Profit after tax (Rs. in lakhs) | 60 | 15 |
| Number of shares (lakhs) | 15 | 5 |
| Earnings per share (Rs.) | 4 | 3 |
| Market value per share (Rs) | 45 | 30 |
| Price-earning ratio | 11.25 | 10 |

For the combined company (after merged) you need to calculate (a) EPS, (b) P/E ratio, (c) Marke value per share, (d) Nuber of shares and (e) Total market capitalization. Also calculate the premium paid by Jay Co. to the shareholders of OM distributors. **(Unit-V, Prob.13)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**M.B.A II - Semester Examination**

**Model Paper - II**

**R19**

# FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**Note :** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A (5 × 5 = 25 Marks)**
**[Short Answer type]**

**ANSWERS**

1. (a) Functions of financial manager **(Unit-I, SQA-3)**

   (b) What is Internal Rate of Return? **(Unit-II, SQA-7)**

   (c) Explain the major forms of dividend. **(Unit-III, SQA-11)**

   (d) Differences between Gross Vs Net Working Capital. **(Unit-IV, SQA-3)**

   (e) Define cash management. **(Unit-V, SQA-1)**

**PART - B (5 × 10 = 50 Marks)**

**[Essay Answer type]**

2. Compare and contrast profit maximization, Wealth maximization and welfare maximization. **(Unit - I, Q.No.12)**

OR

3. Find the present value of ` 1,00,000 receivable after 8 years if the rate of discount is,

   (i) 10% and (ii) 5% **(Unit-I, Prob.7)**

4. A company has 15% perfectual Debt of Rs.100,000. The Tax rate is 35%. Determined cost of capital (Before tax and After tax) assuming Debt is issued

   1. at par

   2. at 10% discount

   3. at 10% premium **(Unit-II, Prob.18)**

OR

5. State the Importance of Cost of Capital in Capital Budgeting and capital structure planning decisions. **(Unit-II, Q.No.36)**

6. X Ltd., had 50,000 equity shares of Rs. 10 each outstanding on January 1. The share are currently being quoted at par in the market. The company now intends to pay a dividend of Rs. 2 per whose appropriate capitalization rate is 15%

Using M.M. model and assuming capitalization rate is 15%. Using M.M. Model and assuming no taxes, ascertain the price of the company's share as it is likely to prevail at the end of the year,

i) When dividend is declared and

ii) When no dividend is declared.

Also find out the number of new equity shares that the company must issue to meet its investment needs of Rs. 2 lakhs, assuming a net income of Rs. 1,10,000 and also assuming that the dividend is paid. **(Unit-III, Prob.24)**

OR

7. Techno Manpower Ltd. expecting EBIT of Rs. 5,00,000 per annum on investment of Rs.10,00,000. Company is in need of Rs.8,00,000 for its expansion activities. Company can raise this amount by either equity shares capital or 12% preference share capital or 10% debentures. The company is considering the following financing patterns. :

(a) 10,00,000 through issues of Equity Shares at par;

(b) 5,00,000 by issue of Equity Share Capital and remaining 5,00,000 by issue of debentures;

(c) 5,00,000 through Equity Shares and 2,50,000 through 12% Preference Share Capital and remaining 2,50,000 through 10% debentures.

(d) 5,00,000 through debt and 2,50,000 through Equity Shares and remaining 2,50,000 through 12% preference Share Capital.

Find out the best financing mix assuming 50% tax rate. **(Unit-III, Prob.10)**

8. Explain various methods are used in estimation of working capital. **(Unit-IV, Q.No.9)**

OR

9. XYZ Ltd. information is given below

Production of the year 69,000 units

Finished goods in store, 3 months

Raw material in store 2 months consumption

Production process 1 month

Credit allowed by creditors, 2 months

Credit given to debtors, 3 months

Selling price per unit Rs. 50

Raw material 50 percent of selling price

Direct wages, 10 percent of selling price

Manufacturing and administrative overheads, 16 percent of selling price

Selling over heads, 4 percent of selling price

There is a regular production and sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. Calculate the working capital requirement. **(Unit-IV, Prob.7)**

10. Define inventory management. Explain the components of inventory. **(Unit-V, Q.No.26)**

OR

11. From the following particulars prepare a monthly cash budget for the quarter ended 31s' March 2004.

(` in lakhs)

| Month | Sales | Purchases | Wages | Expenses |
|---|---|---|---|---|
| Nov '03 | 300 | L00 | Z00 | 040 |
| Dec -03 | 6.00 | 2.00 | 2.00 | 0.40 |
| Jan '04 | 4.00 | 3.00 | 2.20 | 0.50 |
| Feb '04 | 5.00 | 2.00 | 2.20 | 0.50 |
| March '04 | 6.00 | 1.00 | 2.40 | 0.50 |

Additional information:

- 10 per cent sales and purchases are on cash.
- Credit to debtors: one month on an average, 50% of debtor will make payment on the due date while the rest will make payment one month thereafter.
- Credit from creditors: 2 months.
- Wages to be paid twice in a month on the Is' and 16"' respectively.
- Expenses are generally paid within the month.
- Plant costing ` 1.00 lakh will be installed in February on payment of 25% of the cost in addition to the installation cost of ` 5,000, balance to be paid in three equal installments from the following month.
- Opening cash balance is 2,00,000. **(Unit-V, Prob.3)**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

**M.B.A II - Semester Examination**

**Model Paper - III** **R19**

## FINANCIAL MANAGEMENT

Time : 3 Hours] [Max. Marks : 75

**Note :** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

### PART - A (5 × 5 = 25 Marks)
### [Short Answer type]

**ANSWERS**

1. (a) Explain about sensitivity analysis. **(Unit-I, SQA-12)**

(b) Weighted Average Cost of Capital. **(Unit-II, SQA-10)**

(c) Define over capitalization ? **(Unit-III, SQA-3)**

(d) Trade Credit **(Unit-IV, SQA-8)**

(e) Economic Order Quantity (EOQ). **(Unit-V, SQA-13)**

### PART - B (5 × 10 = 50 Marks)
### [Essay Answer type]

2. Discuss in detail Present Value (or) Discounting Technique Technique. **(Unit-I, Q.No.21)**

OR

3. Explain the concept of Risk-Return Trade Off. State the various decisions involved in Risk-Return Trade Off. **(Unit-I, Q.No.17)**

4. A company is planning to purchase a machine to meet the increased demand for its products in the market. The machine costs Rs. 5,00,000 and has no salvage value. The expected life of the machine is 5 years, and the company employs straight line method of depreciation for tax purposes. The estimated earnings after taxes are Rs. 50,000 each year for 5 years. The after-tax required rate of return of the company is 12 percent. Determine the IRR. **(Unit-II, Prob.15)**

OR

5. Explain the Significance of cost of capital. **(Unit-II, Q.No.22)**

6. ABC Pharma Ltd. has ` 50 crore of debt carrying an interest of 12 percent. Its EBIT is ` 15 crore. ABC Pharma Limited's shareholders require a return of 20 percent. What is the average cost capital of ABC Pharma Ltd., under the net income approach? **(Unit-III, Prob.14)**

OR

7. The earnings per share of company is Rs. 8 and the rate of capitalization applicable is 10%. The company has before it an option of adoption.

i) 50%

ii) 75% and

iii) 100% dividend payout ratio.

Compute the market price of the company's quoted shares as per Walter's model if it can earn a return of,

i) 15%

ii) 10% and

iii) 5% on its retained earnings. **(Unit-III, Prob.6)**

8. Explain the factors determining the Working Capital requirements ? **(Unit-IV, Q.No.6)**

OR

9. A Ltd. is into the retail business. You are advised to project its Working Capital requirement from the following data:

Annual Sales: ` 120 lakhs

Net Profit on Cost of Sales: 25%

Average Period allowed to Debtors: 6 weeks

Average Period allowed by Creditors: 3 weeks

Average stock carried: 8 weeks sales

Add 10% for contingencies. **(Unit-IV, Prob.8)**

10. Explain the various techniques are used in monitoring receivables. **(Unit-V, Q.No.20)**

OR

11. The following data relate to companies BPL and CPL,

| Particulars | BPL | CPL |
|---|---|---|
| Earning after taxes (Rs.) | 7,00,000 | 1,87,500 |
| Equity shares outstanding | 1,00,000 | 37,500 |
| P/E ratio (times) | 10 | 8 |
| Market price (Rs.) | 70 | 40 |

Company BPL is the acquiring company, exchanging its one share for every 1.5 shares of CPL. Assume that company expects to have the same earnings and P/E ratio after the merger as before (no synergy effect), show the extent of gain accruing to the shareholders of the two companies as a result of the merger. Are they better or worse off than they were before the merger ? **(Unit-V, Prob.14)**