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INDEX

CHAPTER 1

SCOPE & OBJECTIVES OF FINANCIAL MANAGEMENT

QUESTION 1 : MTP – MAR 2018 / MTP – MAR 2022

EXPLAIN Financial Distress and explain its relationship with Insolvency.

OR

'Financial distress is a position where Cash inflows of a firm are inadequate to meet all its current obligations.' Based on above mentioned context, EXPLAIN Financial Distress along with Insolvency.

SOLUTION :

There are various factors like price of the product/ service, demand, price of inputs e.g. raw material, Labour etc., which is to be managed by an organization on a continuous basis. Proportion of debt also needs to be managed by an organization very delicately. Higher debt requires higher interest and if the cash inflow is not sufficient then it will put lot of pressure to the organization. Both short term and long term creditors will put stress to the firm. If all the above factors are not well managed by the firm, it can create situation known as distress, so financial distress is a position where Cash inflows of a firm are inadequate to meet all its current obligations.

Now if distress continues for a long period of time, firm may have to sell its asset, even many times at a lower price. Further when revenue is inadequate to revive the situation, firm will not be able to meet its obligations and become insolvent. So, insolvency basically means inability of a firm to repay various debts and is a result of continuous financial distress.

QUESTION 2 : PYP – MAY 2018 / PYP – NOV 2020

List out the role of Chief Financial Officer in today's World.

OR

What are the roles of Finance Executive in Modem World?

SOLUTION :

Role of Chief Financial Officer (CFO) in Today9s World: Today, the role of chief financial officer, or CFO, is no longer confined to accounting, financial reporting and risk management. It9s about

being a strategic business partner of the chief executive officer, or CEO. Some of the role of a CFO in today9s world are as follows-

- Budgeting
- Forecasting
- Managing M&As
- Profitability analysis (for example, by customer or product)
- Pricing analysis
- Decisions about outsourcing
- Overseeing the IT function.
- Overseeing the HR function.
- Strategic planning (sometimes overseeing this function).
- Regulatory compliance.
- Risk management

QUESTION 3 : RTP – MAY 2018 / RTP – NOV 2018 / RTP – MAY 2020

The profit maximization is not an operationally feasible criterion. Discuss.

SOLUTION :

"The profit maximization is not an operationally feasible criterion." This statement is true because Profit maximization can be a short-term objective for any organization and cannot be its sole objective. Profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:

(a) **Vague term:** The definition of the term profit is ambiguous. Does it mean short term or long term profit? Does it refer to profit before or after tax? Total profit or profit per share?

(b) **Timing of Return**: The profit maximization objective does not make distinction between returns received in different time periods. It gives no consideration to the time value of money, and values benefits received today and benefits received after a period as the same.

(c) It ignores the risk factor.

(d) The term maximization is also vague

QUESTION 4 : MTP – AUG 2018 / MTP – OCT 2020 / MTP – MAR 2023 / MTP – APR 2021 / MTP – APR 2023 / RTP – NOV 2020 / RTP - MAY 2022 / RTP – NOV 2023

STATE Agency Cost. DISCUSS The Ways to Reduce the Effect of It.

OR

DISCUSS Agency Problem and Agency Cost.

SOLUTION :

Agency Cost: In a sole proprietorship firm, partnership etc., owners participate in management but in corporate, owners are not active in management so, there is a separation

between owner/ shareholders and managers. In theory managers should act in the best interest of shareholders however in reality, managers may try to maximize their individual goal like salary, perks etc., so there is a principal-agent relationship between managers and owners, which is known as Agency Problem. In a nutshell, Agency Problem is the chances that managers may place personal goals ahead of the goal of owners. Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behavior so as to maximize shareholder9s wealth. Generally, Agency Costs are of four types (I) monitoring (ii)
bonding (iii) opportunity (iv) structuring

Addressing the agency problem

The agency problem arises if manager9s interests are not aligned to the interests of the debt lender and equity investors. The agency problem of debt lender would be addressed by imposing negative covenants i.e. the managers cannot borrow beyond a point. This is one of the most important concepts of modern day finance and the application of this would be applied in the Credit Risk Management of Bank, Fund Raising, Valuing distressed companies.

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the share- holders. It is easier said than done.

However, following efforts have been made to address these issues:

(A) Managerial compensation is linked to profit of the company to some extent and also with the long term objectives of the company.

(B) Employee is also designed to address the issue with the underlying assumption that maximisation of the stock price is the objective of the investors.

(C) Effecting monitoring can be done.

QUESTION 5 : MTP – MAR 2019

EXPLAIN as to how the wealth maximization objective is superior to the profit maximization objective. What is the cost of these sources?

SOLUTION :

A firm's financial management may often have the following as their objectives:

(i) The maximization of firm9s profit.

(ii) The maximization of firm9s value / wealth.

The maximization of profit is often considered as an implied objective of a firm. To achieve the aforesaid objective various type of financing decisions may be taken. Options resulting into maximization of profit may be selected by the firm9s decision makers. They even sometime may adopt policies yielding exorbitant profits in short run which may prove to be unhealthy for the growth, survival and overall interests of the firm. The profit of the firm in this case is measured in terms of its total accounting profit available to its shareholders.

The value/wealth of a firm is defined as the market price of the firm's stock. The market price of a firm's stock represents the focal judgment of all market participants as to what the value of the particular firm is. It takes into account present and prospective future earnings per share, the timing and risk of these earnings, the dividend policy of the firm and many other factors that bear upon the market price of the stock.

The value maximization objective of a firm is superior to its profit maximization objective due to following reasons.

1. The value maximization objective of a firm considers all future cash flows, dividends, earning per share, risk of a decision etc. whereas profit maximization objective does not consider the effect of EPS, dividend paid or any other returns to shareholders or the wealth of the shareholder.
2. A firm that wishes to maximize the shareholder9s wealth may pay regular dividends whereas a firm with the objective of profit maximization may refrain from dividend payment to its shareholders.
3. Shareholders would prefer an increase in the firm9s wealth against its generation of increasing flow of profits.
4. The market price of a share reflects the shareholders expected return, considering the long- term prospects of the firm, reflects the differences in timings of the returns, considers risk and recognizes the importance of distribution of returns.

The maximization of a firm9s value as reflected in the market price of a share is viewed as a proper goal of a firm. The profit maximization can be considered as a part of the wealth maximization strategy.

QUESTION 6 : RTP – MAY 2019

Functions of Finance Manager.

SOLUTION :

Functions of Finance Manager

The Finance Manager9s main objective is to manage funds in such a way so as to ensure their optimum utilization and their procurement in a manner that the risk, cost and control considerations are properly balanced in a given situation. To achieve these objectives the Finance Manager performs the following functions:

(i) **Estimating the requirement of Funds:** Both for long-term purposes i.e. investment in fixed assets and for short-term i.e. for working capital. Forecasting the requirements of funds involves the use of techniques of budgetary control and long-range planning.

(ii) **Decision regarding Capital Structure**: Once the requirement of funds has been estimated, a decision regarding various sources from which these funds would be raised has to be taken. A proper balance has to be made between the loan funds and own funds. He has to ensure that he raises sufficient long term funds to finance fixed assets and other long term investments and to provide for the needs of working capital.

(iii) **Investment Decision:** The investment of funds, in a project has to be made after careful assessment of various projects through capital budgeting. Assets management policies are to be laid down regarding various items of current assets. For e.g. receivable in coordination with sales manager, inventory in coordination with production manager.

(iv) **Dividend decision**: The finance manager is concerned with the decision as to how much to retain and what portion to pay as dividend depending on the company9s policy. Trend of earnings, trend of share market prices, requirement of funds for future growth, cash flow situation etc., are to be considered.

(v) **Evaluating financial performance:** A finance manager has to constantly review the financial performance of the various units of organisation generally in terms of ROI Such a review helps the management in seeing how the funds have been utilised in various divisions and what can be done to improve it.

(vi) **Financial negotiation**: The finance manager plays a very important role in carrying out negotiations with the financial institutions, banks and public depositors for raising of funds on favourable terms.

(vii) **Cash management**: The finance manager lays down the cash management and cash disbursement policies with a view to supply adequate funds to all units of organisation and to ensure that there is no excessive cash.

(viii) **Keeping touch with stock exchange**: Finance manager is required to analyse major trends in stock market and their impact on the price of the company share.

QUESTION 7 : MTP – OCT 2019 / MTP – OCT 2018 / MTP – OCT 2021 / RTP – NOV 2019 / RTP – MAY 2019 / PYP – NOV 2019 / PYP – MAY 2018

DISCUSS the Inter relationship between investment, financing and dividend decisions.

OR

DISCUSS the three major decisions taken by a finance manager to maximize the wealth of shareholders.

OR

BRIEFLY explain the three finance function decisions.

OR

What are the two main aspects of the Finance Function?

SOLUTION :

Inter-relationship between Investment, Financing and Dividend Decisions : The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. It is correct to say that these decisions are inter-related because the underlying objective of these three decisions is the same, i.e. maximization of shareholders' wealth. Since investment, financing and dividend decisions are all interrelated, one has to consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions. This is possible by evaluating each decision in relation to its effect on the shareholders' wealth.

The above three decisions are briefly examined below in the light of their inter-relationship and to see how they can help in maximizing the shareholders9 wealth i.e. market price of the company's shares.

Investment decision: The investment of long term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is

adequate to meet its cost of financing. This have an influence on the profitability of the company and ultimately on its wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager has to maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he has to ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximize their wealth.

Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximizes shareholders' wealth.

The above discussion makes it clear that investment, financing and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders9 wealth.

QUESTION 8 : MTP – MAR 2021 / PYP – MAY 2022

DISCUSS the advantages and disadvantages of Wealth maximization principle.

SOLUTION :

Advantages and disadvantages of Wealth maximization principle.

Advantages:

(i) Emphasizes the long term gains

(ii) Recognizes risk or uncertainty

(iii) Recognizes the timing of returns

(iv) Considers shareholders9 return.

Disadvantages:

(i) Offers no clear relationship between financial decisions and share price.

(ii) Can lead to management anxiety and frustration.

QUESTION 9 : MTP – SEPT 2022

A finance executive of an organisation plays an important role in the company's goals, policies, and financial success. WHAT his responsibilities include?

SOLUTION :

A finance executive of an organisation plays an important role in the company's goals, policies, and financial success. His responsibilities include:

(i) **Financial analysis and planning**: Determining the proper amount of funds to employ in the firm, i.e. designating the size of the firm and its rate of growth.

(ii) **Investment decisions**: The efficient allocation of funds to specific assets.

(iii) Financing and capital structure decisions: Raising funds on favourable terms as possible i.e. determining the composition of liabilities.

(iv) **Management of financial resources** (such as working capital).

(v) **Risk management**: Protecting assets.

QUESTION 10 : MTP – OCT 2021 / PYP – NOV 2018

WRITE two main objectives of Financial Management.

SOLUTION :

Two main objectives of Financial Management

Profit Maximization

It has traditionally been argued that the primary objective of a company is to earn profit; hence the objective of financial management is also profit maximization. This implies that the finance manager has to make his decisions in a manner so that the profits of the concern are maximized. Each alternative, therefore, is to be seen as to whether or not it gives maximum profit.

Wealth / Value Maximization

We will first like to define what is Wealth / Value Maximization Model. Shareholders wealth are the result of cost benefit analysis adjusted with their timing and risk i.e. time value of money.

So, Wealth = Present Value of benefits 3 Present Value of Costs. It is important that benefits measured by the finance manager are in terms of cash flow. Finance manager should emphasis on Cash flow for investment or financing decisions not on Accounting profit. The shareholder value maximization model holds that the primary goal of the firm is to maximize its market value and implies that business decisions should seek to increase the net present value of the economic profits of the firm.

QUESTION 11 : PYP – JULY 2021

List out the steps to be followed by the manager to measure and maximize the Shareholder's Wealth?

SOLUTION :

For measuring and maximizing shareholders9 wealth, manager should follow:

- Cash Flow approach not Accounting Profit
- Cost benefit analysis
- Application of time value of money.

QUESTION 12 : RTP – NOV 2021 / PYP – JAN 2021

DISCUSS the points that demonstrates the Importance of good financial management.

SOLUTION :

Points that demonstrate the "Importance of good financial management":

- **Taking care** not to over-invest in fixed assets
- **Balancing** cash-outflow with cash-inflows
- **Ensuring** that there is a sufficient level of short-term working capital
- **Setting sales** revenue targets that will deliver growth
- **Increasing gross** profit by setting the correct pricing for products or services

- **Controlling** the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and
- **Tax planning** that will minimize the taxes a business has to pay.

QUESTION 13 : PYP – DEC 2021

Explain in brief the phases of the evolution of financial management.

SOLUTION :

Evolution of Financial Management: Financial management evolved gradually over the past 50 years. The evolution of financial management is divided into three phases. Financial Management evolved as a separate field of study at the beginning of the century.

The three stages of its evolution are:

The Traditional Phase: During this phase, financial management was considered necessary only during occasional events such as takeovers, mergers, expansion, liquidation, etc. Also, when taking financial decisions in the organization, the needs of outsiders (investment bankers, people who lend money to the business and other such people) to the business was kept in mind.

The Transitional Phase: During this phase, the day-to-day problems that financial managers faced were given importance. The general problems related to funds analysis, planning and control were given more attention in this phase.

The Modern Phase: Modern phase is still going on. The scope of financial management has greatly increased now. It is important to carry out financial analysis for a company. This analysis helps in decision making. During this phase, many theories have been developed regarding efficient markets, capital budgeting, option pricing, valuation models and also in several other important fields in financial management. Here, financial management is viewed as a supportive and facilitative function, not only for top management but for all levels of management.

QUESTION 14 : MTP – APR 2023 / RTP – MAY 2021 / RTP – MAY 2022

Distinguish between Profit maximisation vis-a-vis wealth maximization.

OR

'Profit maximisation is not the sole objective of a company. It is at best a limited objective. If profit is given undue importance, a number of problems can arise.' Discuss four of such problems.

OR

EXPLAIN "Wealth maximisation" and "Profit maximisation" objectives of financial management

SOLUTION :

It has traditionally been argued that the primary objective of a company is to earn profit; hence the objective of financial management is also profit maximisation. This implies that the finance manager has to make his decisions in a manner so that the profits of the concern are maximised. Each alternative, therefore, is to be seen as to whether or not it gives maximum profit.

However, profit maximisation cannot be the sole objective of a company. It is at best a limited objective. If profit is given undue importance, a number of problems can arise. Some of these have been discussed

below:

(i) The term profit is vague. It does not clarify what exactly it means. It conveys a different meaning to different people. For example, profit may be in short term or long term period; it may be total profit or rate of profit etc.

(ii) Profit maximisation has to be attempted with a realisation of risks involved. There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.

(iii) Profit maximisation as an objective does not take into account the time pattern of returns. Proposal A may give a higher amount of profits as compared to proposal B, yet if the returns of proposal A begin to flow say 10 years later, proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick.

(iv) Profit maximisation as an objective is too narrow. It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

Wealth / Value Maximisation

We will first like to define what is Wealth / Value Maximization Model. Shareholders wealth are the result of cost benefit analysis adjusted with their timing and risk i.e. time value of money.

So, It is important that benefits measured by the finance manager are in terms of cash flow. Finance manager should emphasis on Cash flow for investment or financing decisions not on Accounting profit. The shareholder value maximization model holds that the primary goal of the firm is to maximize its market value and implies that business decisions should seek to increase the net present value of the economic profits of the firm. So for measuring and maximising shareholders wealth finance manager should follow:

A) Cash Flow approach not Accounting Profit

B) Cost benefit analysis

C) Application of time value of money.

How do we measure the value/wealth of a firm?

According to Van Horne, "Value of a firm is represented by the market price of the company's common stock. The market price of a firm's stock represents the focal judgment of all market participants as to what the value of the particular firm is. It takes into account present and prospective future earnings per share, the timing and risk of these earnings, the dividend policy of the firm and many other factors that bear upon the market price of the stock. The mark et price serves as a performance index or report card of the firm's progress. It indicates how well management is doing on behalf of stockholder's".

Why Wealth Maximization Works?

Before we answer this question it is important to first understand and know what other goals a business enterprise may have. Some of the other goals a business enterprise may follow are:-

A) Achieving a higher growth rate
B) Attaining a larger market share
C) Gaining leadership in the market in terms of products and technology
D) Promoting employee welfare
E) Increasing customer satisfaction
F) Improving community life, supporting education and research, solving societal problems, etc.

Though, the above goals are important but the primary goal remains to be wealth maximization, as it is critical for the very existence of the business enterprise. If this goal is not met, public / institutions would lose confidence in the enterprise and will not invest further in the growth of the organization. If the growth of the organization is restricted than the other goals like community welfare will not get fulfilled.

Conflicts in Profit vs. Value maximisation principle

In any company, the management is the decision taking authority. As a normal tendency the management may pursue its own personal goals (profit maximization). But in an organization where there is a significant outside participation (shareholding, lenders etc.), the management may not be able to exclusively pursue its personal goals due to the constant supervision of the various stakeholders of the company-employees, creditors, customers, government, etc.

Every entity associated with the company will evaluate the performance of the management from the fulfilment of its own objective. The survival of the management will be threatened if the objective of any of the entities remains unfulfilled.

The wealth maximization objective is generally in accord with the interests of the various groups such as owners, employees, creditors and society, and thus, it may be consistent with the management objective of survival.

Owing to limitation (timing, social consideration etc.) in profit maximization, in today9s real world situations which is uncertain and multi-period in nature, wealth maximization is a better objective. Where the time period is short and degree of uncertainty is not great, wealth maximization and profit maximization amount to essentially the same.

The table below highlights some of the advantages and disadvantages of both profit maximization and wealth maximization goals:-

Goal	Objective	Advantages	Disadvantages
Profit Maximization	Large amount of profits	(i) Easy to calculate profits	(i) Emphasizes the short term gains
		(ii) Easy to determine the link between financial decisions and profits.	(ii) Ignores risk or uncertainty
			(iii) Ignores the timing of returns
			(iv) Requires immediate resources.
Shareholders Wealth Maximisation	Highest market value of shares.	(i) Emphasizes the long term gains	(i) Offers no clear relationship between financial decisions and share price.
		(ii) Recognises risk or uncertainty	(ii) Can lead to management anxiety and frustration.

		(iii) Recognises the timing of returns	
		(iv) Considers shareholders' return.	

Example: Profit maximization can be achieved in the short term at the expense of the long term goal, that is, wealth maximization. For example, a costly investment may experience losses in the short term but yield substantial profits in the long term. Also, a firm that wants to show a short term profit may, for example, postpone major repairs or replacement, although such postponement is likely to hurt its long term profitability.

Thanks ….

CHAPTER

2

TYPES OF FINANCING

QUESTION 1 : RTP – MAY 2018 / MTP – APR 2019 / MTP – NOV 2021

DESCRIBE Bridge Finance.

OR

Briefly DESCRIBE bridge finance.

SOLUTION :

Bridge finance refers, normally, to loans taken by the business, usually from commercial banks for a short period, pending disbursement of term loans by financial institutions, normally it takes time for the financial institution to finalize procedures of creation of security, tie-up participation with other institutions etc. even though a positive appraisal of the project has been made. However, once the loans are approved in principle, firms in order not to lose further time in starting their projects arrange for bridge finance. Such temporary loan is normally repaid out of the proceeds of the principal term loans. It is secured by hypothecation of moveable assets, personal guarantees and demand promissory notes. Generally, rate of interest on bridge finance is higher as compared with that on term loans.

QUESTION 2 : RTP – MAY 2018

EXPLAIN the followings:

(a) Floating Rate Bonds

(b) Packing Credit.

SOLUTION :

(a) **Floating Rate Bonds**: These are the bonds where the interest rate is not fixed and is allowed to float depending upon the market conditions. These are ideal instruments which can be resorted to by the issuers to hedge themselves against the volatility in the interest rates. They have become more popular as a money market instrument and have been successfully issued by financial institutions like IDBI, ICICI etc.

(b) **Packing Credit**: Packing credit is an advance made available by banks to an exporter. Any exporter, having at hand a firm export order placed with him by his foreign buyer on an

irrevocable letter of credit opened in his favour, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus Packing Credit is essentially a short-term advance.

QUESTION 3 : PYP – MAY 2018 / MTP – MAR 2021

DEFINE Masala bond.

SOLUTION :

Masala bond: Masala (means spice) bond is an Indian name used for Rupee denominated bond that Indian corporate borrowers can sell to investors in overseas markets. These bonds are issued outside India but denominated in Indian Rupees. NTPC raised Rest. 2,000 crores via masala bonds for its capital expenditure in the year 2016.

QUESTION 4 : PYP – MAY 2018 / PYP – NOV 2019

Briefly describe any four sources of short-term finance.

OR

What are the sources of short term financial requirement of the company?

SOLUTION :

Sources of Short Term Finance: There are various sources available to meet short- term needs of finance. The different sources are discussed below-

(i) **Trade Credit**: It represents credit granted by suppliers of goods, etc., as an incident of sale. The usual duration of such credit is 15 to 90 days. It generates automatically in the course of business and is common to almost all business operations. It can be in the form of an 'open account' or 'bills payable'.

(ii) **Accrued Expenses and Deferred Income**: Accrued expenses represent liabilities which a company has to pay for the services which it has already received like wages, taxes, interest and dividends. Such expenses arise out of the day-to-day activities of the company and hence represent a spontaneous source of finance.

Deferred Income: These are the amounts received by a company in lieu of goods and services to be provided in the future. Since these receipts increases a company9s liquidity, they are also considered to be an important sources of short- term finance.

(iii) **Advances from Customers**: Manufacturers and contractors engaged in producing or constructing costly goods involving considerable length of manufacturing or construction time usually demand advance money from their customers at the time of accepting their orders for executing their contracts or supplying the goods. This is a cost free source of finance and really useful.

(iv) **Commercial Paper**: A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note. The Reserve Bank of India introduced the commercial paper scheme in the year 1989 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors.

(v) **Treasury Bills:** Treasury bills are a class of Central Government Securities. Treasury bills, commonly referred to as T-Bills are issued by Government of India to meet short term borrowing requirements with maturities ranging between 14 to 364 days.

(vi) **Certificates of Deposit (CD):** A certificate of deposit (CD) is basically a savings certificate with a fixed maturity date of not less than 15 days up to a maximum of one year.

(vii) **Bank Advances**: Banks receive deposits from public for different periods at varying rates of interest. These funds are invested and lent in such a manner that when required, they may be called back. Lending results in gross revenues out of which costs, such as interest on deposits, administrative costs, etc., are met and a reasonable profit is made. A bank's lending policy is not merely profit motivated but has to also keep in mind the socio- economic development of the country. Some of the facilities provided by banks are Short Term Loans, Overdraft, Cash Credits, Advances against goods, Bills Purchased / Discounted.

(viii) **Financing of Export Trade by Banks**: Exports play an important role in accelerating the economic growth of developing countries like India. Of the several factors influencing export growth, credit is a very important factor which enables exporters in efficiently executing their export orders. The commercial banks provide short-term export finance mainly by way of pre and post-shipment credit. Export finance is granted in Rupees as well as in foreign currency.

(ix) **Inter Corporate Deposits**: The companies can borrow funds for a short period say 6 months from other companies which have surplus liquidity. The rate of interest on inter corporate deposits varies depending upon the amount involved and time period.

(x) **Certificate of Deposit (CD):** The certificate of deposit is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds.

The main advantage of CD is that banker is not required to encase the deposit before maturity period and the investor is assured of liquidity because he can sell the CD in secondary market.

(xi) **Public Deposits:** Public deposits are very important source of short-term and medium term finances particularly due to credit squeeze by the Reserve Bank of India. A company can accept public deposits subject to the stipulations of Reserve Bank of India from time to time maximum up to 35 per cent of its paid up capital and reserves, from the public and shareholders. These deposits may be accepted for a period of six months to three years. Public deposits are unsecured loans; they should not be used for acquiring fixed assets since they are to be repaid within a period of 3 years. These are mainly used to finance working capital requirements.

QUESTION 5 : MTP – AUG 2018

EXPLAIN the importance of trade credit and accruals as source of short-term finance. DISCUSS the cost of these sources?

SOLUTION :

Trade credit and accruals as source of short-term finance like working capital refers to credit facility given by suppliers of goods during the normal course of trade. It is a short term source of

finance. Micro small and medium enterprises (MSMEs) in particular are heavily dependent on this source for financing their working capital needs. The major advantages of trade credit are easy availability, flexibility and informality.

There can be an argument that trade credit is a cost free source of finance. But it is not. It involves implicit cost. The supplier extending trade credit incurs cost in the form of opportunity cost of funds invested in trade receivables. Generally, the supplier passes on these costs to the buyer by increasing the price of the goods or alternatively by not extending cash discount facility.

QUESTION 6 : RTP – NOV 2018 / RTP – NOV 2020 / RTP – NOV 2022

EXPLAIN the difference between Financial Lease and Operating Lease.

OR

Under financial lease, lessee bears the risk of obsolescence; while under operating lease, lessor bears the risk of obsolescence. In view of this, you are required to COMPARE the financial lease and operating lease.

SOLUTION :

Difference between Financial Lease and Operating Lease

	Financial Lease	Operating Lease
1	The risk and reward incident to ownership are passed on to the lessee. The lessor only remains the legal owner of the asset.	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor.
2	The lessee bears the risk of obsolescence.	The lessor bears the risk of obsolescence.
3	The lessor is interested in his rentals and not in the asset. He must get his principal back along with interest. Therefore, the lease is non- cancellable by either party.	As the lessor does not have difficulty in leasing the same asset to other willing lessor, the lease is kept cancelable by the lessor.
4	The lessor enters into the transaction only as financier. He does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears cost of repairs, maintenance or operations.
5	The lease is usually full payout, that is, the single lease repays the cost of the asset together with the interest.	The lease is usually non-payout, since the lessor expects to lease the same asset over and over again to several users.

QUESTION 7 : PYP – NOV 2018

Explain in brief following Financial Instruments:

(i) Euro Bonds

(ii) Floating Rate Notes

(iii) Euro Commercial paper

(iv) Fully Hedged Bond

SOLUTION :

i. **Euro bonds**: Euro bonds are debt instruments which are not denominated in the currency of the country in which they are issued. E.g. a Yen note floated in Germany.
ii. **Floating Rate Notes**: Floating Rate Notes: are issued up to seven years9 maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than foreign loans.
iii. **Euro Commercial Paper(ECP):** ECPs are short term money market instruments. They are for maturities less than one year. They are usually designated in US Dollars.
iv. **Fully Hedged Bond**: In foreign bonds, the risk of currency fluctuations exists. Fully hedged bonds eliminate the risk by selling in forward markets the entire stream of principal and interest payments.

QUESTION 8 : PYP – NOV 2018

Discuss the Advantages of Leasing.

SOLUTION :

i. **Lease may low cost alternative**: Leasing is alternative to purchasing. As the lessee is to make a series of payments for using an asset, a lease arrangement is similar to a debt contract. The benefit of lease is based on a comparison between leasing and buying an asset. Many lessees find lease more attractive because of low cost.
ii. **Tax benefit**: In certain cases, tax benefit of depreciation available for owning an asset may be less than that available for lease payment
iii. **Working capital conservation**: When a firm buy an equipment by borrowing from a bank (or financial institution), they never provide 100% financing. But in case of lease one gets normally 100% financing. This enables conservation of working capital.
iv. **Preservation of Debt Capacity:** So, operating lease does not matter in computing debt equity ratio. This enables the lessee to go for debt financing more easily. The access to and ability of a firm to get debt financing is called debt capacity (also, reserve debt capacity).
v. **Obsolescence and Disposal**: After purchase of leased asset there may be technological obsolescence of the asset. That means a technologically upgraded asset with better capacity may come into existence after purchase. To retain competitive advantage, the lessee as user may have to go for the upgraded asset.

QUESTION 9 : MTP – APR 2019 / PYP – MAY 2019

EXPLAIN the limitations of Leasing?

SOLUTION :

Limitations are:

The lease rentals become payable soon after the acquisition of assets and no moratorium period is permissible as in case of term loans from financial institutions. The lease arrangement may, therefore, not be suitable for setting up of the new projects as it would entail cash outflows even before the project comes into operation.

1) The leased assets are purchased by the lessor who is the owner of equipment. The seller9s warranties for satisfactory operation of the leased assets may sometimes not be available to lessee.

2) Lessor generally obtains credit facilities from banks etc. to purchase the leased equipment which are subject to hypothecation charge in favor of the bank. Default in payment by the lessor may sometimes result in seizure of assets by banks causing loss to the lessee.

3) Lease financing has a very high cost of interest as compared to interest charged on term loans by financial institutions/banks.

Despite all these disadvantages, the flexibility and simplicity offered by lease finance is bound to make it popular. Lease operations will find increasing use in the near future.

QUESTION 10 : RTP - MAY 2019 / PYP – MAY 2019 / MTP – OCT 2019 / RTP – MAY 2020 / MTP – MAR 2023 / RTP – MAY 2023

What is debt securitization? EXPLAIN the basics of debt securitization process.

SOLUTION :

Debt Securitization: It is a method of recycling of funds. It is especially beneficial to financial intermediaries to support the lending volumes. Assets generating steady cash flows are packaged together and against this asset pool, market securities can be issued, e.g. housing finance, auto loans, and credit card receivables.

Process of Debt Securitization

(i) **The origination function** 3 A borrower seeks a loan from a finance company, bank, HDFC. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.

(ii) **The pooling function** 3 Similar loans on receivables are clubbed together to create an underlying pool of assets. The pool is transferred in favor of Special Purpose Vehicle (SPV), which acts as a trustee for investors.

(iii) **The securitization function** 3 SPV will structure and issue securities on the basis of asset pool. The securities carry a coupon and expected maturity which can be asset-based/mortgage based. These are generally sold to investors through merchant bankers. Investors are 3 pension funds, mutual funds, insurance funds.

The process of securitization is generally without recourse i.e. investors bear the credit risk and issuer is under an obligation to pay to investors only if the cash flows are received by him from the collateral. The benefits to the originator are that assets are shifted off the balance sheet, thus giving the originator recourse to off-balance sheet funding.

QUESTION 11 : MTP - MAY 2020 / MTP – SEPT 2023

EXPLAIN in short the term Letter of Credit.

SOLUTION :

Letter of Credit: It is an arrangement by which the issuing bank on the instructions of a customer or on its own behalf undertakes to pay or accept or negotiate or authorizes another bank to do so against stipulated documents subject to compliance with specified terms and conditions.

QUESTION 12 : MTP – OCT 2020 / MTP – APR 2021 / MTP – OCT 2022 / MTP – OCT 2023

EXPLAIN in brief the features of Commercial Papers.

SOLUTION :

Commercial Paper: A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note. The Reserve Bank of India introduced the commercial paper scheme in the year 1989 with a view to enabling highly rated corporate borrowers to diversify their sources of short- term borrowings and to provide an additional instrument to investors. Subsequently, in addition to the Corporate, Primary Dealers and All India Financial Institutions have also been allowed to issue Commercial Papers. Commercial papers are issued in denominations of Rs. 5 lakhs or multiples thereof and the interest rate is generally linked to the yield on the one-year government bond.

All eligible issuers are required to get the credit rating from Credit Rating Information Services of India Ltd, (CRISIL), or the Investment Information and Credit Rating Agency of India Ltd (ICRA) or the Credit Analysis and Research Ltd (CARE) or the FITCH Ratings India Pvt. Ltd or any such other credit rating agency as is specified by the Reserve Bank of India.

QUESTION 13 : MTP – MAR 2021

DISCUSS in brief the characteristics of Debentures.

SOLUTION :

Characteristics of Debentures are as follows:

- Normally, debentures are issued on the basis of a debenture trust deed which lists the terms and conditions on which the debentures are floated.
- Debentures are either secured or unsecured.
- May or may not be listed on the stock exchange.
- The cost of capital raised through debentures is quite low since the interest payable on debentures can be charged as an expense before tax.
- From the investors' point of view, debentures offer a more attractive prospect than the preference shares since interest on debentures is payable whether or not the company makes profits.
- Debentures are thus instruments for raising long-term debt capital.
- The period of maturity normally varies from 3 to 10 years and may also increase for projects having high gestation period.

QUESTION 14 : MTP – MAR 2021 / MTP – MAR 2023

DEFINE Secured Premium Notes.

SOLUTION :

Secured Premium Notes: Secured Premium Notes is issued along with a detachable warrant and is redeemable after a notified period of say 4 to 7 years. The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

QUESTION 15 : MTP – APR 2021

DEFINE Debt Securitization.

SOLUTION :

Debt Securitization is a process in which illiquid assets are pooled into marketable securities that can be sold to investors. The process leads to the creation of financial instruments that represent ownership interest in, or are secured by a segregated income producing asset or pool of assets. These assets are generally secured by personal or real property such as automobiles, real estate, or equipment loans but in some cases are unsecured.

QUESTION 16 : RTP – MAY 2021

DISCUSS the advantages and disadvantages of raising funds by issue of preference shares.

SOLUTION :

Advantages and disadvantages of raising funds by issue of preference shares Advantages

(i) No dilution in EPS on enlarged capital base 3 On the other hand if equity shares are issued it reduces EPS, thus affecting the market perception about the company.

(ii) There is also the advantage of leverage as it bears a fixed charge (because companies are required to pay a fixed rate of dividend in case of issue of preference shares). Non-payment of preference dividends does not force a company into liquidity.

(iii) There is no risk of takeover as the preference shareholders do not have voting rights except where dividend payment are in arrears.

(iv) The preference dividends are fixed and pre-decided. Hence preference shareholders cannot participate in surplus profits as the ordinary shareholders can except in case of participating preference shareholders.

(v) Preference capital can be redeemed after a specified period.

Disadvantages

(i) One of the major disadvantages of preference shares is that preference dividend is not tax deductible and so does not provide a tax shield to the company. Hence, preference shares are costlier to the company than debt e.g. debenture.

(ii) Preference dividends are cumulative in nature. This means that if in a particular year preference dividends are not paid they shall be accumulated and paid later. Also, if these dividends are not paid, no dividend can be paid to ordinary shareholders. The non-payment of dividend to ordinary shareholders could seriously impair the reputation of the concerned company.

QUESTION 17 : MTP – OCT 2021

BRIEFLY describe the financial needs of a business.

SOLUTION :

Financial Needs of a Business: Business enterprises need funds to meet their different types of requirements. All the financial needs of a business may be grouped into the following three categories-Long-term financial needs: Such needs generally refer to those requirements of funds which are for a period exceeding 5-10 years. All investments in plant, machinery, land, buildings, etc., are considered as long-term financial needs.

Medium- term financial needs: Such requirements refer to those funds which are required for a period exceeding one year but not exceeding 5 years.

Short- term financial needs: Such type of financial needs arises to finance current assets such as stock, debtors, cash, etc. Investment in these assets is known as meeting of working capital requirements of the concern for a period not exceeding one year.

QUESTION 18 : MTP – NOV 2021

BRIEF out any four types of Preference shares along with its feature.

SOLUTION :

Sl. No.	Type of Preference Shares	Salient Features
1	Cumulative	Arrear Dividend will accumulate.
2	Non-cumulative	No right to arrear dividend.
3	Redeemable	Redemption should be done.
4	Participating	Can participate in the surplus which remains after payment to equity shareholders.
5	Non- Participating	Cannot participate in the surplus after payment of fixed rate of Dividend.
6	Convertible	Option of converting into equity Shares.

QUESTION 19 : MTP – NOV 2021 / MTP – MAR 2022 / MTP – OCT 2023

EXPLAIN any four types of Packing Credit.

SOLUTION :

(i) **Clean packing credit**: This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods. It is a clean type of export advance. Each proposal is weighed according to particular requirements of the trade and credit worthiness of the exporter. A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation (ECGC) cover should be obtained by the bank.

(ii) **Packing credit against hypothecation of goods:** Export finance is made available on certain terms and conditions where the exporter has pledge able interest and the goods are hypothecated to the bank as security with stipulated margin. At the time of utilizing the advance, the exporter is required to submit, along with the firm export order or letter of

credit relative stock statements and thereafter continue submitting them every fortnight and/or whenever there is any movement in stocks.

(iii) **Packing credit against pledge of goods**: Export finance is made available on certain terms and conditions where the exportable finished goods are pledged to the banks with approved clearing agents who will ship the same from time to time as required by the exporter. The possession of the goods so pledged lies with the bank and is kept under its lock and key.

(iv) **E.C.G.C. guarantee:** Any loan given to an exporter for the manufacture, processing, purchasing, or packing of goods meant for export against a firm order qualifies for the packing credit guarantee issued by Export Credit Guarantee Corporation.

(v) **Forward exchange contract**: Another requirement of packing credit facility is that if the export bill is to be drawn in a foreign currency, the exporter should enter into a forward exchange contact with the bank, thereby avoiding risk involved in a possible change in the rate of exchange.

QUESTION 20 : MTP – NOV 2021 / MTP – MAR 2022 / PYP – JAN 2021

EXPLAIN: Callable bonds and Puttable bonds.

SOLUTION :

(i) **Callable bonds:** A callable bond has a call option which gives the issuer the right to redeem the bond before maturity at a predetermined price known as the call price (Generally at a premium).

(ii) **Puttable bonds:** Puttable bonds give the investor a put option (i.e. the right to sell the bond) back to the company before maturity.

QUESTION 21 : PYP – DEC 2021

Write short notes on Bridge Finance and Clean Packing Credit.

SOLUTION :

Bridge Finance: Bridge finance refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions. Though it is of short-term nature but since it is an important step in the facilitation of long-term loan, therefore it is being discussed along with the long term sources of funds. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short term loans from commercial banks. The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

Clean packing credit: This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods. It is a clean type of export advance. Each proposal is weighed according to

particular requirements of the trade and credit worthiness of the exporter. A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation (ECGC) cover should be obtained by the bank.

QUESTION 22 : MTP – MAR 2022 / RTP – NOV 2022

STATE in brief four features of Samurai Bond.

SOLUTION :

Features of Samurai Bond:

- Samurai bonds are denominated in Japanese Yen JPY
- Issued in Tokyo
- Issuer Non- Japanese Company
- Regulations: Japanese
- Purpose: Access of capital available in Japanese market
- Issue proceeds can be used to fund Japanese operation
- Issue proceeds can be used to fund a company9s local opportunities.
- It can also be used to hedge foreign exchange risk

QUESTION 23 : MTP – APR 2022

DISCUSS in briefly any two long term sources of finance for a partnership firm.

SOLUTION :

The two sources of long-term finance for a partnership firm are as follows:

Loans from Commercial Banks: Commercial banks provide long term loans for the purpose of expansion or setting up of new units. Their repayment is usually scheduled over a long period of time. The liquidity of such loans is said to depend on the anticipated income of the borrowers.

As part of the long term funding for a partnership firm, the banks also fund the long term working capital requirement (it is also called WCTL i.e. working capital term loan).

Lease financing: Leasing is a general contract between the owner and user of the asset over a specified period of time. The asset is purchased initially by the lessor (leasing company) and thereafter leased to the user (lessee firm) which pays a specified rent at periodical intervals. Thus, leasing is an alternative to the purchase of an asset out of own or borrowed funds. Moreover, lease finance can be arranged much faster as compared to term loans from financial institutions.

QUESTION 24 : MTP – SEPT 2022

WHAT is the meaning of Venture Capital Financing. STATE some characteristics of it.

SOLUTION :

Venture Capital Financing: The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas. In broad sense, under venture capital financing, venture capitalist make investment to purchase equity or debt securities from inexperienced entrepreneurs who undertake highly risky ventures with potential to succeed in future.

Some of the characteristics of Venture Capital financing are:

- It is basically an equity finance in new companies.
- It can be viewed as a long-term investment in growth-oriented small/medium firms.
- Apart from providing funds, the investor also provides support in form of sales strategy, business networking and management expertise, enabling the growth of the entrepreneur.

QUESTION 25 : MTP – SEPT 2022

BRIEF OUT certain sources of finance- Inter Corporate Deposits and Certificate of Deposit.

SOLUTION :

Inter Corporate Deposits: The companies can borrow funds for a short period, say 6 months, from other companies which have surplus liquidity. The rate of interest on inter corporate deposits varies depending upon the amount involved and the time period.

Certificate of Deposit (CD): The certificate of deposit is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds. The main advantage of CD is that banker is not required to encash the deposit before maturity period and the investor is assured of liquidity because he can sell the CD in secondary market

QUESTION 26 : MTP – SEPT 2022

STATE in brief four features of Plain Vanilla Bond.

SOLUTION :

Features of Plain Vanilla Bond:

- The issuer would pay the principal amount along with the interest rate.
- This type of bond would not have any options.
- This bond can be issued in the form of discounted bond or can be issued in the form of coupon bearing bond.

QUESTION 27 : MTP – OCT 2022

Write a short note on seed capital assistance.

SOLUTION :

Seed Capital Assistance: The seed capital assistance has been designed by IDBI for professionally or technically qualified entrepreneurs. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme. The project cost should not exceed Rs. 2 crores and the maximum assistance under the project will be restricted to 50% of the required promoter9s contribution or Rs. 15 lacs whichever is lower.

The seed capital assistance is interest free but carries a security charge of one percent per annum for the first five years and an increasing rate thereafter

QUESTION 28 : RTP – NOV 2021 / PYP – NOV 2020

EXPLAIN some common methods of Venture capital financing.

SOLUTION :

Some common methods of venture capital financing are as follows:

(i) **Equity financing**: The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.

(ii) **Conditional loan**: A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest (which could be well above 20 per cent) instead of royalty on sales once it becomes commercially sound.

(iii) **Income note**: It is a hybrid security which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI9s VCF provides funding equal to 80 3 87.50% of the projects cost for commercial application of indigenous technology.

(iv) **Participating debenture**: Such security carries charges in three phases 4 in the start-up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.

QUESTION 29 : PYP – JULY 2021

Explain in brief the forms of Post Shipment Finance.

SOLUTION :

Post-shipment Finance: It takes the following forms:

a. **Purchase/discounting of documentary export bills:** Finance is provided to exporters by purchasing export bills drawn payable at sight or by discounting since export bills covering confirmed sales and backed by documents including documents of the title of goods such as bill of lading, post parcel receipts, or air consignment notes.

b. **E.C.G.C. Guarantee**: Post-shipment finance, given to an exporter by a bank through purchase, negotiation or discount of an export bill against an order, qualifies for post-shipment export credit guarantee. It is necessary, however, that exporters should obtain a shipment or contracts risk policy of E.C.G.C. Banks insist on the exporters to take a contracts shipment (comprehensive risks) policy covering both political and commercial risks. The Corporation, on acceptance of the pol icy, will fix credit limits for individual exporters and the Corporation9s liability will be limited to the extent of the limit so fixed for the exporter concerned irrespective of the amount of the policy.

c. **Advance against export bills sent for collection**: Finance is provided by banks to exporters by way of advance against export bills forwarded through them for collection, taking

into account the creditworthiness of the party, nature of goods exported, since, standing of drawee, etc.

d. **Advance against duty draw backs, cash subsidy, etc**.: To finance export losses sustained by exporters, bank advance against duty draw-back, cash subsidy, etc., receivable by them against export performance. Such advances are of clean nature; hence necessary precaution should be exercised.

QUESTION 30 : PYP – MAY 2022

Distinguish between American Depository Receipts and Global Depository Receipts.

SOLUTION :

Distinguish Between American Depository Receipts and Global Depository Receipts:

	American Depository Receipts	**Global Depository Receipts**
Meaning	It is a negotiable instrument which is issued by US bank, which represent the nazon-US Company stock that is being traded in US stock Exchange	It is a negotiable instrument which is issued by the international depository bank that represent the foreign company's stock trading world-wide.
Issued where	In the US domestic capital market.	European capital market.
Listed in	In the American Stock Exchange	In the Non-US Stock Exchange
Relevance	Foreign companies are able to trade in the US Stock Market.	Foreign companies can trade in any country's stock market other than that of the US.

Alternatively:

American Depository Receipts (ADRs): These are securities offered by non-US companies who want to list on any of the US exchange. Each ADR represents a certain number of a company's regular shares. ADRs allow US investors to buy shares of these companies without the costs of investing directly in a foreign stock exchange.

Global Depository Receipts (GDRs): These are negotiable certificates held in the bank of one country representing a specific number of shares of a stock traded on the exchange of another country. These financial instruments are used by companies to raise capital in either dollars or Euros. These are mainly traded in European countries and particularly in London.

QUESTION 31 : PYP – NOV 2022

These bonds are issued by non-US Banks and non-US corporations in US. What this bond is called and what are the other features of this Bond?

SOLUTION :

The Bond is called as Yankee Bond. Features of the bond:

- These bonds are denominated in Dollars
- Bonds are to be registered in SEC (Securities and Exchange Commission)
- Bonds are issued in tranches
- Time taken can be up to 14 weeks

QUESTION 32 : RTP – MAY 2023

HIGHLIGHT the similarities and differences between Samurai Bond and Bull Dog Bond.

SOLUTION :

Samurai Bond	Samurai bonds are denominated in Japanese Yen JPY
	Issued in Tokyo
	Issuer Non- Japanese Company
	Regulations: Japanese
	Purpose: Access of capital available in Japanese market
	Issue proceeds can be used to fund Japanese operation
	Issue proceeds can be used to fund a company9s local
	opportunities.
	It can also be used to hedge foreign exchange risk
Bulldog Bond	It is denominated in Bulldog Pound Sterling/Great Britain Pound (GBP)
	Issued in London
	Issuer Non- UK Company
	Regulations: Great Britain
	Purpose: Access of capital available in UK market
	Issue proceeds can be used to fund UK operation
	Issue proceeds can be used to fund a company's local opportunities

QUESTION 33 : PYP – MAY 2023

List out the conditions, framed by SEBI, which a company needs to fulfil in order to issue of bonus shares.

SOLUTION :

To issue Bonus shares, a Company needs to fulfill all the conditions given by Securities Exchange Board of
India (SEBI):

(i) As per SEBI, the bonus shares are issued not in lieu of cash dividends.

(ii) A bonus issue should be authorized by Article of Association (AOA) and not to be declared unless all partly paid-up shares have been converted into fully paid-up shares.

(iii) The Company should not have defaulted on re-payment of loan, interest, and any statutory dues.

(iv) Bonus shares are to be issued only from share premium and free reserves and not from capital reserve on account of fixed assets revaluation.

QUESTION 34 : PYP – MAY 2023

Discuss features of Secured Premium Notes.

Features of Secured Premium Notes:

- SPN instruments are issued with a detachable warrant.
- These instruments are redeemable after a notified period of say 4 to 7 years.
- No interest is paid during the lock in period.
- The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

QUESTION 35 : RTP – NOV 2023

DESCRIBE the inter relationship between investing, financing, and dividend decisions.

SOLUTION :

Inter-relationship between Investment, Financing and Dividend Decisions

The finance functions are divided into three major decisions, viz., investment, financing, and dividend decisions. It is correct to say that these decisions are inter - related because the underlying objective of these three decisions is the same, i.e., maximisation of shareholders9 wealth. Since investment, financing and dividend decisions are all interrelated, one must consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions.

This is possible by evaluating each decision in relation to its effect on the shareholders9 wealth.

The above three decisions are briefly examined below in the light of their inter - relationship and to see how they can help in maximising the shareholders9 wealth i.e., market price of the company's shares.

Investment decision: The investment of long-term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is adequate to meet its cost of financing. This has an influence on the profitability of the company and ultimately on its wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager must maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he must ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximise their wealth.

Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximises shareholders' wealth.

The above discussion makes it clear that investment, financing, and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders9 wealth.

QUESTION 36 : RTP – NOV 2023

STATE the meaning of debt securitization

SOLUTION :

Debt Securitisation: It is a method of recycling of funds. It is especially beneficial to financial intermediaries to support the lending volumes. Assets generating steady cash flows are packaged together and against this asset pool, market securities can be issued, e.g., housing finance, auto loans, and credit card receivables.

Process of Debt Securitisation

(i) The origination function 3 A borrower seeks a loan from a finance company, bank. The credit worthiness of borrower is evaluated, and contract is entered into with repayment schedule structured over the life of the loan.

(ii) The pooling function 3 Similar loans on receivables are clubbed together to create an underlying pool of assets. The pool is transferred in favour of Special purpose Vehicle (SPV), which acts as a trustee for investors.

(iii) The securitisation function 3 SPV will structure, and issue securities based on asset pool. The securities carry a coupon and expected maturity which can be asset-based/mortgage based. These are generally sold to investors through merchant bankers. Investors are 3 pension funds, mutual funds, insurance funds.

Thanks ….

CHAPTER

3

FINANCIAL ANALYSIS & PLANNING – RATIOS ANALYSIS

QUESTION 1 : MAY 2018

The accountant of Moon Ltd. has reported the following data

Gross profit	Rs 60,000
Gross profit Margin	20%
Total Asset Turnover	0.3 : 1
Net worth To Total Assets	0.9 : 1
Current Ratio	1.5 : 1
Liquid Ratio	1 : 1
Credit sales To Total Sales	0.8 : 1
Average Collection Period	60 days

Assume 360 days a year

You are required to complete the following

Balance sheet of Moon Ltd.

Liabilities	Rs	Assets	Rs
Net Worth Current Liabilities		Fixed Asset Stock Debtors Cash	
Total Liabilities		Total Assets	

SOLUTION :

Preparation of Balance Sheet Working Notes:

Sales = Gross Profit / Gross Profit Margin
= 60,000 / 0.2 = Rs.3,00,000

Total Assets = Sales / Total Asset Turnover
= 3,00,000 / 0.3 = Rs.10,00,000

Net Worth = 0.9 X Total Assets
= 0.9 X Rs.10,00,000 = Rs.9,00,000

Current Liability = Total Assets - Net Worth

= Rs.10,00,000 - Rs.9,00,000
= Rs.1,00,000

Current Assets = 1.5 x Current Liability
= 1.5 x Rs.1,00,000 = Rs.1,50,000

Stock = Current Assets – Liquid Assets
= Current Assets - (Liquid Assets / Current Liabilities =1)
= 1,50,000 3 (LA / 1,00,000 = 1) = Rs. 50,000

Debtors = Average Collection Period X Credit Sales / 360
= 60 x 0.8 x 3,00,000 / 360 = Rs. 40,000

Cash = Current Assets - Debtors - Stock
= Rs.1,50,000 - Rs. 40,000 - Rs. 50,000
= Rs. 60,000

Fixed Assets = Total Assets - Current Assets
= Rs.10,00,000 - Rs.1,50,000
= Rs. 8,50,000

Balance Sheet

Liabilities	Rs	Assets	Rs
Net Worth	9,00,000	Fixed Asset	8,50,000
Current Liabilities	1,00,000	Stock	50,000
		Debtors	40,000
		Cash	60,000
Total Liabilities	10,00,000	Total Assets	10,00,000

QUESTION 2 : NOV 2018

The following is the information of XML Ltd. relate to the year ended 31st March

Gross Profit	20% of Sales
Net Profit	10% of Sales
Inventory Holding Period	3 months
Receivable collection period	3 months
Non Current Assets to Sales	1 : 4
Non Current Assets to Current Assets	1 : 2
Current Ratio	2 : 1
Non Current Liability to Current Liability	1 : 1
Share capital to Reserves and Surplus	4 : 1
Non current Assets as on 31st March	Rs 50,00,000

You are required to Calculate Cost of Goods sold, Net Profit, Inventory, Receivables and cash for the year ended 31st march, 2018.

SOLUTION :

Workings

$$\frac{Non\ \text{Current Assets}}{Current\ \text{Assets}} = \frac{1}{2}$$

Or $\frac{50,00,000}{Current\ Assets} = \frac{1}{2}$

So, Current Assets = Rs.1,00,00,000 Now further,

$\frac{Non\ Current\ Assets}{Sales} = \frac{1}{4}$

Or $\frac{50,00,000}{Sales} = \frac{1}{4}$

So, Sales = Rs.2,00,00,000

Calculation of Cost of Goods sold, Net profit, Inventory, Receivables and Cash:

Cost of Goods Sold (COGS):

Cost of Goods Sold = Sales- Gross Profit
= Rs.2,00,00,000 - 20% of Rs.2,00,00,000
= Rs.1,60,00,000

Net Profit = 10% of Sales = 10% of Rs.2,00,00,000
= Rs.20,00,000

Inventory:

$$Inventory\ Holding\ Period = \frac{12\ months}{Inventory\ Turnover\ Ratio}$$

$$4 = \frac{COGC}{Average\ Inventory}$$

$$4 = \frac{1,60,00,000}{Average\ Inventory}$$

Average or Closing Inventory =Rs.40,00,000

Receivables:

$$Receivable\ Collection\ Period = \frac{12\ months}{Receivables\ Turnover\ Ratio}$$

Or $Receivables\ Turnover\ Ratio = 12/3 = 4 = \frac{Credit\ Sales}{Average\ Accounts\ Receivables}$

Or $4 = \frac{2,00,00,000}{Average\ Accounts\ Receivables}$

So, Average Accounts Receivable/Receivables =Rs.50,00,000/-

Cash:

Cash* = Current Assets* - Inventory- Receivables Cash = Rs.1,00,00,000 – Rs.40,00,000 – Rs.50,00,000
= Rs.10,00,000

(it is assumed that no other current assets are included in the Current Asset)

QUESTION 3 : MAY 2019

Following Figures and ratios are related to a company Q Ltd.

i.	Sales for the year (All credit)	Rs 30,00,000
ii.	Gross Profit Ratio	25 %
iii.	Fixed Asset Turnover (Based on COGS)	1.5
iv.	Stock Turnover (Based on COGS)	6

v.	Liquid Ratio	1 : 1
vi.	Current Ratio	1.5 : 1
vii.	Debtors Collection Period	2 months
viii.	Reserves and surplus to capital	0.6 : 1
ix.	Capital Gearing Ratio	0.5
x.	Fixed Assets to Net worth	1.2 : 1

You are required to calculate
Closing Stock, Fixed Assets, Current Assets, Debtors and Net worth

SOLUTION :

(i) Calculation of Closing Stock:

Cost of Goods Sold = Sales 3 Gross Profit (25% of Sales)
= Rs.30,00,000 3 Rs.7,50,000
= Rs.22,50,000
Closing Stock = Cost of Goods Sold / Stock Turnover
= Rs.22,50,000/6 = Rs.3,75,000

(ii) Calculation of Fixed Assets:

Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
= Rs.22,50,000/1.5
= Rs.15,00,000

(iii) Calculation of Current Assets:

Current Ratio = 1.5 and Liquid Ratio = 1
Stock = 1.5 3 1 = 0.5
Current Assets = Amount of Stock × 1.5/0.5
= Rs.3,75,000 × 1.5/0.5 = Rs.11,25,000

(iv) Calculation of Debtors:

Debtors = Sales × Debtors Collection period /12
= Rs.30,00,000 × 2 /12
= Rs.5,00,000

(v) Calculation of Net Worth:

Net worth = Fixed Assets /1.2
= Rs.15,00,000/1.2 = Rs.12,50,000

QUESTION 4 : NOV 2019

Following information has been gathered from the books of tram ltd. the equity share of which is trading in the stock market @ Rs 14.

Particulars	Amount
Equity Share Capital (Face Value Rs 10)	10,00,000
10% Preference share Capital	2,00,000

Reserves	8,00,000
10% Debentures	6,00,000
Profit before interest and tax	4,00,000
Interest	60,000
Profit after tax	2,40,000

Calculate the following

1. Return on Capital Employed
2. Earnings per share
3. PE Ratio

SOLUTION :

i. Calculation of Return on capital employed (ROCE)

Capital employed = Equity Shareholders9 funds + Debenture + Preference shares

= Rs. (10,00,000 + 8,00,000 + 6,00,000 + 2,00,000)

= Rs.26,00,000

$$Return\ on\ capital\ employed\ \left[ROCE-\left(Pre-tax\right)\right]=\frac{PBIT}{Capital\ \text{Employed}}\ \text{x}\ 100$$

$$=\frac{Rs.\ 4,00,000}{Rs.\ 26,00,000}\ \text{x}\ 100 = 15.38\%\ \text{(approx.)}$$

$$Return\ on\ capital\ employed\ \left[ROCE-\left(Post-tax\right)\right]=\frac{\text{Pr}ofit\ \text{After tax}}{Capital\ \text{Employed}}\ \text{x}\ 100$$

ii. $\frac{Rs.\ 2,40,000}{Rs.\ 26,00,000}\ \text{x}\ 100 == 9.23\%\ \text{(approx)}$

iii. Calculation of Earnings per share

$$Earnings\ per\ share = \frac{Earnings\ available to\ equity\ shareholders}{No\ of\ \ equity\ shares}$$

$$= \frac{Profit\ after\ tax\ -\ preference\ Dividend}{No\ of\ \ equity\ shares}$$

$$= \frac{Rs.(2,40,000\ -\ 20,000)}{Rs.\ 1,00,000} == \text{Rs. } 2.20$$

iv. Calculation of PE ratio

$$PE = \frac{=\ Market\ Price\ per\ Share\ \left(MPS\right)}{Earning\ per\ Shares\ \left(EPS\right)}$$

$$= \frac{Rs.\ 14}{Rs.\ 2.20} == 6.364\ \text{(approx.)}$$

QUESTION 5 : NOV 2020

Following is the information for RM Co Ltd.

	Rs
Total Assets Employed	10,00,000
Direct Cost	5,50,000
Other operating cost	90,000

Goods are sold to the customer @150% of direct costs.

50% of the Assets being financed by borrowed capital at an interest cost of 8% per annum.
Tax Rate 30%
You are required to calculate

1. Net Profit Margin
2. Return on Assets
3. Assets Turnover
4. Return on Owners Equity

SOLUTION :

Computation of net profit

Particulars	**Rs.**
Sales (150% of Rs.5,50,000)	8,25,000
Direct Costs	5,50,000
Gross profit	2,75,000
Other Operating Costs	90,000
Operating profit (EBIT)	1,85,000
Interest changes (8% of Rs.5,00,000)	40,000
Profit before taxes (EBT)	1,45,000
Taxes (@ 30%)	43,500
Net profit after taxes (EAT)	1,01,500

1. $Net\ profit\ margin\ (After\ tax) = \frac{Profit\ after\ taxes}{Sales} = \frac{Rs.\ 1,01,500}{Rs.\ 8,25,000} = 0.12303\ or\ 12.303\%$

$Net\ profit\ margin\ (Before\ tax) = \frac{Profit\ before\ taxes}{Sales} = \frac{Rs.\ 1,45,00,000}{Rs.\ 8,25,000} = 0.17576\ or\ 17.576\%$

2. $Return\ on\ assets = \frac{EBIT\,(1 - T)}{Total\ Assets} = \frac{Rs.\ 1,85,0000}{Rs.\ 10,00,0000} = 0.1295 \text{ or } 12.95\%$

3. $Asset\ turnover = \frac{Sales}{Assets} = \frac{Rs.\ 8,25,000}{Rs.\ 10,00,000} = 0.825 \text{ times}$

4. $Return\ on\ owner's\ equity = \frac{Profit\ before\ taxes}{Owners\ equity} = \frac{Rs.\ 1,01,500}{50\%\ x\ Rs.\ 10,00,000} = 0.203 \text{ or } 20.3\%$

QUESTION 6 : JULY 2021

Masco Limited has furnished the following ratios and the information relating to the year ended 31st March, 2021

Sales	Rs 75,00,000
Return on net worth	25%
Rate of income tax	50%
Share capital to Reserves	6 : 4
Current Ratio	2.5
Net profit to sales (After tax)	6.5%

Inventory turnover (Based on COGS)	12
Cost of Goods sold	22,50,000
Interest on Debentures	Rs 75,000
Receivables (Including Debtors 1,25,000)	Rs 2,00,000
Payables	Rs 2,50,000
Bank Overdraft	Rs 1,50,000

You are required to

1. Calculate the operating expenses for the year 31st March
2. Prepare the Balance sheet in the following format

Liabilities	Rs	Assets	Rs
Share Capital Reserves and Surplus 15% Debentures Payables Bank Term Loan		Fixed Assets Current Assets Stock Receivables Cash	
Total		Total	

SOLUTION :

(a) Calculation of Operating Expenses for the year ended 31st March, 2021

Particulars		**(Rs.)**
Net Profit [@ 6.5% of Sales]		4,87,500
Add: Income Tax (@ 50%)		4,87,500
Profit Before Tax (PBT)		9,75,000
Add: Debenture Interest		75,000
Profit before interest and tax (PBIT)		10,50,000
Sales		75,00,000
Less: Cost of goods sold	22,50,000	
PBIT	10,50,000	33,00,000
Operating Expenses		42,00,000

(b) Balance Sheet as on 31st March, 2021

Liabilities	Rs	Assets	Rs
Share Capital	11,70,000	Fixed Assets	18,50,000
Reserves and Surplus	7,80,000	Current Assets	
15% Debentures	5,00,000	Stock	1,87,500
Payables	2,50,000	Receivables	2,00,000
Bank Overdraft(or Bank Term Loan)	1,50,000	Cash	6,12,500
Total	28,50,000	Total	28,50,000

Working Notes:

(i) Calculation of Share Capital and Reserves

The return on net worth is 25%. Therefore, the profit after tax of

Rs.4,87,500 should be equivalent to 25% of the net worth.

$$Net \text{ worth x } \frac{25}{100} = 4,87,500$$

$$\therefore \text{ Net worth } \frac{4,87,500 \text{ x } 100}{25} = 19,50,000$$

The ratio of share capital to reserves is 6:4

Share Capital = 19,50,000 x 6/10 = Rs.11,70,000 Reserves = 19,50,000 x 4/10 = Rs.7,80,000

(ii) Calculation of Debentures

Interest on Debentures @ 15% (as given in the balance sheet format) = Rs. 75,000

$$\therefore \text{ Debentures} = \frac{75,000 \text{ x } 100}{15} = \text{Rs. } 5,00,000$$

(iii) Calculation of Current Assets

Current Ratio = 2.5 Payables = Rs.2,50,000 Bank overdraft = Rs.1,50,000

Total Current Liabilities = Rs.2,50,000 + Rs.1,50,000 = Rs.4,00,000

∴ Current Assets = 2.5 x Current Liabilities = 2.5 × 4,00,000 = Rs.10,00,000

(iv) Calculation of Fixed Assets

Particulars	**Rs.**
Share capital	11,70,000
Reserves	7,80,000
Debentures	5,00,000
Payables	2,50,000
Bank Overdraft	1,50,000
Total Liabilities	28,50,000
Less: Current Assets	10,00,000
Fixed Assets	18,50,000

(v) Calculation of Composition of Current Assets

Inventory Turnover = 12

$$= \frac{Cost \ of \ goods \ sold}{Closing \ Stock} = 12$$

$$= Closing \ stock = \frac{22,50,000}{12} = \text{Closing Stock Rs. } 1,87,500$$

Particulars	**Rs.**
Stock	1,87,500
Receivables	2,00,000
Cash (balancing figure)	6,12,500
Total Current Assets	10,00,000

QUESTION 7 : DEC 2021

Following are the data in respect of ABC Industries for the year 31st March

Debt to Total Asset Ratio 0.40

Long term debt to Equity Ratio	30%
Gross profit margin on sales	20%
Accounts Receivable Period	36 days
Quick Ratio	0.9
Inventory Holding Period	55 days
Cost of Goods sold	Rs 64,00,000

Assume 360 days a year

Complete the following balance sheet

Liabilities	Rs	Assets	Rs
Equity Share Capital Reserves and Surplus Long term Debts Accounts Payable	20,00,000	Fixed Assets Inventories Accounts Receivable Cash	
Total		Total	

SOLUTION :

(1) Total liability = Total Assets =
50,00,000 Debt to Total Asset Ratio
= 0.40

$$\frac{Debt}{Total\ \text{Assets}} = 0.40$$

Or, $\frac{Debt}{50,00,000} = 0.40$

So, Debt = 20,00,000

(2) Total Liabilities = Rs. 50,00,000
Equity share Capital + Reserves + Debt = Rs. 50,00,000 So, Reserves =Rs. 50,00,000 – Rs. 20,00,000
So, Reserves & Surplus = Rs. 10,00,000

(3) $\frac{Long\ \text{term Debt}}{Equity\ \text{Shareholders Fund}} = 30\%*$

$$\frac{Long\ \text{term Debt}}{(20,00,000 + 10,00,000)} = 30\%$$

Long Term Debt = Rs. 9,00,000

(4) So, Accounts Payable = Rs. 20,00,000 - Rs. 9,00,000
Accounts Payable = Rs. 11,00,000

(5) Gross Profit to sales = 20%
Cost of Goods Sold = 80% of Sales = Rs. 64,00,000
Sales = 100/80 X 64,00,000 = 80,00,000

(6) $$Inventory\ Turnover = \frac{360}{55}$$

$$\frac{COGS}{Closing\ Inventory} = \frac{360}{55}$$

$$\frac{64,00,000}{Closing\ Inventory} = \frac{360}{55}$$

Closing inventory = 9,77,778

(7) Accounts Receivable period = 36 days

$$\frac{Accounts\ Receivable}{Credit\ Sales} \times 360 = 36$$

Accounts Receivable = 36/360 × credit sales

= 36 / 360 × 80,00,000 (assumed all sales are on credit)

Accounts Receivable = Rs. 8,00,000

(8) Quick Ratio = 0.9

$$\frac{Quick\ Assets}{Current\ Liabilities} = 0.9$$

$$\frac{Cash + Debtors}{11,00,000} = 0.9$$

Cash + 8,00,000 = Rs. 9,90,000

Cash = Rs. 1,90,000

(9) Fixed Assets = Total Assets- Current Assets = 50,00,000 - (9,77,778+8,00,000+1,90,000) = 30,32,222

Balance Sheet of ABC Industries as on 31st March 2021

Liabilities	**Rs.**	**Assets**	**Rs.**
Share Capital	20,00,000	Fixed Assets	30,32,222
Reserved surplus	10,00,000	Current Assets:	
Long Term Debt	9,00,000	Inventory	9,77,778
Accounts Payable	11,00,000	Accounts Receivables	8,00,000
		Cash	1,90,000
Total	**50,00,000**	**Total**	**50,00,000**

(*Note: Equity shareholders' fund represent equity in 'Long term debts to equity ratio'. The question can be solved assuming only share capital as 'equity')

QUESTION 8 : PAPER – MAY 2022

Following information and ratios are given for W Ltd. for the year ended 31st March

Equity shares of Rs 10 each	Rs 10 Lakhs
Reserves and surplus to shareholders fund	0.50
Sales / Shareholders fund	1.5

Current Ratio	2.5
Debtors Turnover Ratio	6
Stock Velocity	2 months
Gross profit Ratio	20%
Net working Capital Turnover Ratio	2.5

You are required to calculate

1. Shareholders Fund
2. Stock
3. Debtors
4. Current Liabilities
5. Cash Balance

SOLUTION :

(i) Calculation of Shareholders' Fund:

$$\frac{\text{Reserve \& Surplus}}{\text{Shareholders' Funds}} = 0.5$$

$$\frac{\text{Reserves \& Surplus}}{\text{Equity Share Capital + Reserves \& Surplus}} = 0.5$$

$$\frac{\text{Reserves \& Surplus}}{10{,}00{,}000 + \text{Reserves \& Surplus}} = 0.5$$

Reserve & Surplus = 5,00,000 + 0.5 Reserve & Surplus
0.5 Reserve & Surplus = 5,00,000
Reserve & Surplus = 10,00,000
Shareholders' funds = 10,00,000 +10,00,000
Shareholders' funds = Rs. 20,00,000

(ii) Calculation of Value of Stock:

$$\frac{Sales}{\text{Shareholders' Funds}} = 1.5$$

Sales = 1.5 × 20,00,000
Sales = 30,00,000
Gross Profit = 30,00,000 × 20% = 6,00,000
Cost of Goods Sold = 30,00,000 – 6,00,000
= Rs. 24,00,000

Stock velocity = 2 months

$$\frac{\text{Average Stock}}{\text{Cost of Goods Sold}} \times 12 = 2$$

$$\frac{\text{Average Stock}}{24{,}00{,}000} \times 12 = 2$$

$$Average\ \text{Stock} = 24,00,000 \times \frac{2}{12}$$

Average stock = Rs. 4,00,000

(iii) Calculation of Debtors:

Debtors Turnover Ratio = 6

$$\therefore \frac{Sales}{Average\ \text{Debtor}} = 6$$

$$\therefore \frac{30,00,000}{Average\ \text{Debtor}} = 6$$

Average Debtors = Rs. 5,00,000

(iv) Calculation of Current Liabilities:

Net Working Capital Turnover ratio = 2.5

$$\frac{Sales}{Current\ \text{Assets - Current Liabilities}} = 2.5$$

$$\frac{30,00,000}{Current\ \text{Assets - Current Liabilities}} = 2.5$$

Current Assets – Current Liabilities = 12,00,000 …….. (1)

Current Ratio = 2.5

$$\frac{Current\ \text{Assets}}{Current\ \text{Liabilities}} = 2.5$$

Current Assets = 2.5 Current Liabilities ……..(2)

From (1) & (2),

2.5 Current Liabilities – Current Liabilities = 12,00,000

1.5 Current Liabilities = 12,00,000

Current Liabilities = Rs. 8,00,000

(v) Calculation of Cash Balance:

Current Assets = 2.5 Current Liabilities

Current Assets = 2.5 (8,00,000)	= 20,00,000
(-) Debtors	(5,00,000)
(-) Stock	(4,00,000)
Cash Balance	**Rs. 11,00,000**

QUESTION 9 : RTP – MAY 2022

The company provides the following information relating to current financial year

Debtors Velocity	3 months
Creditors Velocity	2 months
Stock Turnover Ratio (On COGS)	1.5
Fixed Asset Turnover Ratio (On COGS)	4

Gross Profit Ratio	25%
Bills Receivable	Rs 25,000
Bills Payable	Rs 10,000
Gross Profit	Rs 4,00,000

The company has the practice to maintain excess stock of Rs 10,000 at the end than at the beginning of the year.

Calculate

1. Sales and cost of goods sold
2. Debtors
3. Creditors
4. Closing Stock
5. Fixed Assets

SOLUTION :

(I) Determination of Sales and Cost of goods sold:

$$Gross\ Profit\ Ratio == \frac{Gross\ \text{Profit}}{Sales} \text{ x } 100$$

Or $\frac{25}{100} = \frac{4,00,000}{Sales}$

$$Sales = \frac{4,00,000}{25} = \text{Rs. } 16,00,000$$

Cost of Goods Sold = Sales 3 Gross Profit

= Rs. 16,00,000 - Rs. 4,00,000 = Rs. 12,00,000

(ii) Determination of Sundry Debtors:

Debtors velocity is 3 months or Debtors9 collection period is 3 months,

So, Debtors' turnover ratio = $\frac{12 \text{ months}}{3 \text{ months}} = 4$

$$Debtors'\ turnover\ ratio = \frac{Credit\ \text{Sales}}{Average\ \text{Accounts Receivables}}$$

$$= \frac{Rs.\ 16,00,000}{Bills\ Receivable + SundryDebtors} = 4$$

Or, Sundry Debtors + Bills receivable = Rs. 4,00,000 Sundry Debtors = Rs. 4,00,000 3 Rs. 25,000 = Rs. 3,75,000

(iii) Determination of Sundry Creditors:

Creditors velocity of 2 months or credit payment period is 2 months

So, Creditors' turnover ratio= $\frac{12 \text{ months}}{3 \text{ months}} = 6$

Creditors turnover ratio= $\frac{Credits\ Sales}{Average\ Accounts\ Receivable}$

$$= \frac{Rs.\ 12,00,000}{Sundry\ Creditors + Bills\ Payables} = 6$$

So, Sundry Creditors + Bills Payable = Rs. 2,01,667 Or, Sundry Creditors + Rs. 10,000 = Rs. 2,01,667 Or, Sundry Creditors = Rs. 2,01,667 3 Rs. 10,000 = Rs. 1,91,667

(iv) Closing Stock

Stock Turnover Ratio

$$= \frac{Cost\ of\ Goods\ Sold}{Average\ Stock} = \frac{Rs.\ 12,00,000}{Average\ Stock} = 1.5$$

So, Average Stock = Rs. 8,00,000

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

$$= \frac{Opening\ Stock\ +\ Rs.10,000}{2} = \text{Rs. } 8,00,000$$

Or, Opening Stock = Rs. 7,95,000

So, Closing Stock= Rs. 7,95,000 + Rs. 10,000 = Rs. 8,05,000

(v) Calculation of Fixed Assets

$$Fixed\ Assets\ Turnover\ Ratio = \frac{Cost\ of\ Good\ sold}{Fixed\ Assets} = 4$$

Or = $\frac{Rs.\ 12,00,000}{Fixed\ Assets} = 4$ or, Fixed Assets = Rs. 3,00,000

Workings:

*Calculation of Credit purchases:

Cost of goods sold = Opening stock + Purchases 3 Closing stock Rs. 12,00,000 = Rs. 7,95,000 + Purchases - Rs. 8,05,000

Rs. 12,00,000 + Rs. 10,000 = Purchases Rs. 12,10,000 = Purchases (credit).

Assumption:

(i) All sales are credit sales

(ii) All purchases are credit purchase

(iii) Stock Turnover Ratio and Fixed Asset Turnover Ratio may be calculated either on Sales or on Cost of Goods Sold.

QUESTION 10 : NOV 2022

The following figures are related to the trading activities of M Ltd.

Total Assets	Rs 10,00,000
Debt to Total Assets	50%
Interest Cost	10% per year
Direct Cost	10 times of Interest cost
Operating Expenses	Rs 1,00,000

The goods are sold to customers at a margin of 50% on the direct cost.

Tax rate is 30%

You are required to calculate

1. Net profit Margin

2. Net Operating Profit Margin
3. Return on Assets
4. Return on Owners Equity

SOLUTION :

(i) Computation of Net Profit Margin

Debt = (10,00,000 x 50%) = Rs. 5,00,000

Interest cost = 5,00,000 × $\left(\frac{10}{100}\right)$ = 50,000

Direct cost = 50,000 x 10 = Rs. 5,00,000

Sales = 5,00,000 x 150% = Rs. 7,50,000

	Rs.
Gross profit = 7,50,000 3 5,00,000	= 2,50,000
Less: Operating expenses	= 1,00,000
∴ EBIT	= 1,50,000
Less: Interest	= 50,000
INTERMEDIATE EXAMINATION: NOVEMBER 2022	
∴ EBT	= 1,00,000
Less: Tax @ 30%	= 30,000
∴ PAT	= 70,000
Net profit margin	= $\left(\frac{70,000}{7,50,000}\right)$ x 100 = 9.33%

(ii) Net Operating Profit margin

Net operating profit margin = $\left(\frac{EBIT}{Sales}\right)$ x 100

$= \left(\frac{1,50,000}{7,50,000}\right)$ x 100 = 20%

(iii) Return on Assets

Return on Assets = $\left[\left(\frac{PAT + \text{Interest}}{Total\ \text{Assets}}\right)\right]$ x 100

$= \left[\left(\frac{1,20,000}{10,00,000}\right)\right]$ x 100 = 12%

OR

Return on Assets = $\frac{EBIT}{Assets}$ x 100

$= \left(\frac{1,50,000}{10,00,000}\right)$ x 100 = 15%

OR

$$= \frac{70,000}{10,00,000} \times 100 = 7\%$$

OR

$$= \left[\frac{1,50,000\ (1 - 0.3)}{10,00,000}\right] \times 100 = 10.5\%$$

(iv) Return on owner9s equity

$$Return = \frac{PAT}{Owners'\ equity} \times 100 = \frac{70,000}{5,00,000} \times 100 = 14\%$$

QUESTION 11 : RTP – NOV 2022

Following is the information for the year ended 31st March

Net Profit	8% of sales
Raw material consumed	20% of COGS
Direct Wages	10% of COGS
Stock of Raw material	3 months usage
Stock of Finished goods	6% of COGS
Gross Profit	15% of sales
Debt collection period	2 months
(All sales are on credit)	
Current Ratio	2 : 1
Fixed Assets to Current Assets	13 : 11
Fixed Assets to Sales	1 : 3
Long term Loans to Current Liabilities	2 : 1
Capital to Reserves and Surplus	1 : 4

You are required to prepare

Profit & Loss Statement for the year ended 31st March

Particulars	Rs	Particulars	Rs
To Direct Material Consumed To Direct Wages To Works overhead To Gross Profit		By Sales	
To Selling and Distribution Expenses To Net Profit		By Gross Profit	

Balance sheet as on 31st March

Liabilities	Rs	Assets	Rs
Share Capital Reserves and Surplus Loan Term Loans Current Liabilities		Fixed Assets Current Assets Stock of Raw material Stock of Finished Goods Debtors	1,30,00,000

		Cash	
Total		Total	

SOLUTION :

a) Working Notes:

I. Calculation of Sales = $\frac{Fixed\ Assets}{Sales} = \frac{1}{3}$

$\therefore \frac{26,000}{Sales} = \frac{1}{3}$ = Sales = Rs. 78,00,000

II. Calculation of Current Assets = $\frac{Fixed\ Assets}{Current\ Assets} = \frac{13}{11}$

$\therefore \frac{26,000}{Current\ Assets} = \frac{13}{11}$ = Sales = Rs. 22,00,000

III. Calculation of Raw Material Consumption and Direct Wages

	Rs.
Sales	78,00,000
Less: Gross Profit @ 15%	11,70,000
Works Cost	66,30,000

Raw Material Consumption (20% of Works Cost) = Rs. 13,26,000 Direct Wages (10% of Works Cost) = Rs. 6,63,000

iv. Calculation of Stock of Raw Materials (= 3 months usage)

= 13,26,000 × $\frac{13}{12}$ = Rs. 3,31,500

v. Calculation of Stock of Finished Goods (= 6% of Works Cost)

= 66,30,000 x $\frac{6}{100}$ = Rs. 3,97,800

vi. Calculation of Current Liabilities

$\frac{Current\ Assets}{Current\ Liabilities} = 2$

$\therefore \frac{22,000}{Current\ Liabilities} = 2$ = Sales = Rs. 11,00,000

vii. Calculation of Receivables

$Average\ collection\ period = \frac{Receivables}{Credit\ Sales}$ x 365

$\frac{Receivables}{78,00,000}$ x 365 = 60

→ Receivables = Rs. 12,82,191.78 or Rs. 12,82,192

viii. Calculation of Long term Loan

$\frac{Long\ term\ Loan}{Current\ Liabilities} = \frac{2}{1} = \frac{Long\ term\ Loan}{11,00,000}\ \frac{2}{1} \rightarrow$ Long Term loan= Rs. 22,00,000

ix. Calculation of Cash Balance

		Rs.
Current assets		22,00,000
Less: Receivables	12,82,192	
Raw materials stock	3,31,500	
Finished goods stock	3,97,800	20,11,492
Cash balance		1,88,508

x. Calculation of Net worth

Fixed Assets		26,00,000
Current assets		22,00,000
Total Assets		48,00,000
Less: Long term Loan	22,00,000	
Current Liabilities	11,00,000	33,00,000
Net worth		15,00,000

Net worth = Share capital + Reserves = 15,00,000

$$Also,\ \frac{1}{4} = \frac{share\ capital}{Reserves\ and\ Surplus}$$

So, Share Capital = 15,00,000 x $\frac{1}{4}$ = Rs. 12,00,000

Profit and Loss Account of PQR Ltd. for the year ended 31st March, 2021

Particulars	Rs.	Particulars	Rs.
To Direct Materials	13,26,000	By Sales	78,00,000
To Direct Wages	6,63,000		
To Works (Overhead) (Balancing figure)	46,41,000		
To Gross Profit c/d	11,70,000		
	78,00,000		78,00,000
To Selling and Distribution Expenses (Balancing figure)	5,46,000	By Gross Profit b/d	11,70,000
To Net Profit (8% of Sales)	6,24,000		
	11,70,000		11,70,000

Balance Sheet of PQR Ltd. as at 31st March, 2021

Liabilities	Rs	Assets	Rs
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets	
Loan Term Loans	22,00,000	Stock of Raw material	3,31,500
Current Liabilities	11,0,000	Stock of Finished Goods	3,97,800
		Receivables	12,82,192
		Cash	1,88,508
Total	48,00,000	Total	48,00,000

QUESTION 12 : PAPER – NOV 2022

The Following figures are related to the trading activities of M Ltd

Total Assets	Rs. 10,00,000
Debt to total assets	50%
Interest Cost	10% per year
Direct cost	10 times of the interest cost
Operating Exp.	Rs. 1,00,000

The goods are sold to customers at a margin of 50% on the direct cost

Tax Rate is 30%

You are required to calculate

i. Net profit margin
ii. Net operating profit margin
iii. Return on assets
iv. Return on owner's equity

SOLUTION :

(i) Computation of Net Profit Margin

Debt = (10,00,000 x 50%) = Rs. 5,00,000

Interest cost = 5,00,000 x $\left(\frac{10}{100}\right)$ = Rs. 50,000

Direct cost = 50,000 x 10 = Rs. 5,00,000

Sales = 5,00,000 x 150% = Rs. 7,50,000

	Rs.
Gross profit = 7,50,000 – 5,00,000	= 2,50,000
Less: Operating expenses	= 1,00,000
∴ EBIT	= 1,50,000
Less: Interest	= 50,000
∴EBT	= 1,00,000
Less : Tax @ 30%	= 30,000
∴PAT	= 70,000

Net profit margin = $\left(\frac{70,000}{7,50,000}\right)$ x 100 = 9.33%

(ii) Net Operating Profit margin

Net operating profit margin = $\left(\frac{EBIT}{Sales}\right)$ x 100

= $\left(\frac{1,50,000}{7,50,000}\right)$ x 100 = 20%

(iii) Return on Assets

Return on Assets = $\left[\left(\frac{PAT + \text{Interest}}{Total\ \text{Assets}}\right)\right]$ x 100

= $\left[\left(\frac{1,20,000}{10,00,000}\right)\right]$ x 100 = 12%

OR

Return on Assets $= \frac{EBIT}{Assets} \times 100$

$= \frac{1,50,000}{10,00,000} \times 100 = 15\%$

OR

$= \frac{70,000}{10,00,000} \times 100 = 7\%$

OR

$= \left[\frac{1,50,000\ (1 - 0.3)}{10,00,000}\right] \times 100 = 10.5\%$

(iv) Return on owner's equity

Return $= \left[\frac{PAT}{Owner's\ equity}\right] \times 100$

$= \left[\frac{70,000}{5,00,000}\right] \times 100 = 14\%$

QUESTION 13 : PAPER – MAY 2023

Following information and ratios are given is respect of AQUA Ltd for the year ended 31st March 2023

Current ratio	4.0
Acid test ratio	2.5
Inventory turnover ratio (based on sales)	6
Average collection period (days)	70
Earnings per share	Rs. 3.5
Current liabilities	Rs. 3,10,000
Total assets turnover ratio (based on sales)	0.96
Cash ratio	0.43
Proprietary ratio	0.48
Total equity dividend	Rs. 1,75,000
Equity dividend coverage ratio	1.60

Assume 360 days in a year

You are required to complete Balance Sheet as on 31st March 2023

Balance Sheet as on 31st March 2023

Liabilities	**Rs.**	**Assets**	**Rs.**
Equity Share capital (Rs 10 per share)	Xxx	Fixed assets	Xxx
Reserves and surplus	Xxx	Inventory	Xxx
Long-term debt	Xxx	Debtors	Xxx
Current Liabilities	3,10,000	Loans & advances	Xxx

		Cash & bank	Xxx
Total	xxx	Total	Xxx

SOLUTION :

(i) Current Ratio = 4

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 4$$

$$\therefore \frac{\text{Current Assets}}{3,10,000} = 4$$

$\therefore$ Current Assets = Rs. 12,40,000

(ii) Acid Test Ratio = 2.5

$$\frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}} = 2.5$$

$$\therefore \frac{12,40,000 - \text{Inventory}}{3,10,000} = 2.5$$

$\therefore$ 12,40,000 – Inventory = Rs. 7,75,000

Inventory = Rs. 4,65,000

(iii) Inventory Turnover Ratio (on Sales) = 6

$$\frac{Sales}{Inventory} = 6$$

$$\frac{Sales}{4,65,000} = 6$$

$\therefore$ Sales = Rs. 27,90,000

(iv) Debtors Collection Period = 70 days

$\therefore$ (Debtors / sales) x 360 = 70

$\therefore$ (Debtors / 27,90,000) x 360 = 70

Debtors = Rs. 5,42,500

(v) Total Assets Turnover Ratio (on Sales) = 0.96

$$\therefore \frac{Sales}{Total\ Assets} = 0.96$$

$$\therefore \frac{27,90,000}{Total\ Assets} = 0.96$$

Total Assets = Rs. 29,06,250

(vi) Fixed Assets (FA) = Total Assets – Current Assets

= 29,06,250 – 12,40,000

Fixed Assets = Rs. 16,66,250

$$\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current Liabilities}} = 0.43$$

(vii) $\therefore \frac{Cash}{3{,}10{,}000} = 0.43$

$\therefore$ Cash = Rs. 1,33,000

(viii) $$\text{Proprietary Ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}} = 0.48$$

$\therefore$ Proprietary Fund = Rs. 13,95,000

(ix) Equity Dividend Coverage Ratio = 1.6

Or $\frac{EPS}{DPS} = \frac{3.5}{DPS}$

$\therefore$ DPS = Rs. 2.1875

$$2.1875 = \frac{1{,}75{,}000}{\text{Number of Equity Shares}}$$

$\therefore$ Number of Equity Shares = 80,000

$\therefore$ Equity Share Capital = 80,000 x 10 = Rs. 8,00,000

$\therefore$ Reserves &Surplus = 13,95,000 - 8,00,000 = Rs. 5,95,000

(x) Loans and Advances = Current Assets - (Inventory + Receivables + Cash & Bank)
= Rs. 12,40,000 - (Rs. 4,65,000 + 5,42,500 + 1,33,300) = Rs. 99,200

Balance Sheet as on 31st March 2023

Liabilities	**Rs.**	**Assets**	**Rs.**
Equity Share Capital (Rs. 10 per share)	8,00,000	Fixed Assets	16,66,250
Reserves & Surplus	5,95,000	Inventory	4,65,000
Long-term debt *(B/F)	12,01,250	Receivables	5,42,500
Current Liabilities	3,10,000	Loans & Advances	99,200
		Cash & Bank	1,33,300
Total	**29,06,250**		**29,06,250**

QUESTION 14 : RTP – MAY 2023

From the following information, find out the missing figures and rewrite the balance sheet Mukesh Enterprises

Current Ratio	2 : 1
Acid Test Ratio	3 : 2
Reserves and surplus	20% of share capital
Long term debt	45% of net worth
Stock velocity ratio	1.5 months
Receivables turnover ratio	2 months

You may assume that closing receivables are Average Receivables

Gross profit Ratio 20%
Sales (25% cash and Balance credit) Rs 21,00,000
Closing stock is Rs 40,000 more than opening Stock
Accumulated Depreciation is 1/6 of the original cost of Fixed Assets

Balance sheet

Liabilities	**Rs**	**Assets**	**Rs**
Equity share capital		Fixed Assets	
Reserves and Surplus		Less Accumulated Depreciation	
Long Term Loans	6,75,000	Net Fixed Assets	
Bank Overdraft	60,000	Stock	
Creditors		Debtors	
		Cash	
Total		Total	

SOLUTION :

Liabilities	Rs	Assets	Rs
Equity share capital	12,50,000	Fixed Assets	20,58,000
Reserves and Surplus	2,50,000	Less Accumulated Depreciation	(3,43,000)
Long Term Loans	6,75,000	Fixed Assets (WDV)	17,15,000
Bank Overdraft	60,000	Stock	2,30,000
Payable	4,00,000	Receivables	2,62,500
		Cash	4,27,500
Total	26,35,000	Total	26,35,000

Working Notes:

(i) Sales Rs. 21,00,000
Less: Gross Profit (20%) Rs. 4,20,000
Cost of Goods Sold (COGS) Rs. 16,80,000

(ii) Receivables Turnover Velocity = $\frac{Average\ Receivables}{Credit\ Sales}$ x 12

$$2 = \frac{Average\ Receivables}{Rs.\ 21,00,000 \times 75\%} \times 12$$

$$\text{Average Receivables} = \frac{Rs.\ 21,00,000 \times 75\% \times 2}{12}$$

Average Receivables = Rs. 2,62,500
Closing Receivables = Rs. 2,62,500

(iii) Stock Turnover Velocity = $\frac{Average\ Stock}{COGS}$ x 12

Or 1.5 = $\frac{Average\ Stock}{Rs.\ 16,80,000}$ x 12

Or Average Stock = $\frac{Rs.\ 16,80,000 \times 1.5}{Rs.\ 12}$

Or Average Stock = Rs. 2,10,000

$\frac{Opening\ Stock\ +\ Closing\ Stock}{2}$ = Rs. 2,10,000

Opening Stock + Closing Stock = Rs. 4,20,000.....(1)

Also, Closing Stock-Opening Stock = Rs. 40,000.....(2)

Solving (1) and (2), we get closing stock = Rs. 2,30,000

(iv) Current Ratio= $\frac{Current\ Assets}{Current\ Liabilities} = \frac{Stock\ +\ Receivables\ +\ Cash}{Bank\ Overdraft\ +\ Creditors}$

Or 2 = $\frac{Rs.\ 2,30,000 + Rs.\ 2,62,500 + Cash}{Rs.\ 60,000 + Creditors}$

Or Rs. 1,20,000 + 2 Payables = Rs. 4,92,500 + Cash

Or 2 Payables – Cash.= Rs. 3,72,500

Or Cash = 2 Payables – Rs. 3,72,500.....(3)

Acid Test Ratio = $\frac{Current\ Assests\ -\ Stock}{Current\ Liabilities} = \frac{Debtor\ +\ Cash}{Current\ Liabilities}$

Or $\frac{3}{2} = \frac{Rs.\ 2,62,500 + Cash}{60,000 + Creditors}$

Or Rs. 1,80,000 + 3 Payables = Rs. 5,25,000 + 2 Cash

Or 3 Payables – 2 Cash = Rs. 3,45,000 ..... (4)

Substitute (3) in (4)

Or 3 Payables – 2(2 Payables – Rs. 3,72,500) = Rs. 3,45,000

Or 3 Payables – 4 Payables + Rs. 7,45,000= Rs. 3,45,000

(Payables) = Rs. 3,45,000 – Rs. 7,45,000

Payables = Rs. 4,00,000

So, Cash = 2 x Rs. 4,00,000 – Rs. 3,72,5000

Cash = Rs. 4,27,500

(v) Long term Debt = 45% of Net Worth

Or Rs. 6,75,000 = 45% of Net Worth

Net Worth = Rs. 15,00,000

(vi) Equity Share Capital (ESC) + Reserves = Rs. 15,00,000

Or ESC + 0.2ESC = Rs. 15,00,000

Or 1.2 ESC = Rs. 15,00,000

Equity Share Capital (ESC) = Rs. 12,50,000

(vii) Reserves = 0.2 x Rs. 12,50,000

Reserves = Rs. 2,50,000

(viii) Total of Liabilities=Total of Assets

Or Rs. 12,50,000 + Rs. 2,50,000 + Rs. 6,75,000 +Rs. 60,000 + Rs. 4,00,000 + Fixes Assets(FA) (WDV) + Rs. 2,30,000 + Rs. 2,62,000 + Rs. 4,27,500
Or Rs. 26,35,000 = Rs. 9,20,000 + FA(WDV)
FA (WDV) = Rs. 17,15,000
Now FA(Cost) – Depreciation = FA(WDV)
Or FA(Cost) – FA(Cost)/6 = Rs. 17,15,000
Or 5 FA(Cost)/6 = Rs. 17,15,000
Or FA(Cost) = Rs. 17,15,000x 6/5
So, FA(Cost) = Rs. 20,58,000
Depreciation = Rs. 20,58,000/6 = Rs. 3,43,000

QUESTION 15 : PAPER – NOV 2023

You are available with following information of Brave Ltd

Debtor's velocity	3 months
Stock velocity	6 months
Creditor's velocity	2 months
Gross profit ratio	20%

The gross profit for the year ended 31st March 2023 was Rs. 10,00,000. Stock for the same period was Rs. 40,000 more than what it was at the beginning of the year. Bills receivable were Rs. 1,20,000

From the above information, you are required to calculate:

i. Sales
ii. Sundry debtors
iii. Closing stock

SOLUTION :

I) Determination of Sales :

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

$$\text{OR}, \frac{20}{100} = \frac{10,00,000}{\text{Sales}}$$

$$\text{OR Sales} = \frac{10,00,00,000}{20} = 50,00,000$$

Cost of Goods Sold = Sales – Gross Profit

= 50,00,000 – 10,00,000 = 40,00,000

II) Determination of Sundry Debtors :

Debtors' Velocity Is 3 Months or debtors collection period is 3 months,

$$\text{So, debtors' turnover Ratio} = \frac{12 \text{ Months}}{3 \text{ Months}} = 4$$

$$\text{Debtors' turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

$$= \frac{50,00,000}{\text{Bills Receivable+Sundry Debtors}}$$

Or, Sundry Debtors + Bills Receivable = 12,50,000
Sundry Debtors = = 12,50,000 – 1,20,000 = 11,30,000

III) Determination of Closing Stock :
Stock Velocity is 6 months so stock turnover Ratio = 2

$$\text{Stock turnover Ratio} = \frac{\text{Cost of good sold}}{\text{Average Stock}} = \frac{40,00,000}{\text{Average Stock}} = 2$$

So, Average Stock = 20,00,000

$$\text{Now Average Stock} = \frac{\text{Opening Stock+Closing Stock}}{2}$$

$$\text{Or} = \frac{\text{Opening Stock+(Opening Stock+40,000)}}{2} = 20,00,000$$

Or Opening Stock + 20,000 = 20,00,000
Or Opening Stock = 19,80,000
So, Closing Stock = 19,80,000 + 40,000 = 20,20,000

QUESTION 16 : RTP – NOV 2023

From the following table of financial ratios of Prabhu Chemicals, comment on various ratios given at the end

Ratios	Current Year	Previous year	Industry Standard
Liquidity Ratio			
Current Ratio	2.1	2.3	2.4
Quick Ratios	1.4	1.8	1.4
Receivable Turnover Ratio	8	9	8
Inventory Ratio	8	9	5
Receivable Collection Period	46 days	41 days	46 days
Operating Profitability			
Operating Income – ROI	24%	21%	18%
Operating Profit Margin	18%	18%	12%
Financing Decisions			
Debt Ratio	45%	44%	60%
Return			
Return on Equity	26%	28%	18%

Comment on the following aspects of Prabhu Chemicals Limited

1. Liquidity
2. Operating Profit

3. Financing
4. Return to shareholders

SOLUTION :

Ratios	Comment
Liquidity	Current ratio has improved from last year and matching the industry average. Quick ratio also improved than last year and above the industry average. The reduced inventory levels (evidenced by higher inventory turnover ratio) have led to better quick ratio in FY 2022 compared to FY 2021. Further the decrease in current liabilities is greater than the collective decrease in inventory and debtors as the current ratio have increase from FY2021 to FY 2022.
Operating Profits	Operating Income-ROI reduced from last year, but Operating Profit Margin has been maintained. This may happen due to decrease in operating cost. However, both the ratios are still higher than the industry average
Financing	The company has reduced its debt capital by 1% and saved earnings for equity shareholders. It also signifies that dependency on debt compared to other industry players (60%) is low.
Return to the shareholders	Prabhu's ROE is 26 per cent in 2021 and 28 per cent in 2022 compared to an industry average of 18 per cent. The ROE is stable and improved over the last year

QUESTION 17 : RTP – MAY 2024

From the following information and ratios, PREPARE the Balance Sheet as on 31st March 2023 and Income Statement for the year ended on that date for Limelite & Co.

Gross Profit	Rs. 1,20,000
Shareholders' Funds	Rs. 5,00,000
Gross Profit margin	40%
Net Profit Margin	10%
PBIT to PBT	2:1
Credit sales to Total sales	80%
Total Assets turnover	0.4 times
Inventory turnover (Use sales as turnover)	5 times
Average collection period (a 360 days year)	30 days

Current ratio	2
Operating expenses (excluding interest)	Rs. 60,000
Long-term Debt to Equity	40%
Tax	Nil

SOLUTION :

Gross Profit = Rs. 1,20,000

Gross Profit Margin = 40%

∴ Sales $= \frac{Gross\ Profit}{Gross\ Profit\ Margin}$ = Rs. 1,20,000/0.40 = Rs.3,00,000

Net profit (PBT) = 3,00,000 x 10% = Rs. 30,000

PBIT/PBT = 2

PBIT = 2 x 30,000

PBIT = 60,000

Interest = 60,000 – 30,000 = Rs. 30,000

Credit Sales to Total Sales = 80%

∴ Credit Sales = Rs. 3,00,000×0.80 = Rs. 2,40,000

Total Assets Turnover = 0.4 times

∴ Total Assets $= \frac{Sales}{Total\ Assets\ Turnover}$

$= \frac{Rs.\ 3,00,000}{0.4}$ = Rs. 7,50,000

Inventory turnover = 5 times

Inventory $= \frac{Sales}{Inventory\ turnover} = \frac{3,00,000}{5}$

Average Collection Period = 30 days

∴ Debtors turnover $= \frac{Credit\ Sales}{Debtors\ turnover} = \frac{Rs.\ 2,40,000}{12}$ = Rs.20,000

Current ratio = 2

2 $= \frac{Debtors\ +\ Inventory\ +\ Cash\ (Current\ Assets)}{Creditors\ (Current\ Liabilities)}$

2 Creditors = (Rs. 20,000 + Rs. 60,000 + Cash)

2 Creditors = Rs. 80,000 + Cash ---------- (i)

Long-term Debt to Equity = 40%

Shareholders' Funds (Equity) = Rs. 5,00,000

∴ Long-term Debt = Rs. 5,00,000 × 40% = Rs. 2,00,000

Creditors = Total Assets – (Shareholder's fund + Long term debt)

= Rs. 7,50,000 – (5,00,000 + 2,00,000) = Rs. 50,000

∴ Cash = (Rs. 50,000×2) – Rs. 80,000 = Rs. 20,000 [From equation (i)]

Income Statement

	Rs.
Sales	3,00,000
Less: Cost of Goods Sold	1,80,000
Gross Profit	1,20,000
Less: Operating Expenses	60,000
PBIT	60,000
Less: Interest	30,000
Net Profit	30,000

Balance Sheet

Liabilities	**Rs.**	**Assets**		**Rs.**
Equity share capital	5,00,000	Fixed asset (bal. fig.)		6,50,000
Long term debt	2,00,000	Current assets:		
Current liability	50,000	Stock	60,000	
		Receivables	20,000	
		Cash	20,000	1,00,000
	7,50,000			7,50,000

QUESTION 18 : PAPER – MAY 2024

Theme Ltd Provides you the following information

12.5% Debt	Rs 45,00,000
Debt to Equity Ratio	1.5 : 1
Return on shareholders Fund	54%
Operating Ratio	85%
Ratio of operating Expenses to Cost of Goods sold	2 : 6
Tax Rate	25%
Fixed Assets	Rs 39,00,000
Current Ratio	1.8 : 1

You are required to calculate

1. Interest Coverage Ratio
2. Gross Profit Ratio
3. Current Ratio

SOLUTION :

1. Interest Coverage Ratio $= \frac{\text{EBIT}}{\text{Interest}} = \frac{27,22,500}{5,62,500} = 4.84$ times
2. Gross Profit Ratio $= \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = \frac{1,81,50,000 - 1,15,70,625}{1,81,50,000} \times 100 = 36.25\%$
3. Current Ratio $= 81,00,000$

Working Notes

1) Debt to Equity = 1.5 : 1

i.e. $\frac{\text{Debt}}{\text{Equity}} = \frac{1.5}{1}$ ie $\frac{4500000}{\text{Equity}} = \frac{1.5}{1}$ So, Equity = 30,00,000

2) Return on Shareholder Fund = 54%

i.e. $\frac{\text{PAT}}{\text{Shareholder's fund}} \times 100 = 54$

So , PAT = 30,00,000 × 54% = 16,20,000

3)

EBIT	27,22,500	
- Interest	562500	(4500,000 × 12.5%)
EBT	21,60,000	100%
-Tax	540,000	25%
EAT	16,20,000	75%

4) Operating Ratio = 85%

i.e. Operating Profit = 15%

i.e. $\frac{\text{EBIT}}{\text{Sales}}$ x 100 = 15% $\frac{27,22,500}{\text{Sales}}$ x 100 = 15% therefore Sales = 1,81,50,000

therefore Operating Cost = 1,81,50,000 – 27,22,500 = 1,54,27,500

5.) Op Exp to Cost of Goods = 2 : 6

Operating Expenses $\frac{1,54,27,500}{8} \times 2$ = 38,56,875

& Cost of Goods Sold = 1,15,70,625

6) Current Ratio = 1 : 8 : 1

i.e. $\frac{\text{CA}}{\text{CL}} = \frac{1.8}{1}$ ie CA = 1.8 CL

7) Assets = Liabilities

FA + CA = Equity + Debt + CL

39,00,000 + 1.8CL = 30,00,000 + 45,00,000 + CL

i.e. 0.8 CL = 36,00,000

therefore CL = 45,00,000

i.e. CA = 45,00,000 x 1.8 = 81,00,000

QUESTION 19 :

Following information relate to a concern:

Debtors Velocity	3 months
Credits Velocity	2 months
Stock Turnover Ratio	1.5
Gross Profit Ratio	25%
Bills Receivables	Rs. 25,000
Bills Payables	Rs. 10,000
Gross Profit	Rs. 4,00,000

Fixed Assets to turnover Ratio	4

Closing stock of the period is Rs. 10,000 above the opening stock. CALCULATE

(i) Sales and cost of goods sold
(ii) Sundry Debtors
(iii) Sundry Creditors
(iv) Closing Stock
(v) Fixed Assets (MTP 5 Marks, Oct 18, RTP May 22, Old & New SM)

SOLUTION :

(i) Determination of Sales and Cost of goods sold:

Gross Profit Ratio== $\frac{Gross\ Profit}{Sales}$ x 100

Or $\frac{25}{100} = \frac{4,00,000}{Sales}$

Sales = $\frac{4,00,000}{25}$ = Rs. 16,00,000

Cost of Goods Sold = Sales 3 Gross Profit

= Rs. 16,00,000 - Rs. 4,00,000 = Rs. 12,00,000

(ii) Determination of Sundry Debtors:

Debtors velocity is 3 months or Debtors9 collection period is 3 months

So, Debtors9 turnover ratio = $\frac{12\ months}{3\ months} = 4$

Debtors' turnover ratio = $\frac{Credits\ Sales}{Average\ Accounts\ Receivable}$

= $\frac{Rs.\ 16,00,000}{Bills\ Receivable + SundryDebtors} = 4$

Or, Sundry Debtors + Bills receivable = Rs. 4,00,000 Sundry Debtors = Rs. 4,00,000 3 Rs. 25,000 = Rs. 3,75,000

(iii) Determination of Sundry Creditors:

Creditors velocity of 2 months or credit payment period is 2 months

So, Creditors9 turnover ratio= $\frac{12\ months}{3\ months} = 6$

Creditors turnover ratio= $\frac{Credits\ Sales}{Average\ Accounts\ Receivable}$

= $\frac{Rs.\ 12,10,000}{Sundry\ Creditors + Bills\ Payables} = 6$

So, Sundry Creditors + Bills Payable = Rs. 2,01,667 Or, Sundry Creditors + Rs. 10,000 = Rs. 2,01,667

Or, Sundry Creditors = Rs. 2,01,667 3 Rs. 10,000 = Rs. 1,91,667

(iv) Closing Stock

Stock Turnover Ratio

$$= \frac{Cost\ of\ Goods\ Sold}{Average\ Stock} = \frac{Rs.12,00,000}{Average\ \text{Stock}} = 1.5$$

So, Average Stock = Rs. 8,00,000

$$\text{Now Average Stock} = \frac{Opening\ Stock + Closing\ Stock}{2}$$

$$= \frac{Opening\ Stock + \text{Rs. } 10,000}{2} = \text{Rs. } 8,00,000$$

Or, Opening Stock = Rs. 7,95,000

So, Closing Stock= Rs. 7,95,000 + Rs. 10,000 = Rs. 8,05,000

(v) Calculation of Fixed Assets

$$\text{Fixed Assets Turnover Ratio} = \frac{Cost\ of\ Good\ sold}{Fixed\ \text{Assets}} = 4$$

$$\text{Or } \frac{Rs.\ 12,00,000}{Fixed\ \text{Assets}} = 4 \text{ or Fixed Asset = Rs. 3,00,000.}$$

Workings:

*Calculation of Credit purchases:

Cost of goods sold = Opening stock + Purchases 3 Closing stock Rs. 12,00,000 = Rs. 7,95,000 + Purchases 3 Rs. 8,05,000

Rs. 12,00,000 + Rs. 10,000 = Purchases Rs. 12,10,000 = Purchases (credit).

Assumption:

(i) All sales are credit sales

(ii) All purchases are credit purchase

(iii) Stock Turnover Ratio and Fixed Asset Turnover Ratio may be calculated either on Sales or on Cost of Goods Sold.

QUESTION 20 :

The following accounting information and financial ratios of A&R Limited relate to the year ended 31st March, 2020:

Inventory Turnover Ratio	6 Times
Creditors Turnover Ratio	10 Times
Debtors Turnover Ratio	8 Times
Current Ratio	2.4
Gross Profit Ratio	25%

Total sales Rs.6,00,00,000; cash sales 25% of credit sales; cash purchases Rs.46,00,000; working capital Rs.56,00,000; closing inventory is Rs.16,00,000 more than opening inventory.

You are required to CALCULATE:

(i) Average Inventory

(ii) Purchases

(iii) Average Debtors

(iv) Average Creditors
(v) Average Payment Period
(vi) Average Collection Period
(vii) Current Assets
(viii) Current Liabilities.
Take 365 days a year [MTP 10 Marks, May 20]

SOLUTION :

(i) Computation of Average Inventory

Gross Profit = 25% of Rs.6,00,00,000 = Rs.1,50,00,000

Cost of goods sold (COGS) = Sales - Gross Profit

= Rs.6,00,00,000 - Rs.1,50,00,000

= Rs.4,50,00,000

Inventory Turnover Ratio= $\frac{CPGS}{Average\ \text{Inventory}}$

= 6 = $\frac{Rs.\ 4,50,000,000}{Average\ \text{Inventory}}$

Average inventory = Rs.75,00,000

Computation of Purchases

Purchases = COGS + (Closing Stock 3 Opening Stock)

= Rs.4,50,00,000 + 16,00,000*

Purchases = Rs.4,66,00,000

* Increase in Stock = Closing Stock 3 Opening Stock = Rs.16,00,000

Computation of Average Debtors

Let Credit Sales be Rs.100, Cash sales = $\frac{25}{100}$ x 100 = Rs. 25

Total Sales = 100 + 25= Rs.125

Total sales are Rs.125 credit sales is Rs.100

If total sales is Rs.6,00,00,000, then credit sales is= $\frac{Rs.\ 6,00,00,000}{125}$ x 100

Credit Sales = Rs.4,80,00,000

Cash Sales = (Rs.6,00,00,000 3 Rs.4,80,00,000) = Rs.1,20,00,000

Debtors Turnover Ratio=

$\frac{Net\ \text{Credit sales}}{Average\ \text{debtors}} = 8$

= $\frac{Rs.\ 4,80,00,000}{Average\ \text{debtors}} = 8$

Average debtors = $\frac{Rs.\ 4,80,00,000}{8}$

Average Debtors = Rs.60,00,000

(ii) Computation of Average Creditors

Credit Purchases = Purchases - Cash Purchases

= Rs.4,66,00,000 - Rs.46,00,000 = Rs.4,20,00,000

$$\text{Creditors Turnover Ratio} = \frac{credit\ purcheses}{average\ creditors}$$

$$10 = \frac{Rs.\ 4,20,00,000}{average\ \text{creditors}}$$

Average Creditors = Rs.42,00,000

(iii) Computation of Average Payment Period

$$\text{Average Payment Period} = \frac{Average\ creditors}{average\ Daily\ Credit\ Purchases}$$

$$= \frac{Rs.\ 42,00,000}{\frac{Credit\ \text{Purchases}}{365}} = \frac{Rs.\ 42,00,000}{\frac{Rs.\ 4,20,00,0000}{365}}$$

$$\frac{Rs.\ 42,00,0000}{Rs.\ 4,20,00,000} \times 365 = 36.5 \text{ days}$$

Alternatively

Average Payment Period = 365/Creditors Turnover Ratio

$$= \frac{365}{10} = 36.5 \text{ days}$$

(iv) Computation of Average Collection Period

Average Collection Period=

$$\frac{Average\ Debtors}{Net\ Credit\ Sales} \times 365$$

$$= \frac{Rs.\ 60,00,000}{Rs.\ 4,80,00,000} \times 365 = 45.625 \text{ days}$$

Alternatively

$$Average\ collection\ period = \frac{365}{Debtors\ Turnover\ Ratio}$$

$$= \frac{365}{8} = 45.625 \text{ days}$$

(v) Computation of Current Assets

$$\text{Current Ratio} = \frac{Current\ Assets\ (CA) =}{Current\ Liabilities\ (CL)}$$

2.4 Current Liabilities = Current Assets

$$\text{Or CL} = \frac{CA}{2.4}$$

Further, Working capital = Current Assets - Current liabilities

So, Rs.56,00,000 = CA - $\frac{CA}{2.4}$

Rs.56,00,000 = $\frac{1.4\ CA}{2.4}$ = Or, 1.4 CA = Rs.1,34,40,000

CA = Rs.96,00,000

(vi) Computation of Current Liabilities

Current liabilities

$\frac{Rs.\ 96,00,000}{2.4}$ Rs. 40,00,000

QUESTION 21 :

Assuming the current ratio of a Company is 2, STATE in each of the following cases whether the ratio will improve or decline or will have no change:

(i) Payment of current liability
(ii) Purchase of fixed assets by cash
(iii) Cash collected from Customers
(iv) Bills receivable dishonored
(v) Issue of new shares (RTP Nov 18)

SOLUTION :

$Current\ Ratio = \frac{Current\ \text{Assets (CA)}}{Current\ \text{Liabilties (CL)}} = 2$ i.e. 2:1

S. No	Situation	Improve/ Decline/ No Change	Reason
(i)	Payment of Current liability	Current Ratio will improve	Let us assume CA is Rs. 2 lakhs & CL is Rs. 1 lakh. If payment of Current Liability = Rs. 10,000 then, CA = 1, 90,000 CL = 90,000. Current Ratio = 1,90,000 / 90,000 = 2.11 : 1. When Current Ratio is 2:1 Payment of Current liability will reduce the same amount in the numerator and denominator. Hence, the ratio will improve.
(ii)	Purchase of Fixed Assets by cash	Current Ratio will decline	Since the cash being a current asset converted into fixed asset, current assets reduced, thus current ratio will fall.

(iii)	Cash collected from Customers	Current Ratio will not change	Cash will increase and Debtors will reduce. Hence No Change in Current Asset.
(iv)	Bills Receivable Dishonoured	Current Ratio will not change	Bills Receivable will come down and debtors will increase. Hence no change in Current Assets
(v)	Issue of New Shares	Current Ratio will improve	As Cash will increase, Current Assets will increase and current ratio will increase.

QUESTION 22 : PAPER – MAY 2024

Theme Ltd provides you the following information :

12.5% Debt	Rs.45,00,000
Debt to Equity ratio	1.5 : 1
Return on Shareholder's fund	54%
Operating Ratio	85%
Ratio of operating expenses to Cost of Goods sold	2 : 6
Tax rate	25%
Fixed Assets	Rs.39,00,000
Current Ratio	1.8 : 1

You are required to calculate :

(i) Interest Coverage Ratio

(ii) Gross Profit Ratio

(iii) Current Assets

Thanks ….

CHAPTER

4 FINANCING DECISIONS - LEVERAGES

QUESTION 1 : MTP – OCT 2018

NSG Ltd. has a sale of Rs.75,00,000, variable cost of Rs.42,00,000 and fixed cost of Rs.6,00,000. The Present capital structure of NSG is as follows:

Equity Shares	Rs. 55,00,000
Debt (12%)	Rs. 45,00,000
Total	Rs. 1,00,00,000

(i) DETERMINE the ROCE of NSG Ltd.
(ii) Does NSG have a favourable financial leverage? ANALYSE.
(iii) If the industry average of asset turnover is 3, does it have a high or low asset leverage?
(iv) COMPUTE the leverages of NSG?
(v) DETERMINE, at what level of sales, will the EBT be zero?

SOLUTION :

1) ROCE = $\frac{EBIT}{Capital\ Employed}$ = $\frac{27,00,000}{1,00,00,000}$ x 100 = 27%

Calculation of EBT: Rs.

Sales	75,00,000
Less: Variable costs	42,00,000
Contribution	33,00,000
Less: Fixed costs	6,00,000
EBIT	27,00,000
Less: Interest (12 % of Rs. 45,00,000)	5,40,000
EBT	21,60,000

Capital employed = Debt + Equity Shares = Rs. 1,00,00,000.
Since ROCE (27%) is higher than the interest payable on debt (12%). NSG has a favourable financial leverage.
Capital employed = Total assets = Rs. 1,00,00,000 Net sales = Rs.75,00,000

Therefore, turnover ratio= $\frac{Rs\ 75,00,000}{Rs\ 1,00,00,000}$ = 0.7

The industry average is 3 against NSG9s ratio of 0.75. Hence NSG Ltd. has very low asset leverage.

Operating leverage = $\frac{Contribution}{EBIT}$ = $\frac{Rs\ 33,0,000}{Rs\ 27,00,000}$ = 1.22

Financial Leverage = $\frac{EBIT}{EBT}$ = $\frac{Rs\ 27,00,000}{Rs\ 21,60,000}$ = 1.25

Combined leverage = $\frac{Contribution}{EBT}$ = $\frac{Rs\ 33,00,000}{Rs\ 21,60,000}$ = 1.53

OR

DCL = DOL × DFL= 1.22 × 1.25 = 1.53

For EBT to become zero, a 100% reduction in the EBT is required. As the combined leverage is 1.53, sales have to drop approx. by 100/1.53 = 65.36%. Hence, the new sales will be: Rs. 75,00,000 × (1 3 0.6536) = Rs. 25,98,000 (approx.)

QUESTION 2 : RTP – MAY 2019

A company had the following balance sheet as on 31st March, 2021:

Liabilities	Rs in Crores	Assets	Rs. In Crores
Equity Share Capital (75 lakhs Shares of Rs.10 each	7.50	Building	12.50
Reserves and Surplus	1.50	Machinery	6.25
15% Debentures	15.00	Current Assets	
Current Liabilities	6.00	Stock	3.00
		Debtors	3.25
		Bank Balance	5.00
	30.00		30.00

The additional information given is as under :

Fixed cost per annum (excluding interest)	Rs.6 crores
Variable operating cost ratio	60%
Total assets turnover ratio	2.5
Income-tax rate	40%

Calculate the following and comment:

(i) Earnings per share (ii) Operating Leverage

(iii) Financial Leverage (iv) Combined Leverage

SOLUTION :

Total Assets = 30 crores

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = 30 ×2.5 = Rs.75 crores

Computation of Profit after Tax (PAT)

Particulars	(Rs.in crores)
Sales	75.00
Less: Variable Operating Cost @60%	45.00
Contribution	30.00
Less: Fixed Cost (other than Interest)	6.00

EBIT/PBIT	24.00
Less: Interest on Debentures (15% X 15)	2.25
EBT/PBT	21.75
Less: Tax @ 40%	8.70
EAT/ PAT	13.05

(i) Earnings per Share

EPS = $\frac{\text{PAT}}{\text{Number of Equity Shares}} = \frac{13.05}{0.75}$ = Rs.17.40

Number of Equity Shares

It indicates the amount the company earns per share. Investors use this as a guide while valuing the share and making investment decisions. It is also an indicator used in comparing firms within an industry or industry segment.

(ii) Operating Leverage

Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{30}{24}$ = 1.25

It indicates the choice of technology and fixed cost in cost structure. It is level specific. When firm operates beyond operating break-even level, then operating leverage is low. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

Financial Leverage = $\frac{\text{EBIT}}{\text{PBT}} = \frac{24}{21.75}$ = 1.103

The financial leverage is very comfortable since the debt service obligation is small vis -à-vis EBIT.

(iv) Combined Leverage

Combined Leverage= $\frac{Contribution}{PBT} = \frac{30}{21.75}$ = 1.379

Or,

= Operating Leverage × Financial Leverage

= 1.25 × 1.103 = 1.379

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales. The leverages operating, financial and combined are used as measurement of risk.

QUESTION 3 : MAY 2019

The capital structure of the Shiva Ltd. consists of equity share capital of Rs. 20,00,000 (share of Rs. 100 per value) and Rs. 20,00,000 of 10% Debentures, sales increased by 20% from 2,00,000 units to 2,40,000 units, the selling price is Rs. 10 per unit; variable costs amount to Rs. 6 per unit and fixed expenses amount to Rs. 4,00,000. The income tax rate is assumed to be 50%

a. You are required to calculate the following :

(i) The percentage increase in earnings per share;

(ii) Financial leverage at 2,00,000 units and 2,40,000 units.

(iii) Operating leverage at 2,00,000 units and 2,40,000 units

b. Comment on the behavior of operating and Financial leverage in relation to increase in production from 2,00,000 units to 2,40,000 units

SOLUTION :

(a)

Sales in Units	**2,00,000 (Rs)**	**2,40,000 (Rs)**
Sales Value @ Rs. 10 Per Unit	20,00,000	24,00,000
Variable Cost @ Rs. 6 Per Unit	(12,00,000)	(14,40,000)
Contribution	8,00,000	9,60,000
Fixed Expenses	(4,00,000)	(4,00,000)
EBIT	4,00,000	5,60,000
Debenture Interest	(2,00,000)	(2,00,000)
EBT	2,00,000	3,60,000
Tax@50%	(1,00,000)	(1,80,000)
Profit after tax (PAT)	1,00,000	1,80,000
No of Shares	20,000	20,000
Earnings per Share (EPS)	5	9
(i) The percentage Increase in EPS	$\frac{4}{5}$ x100=80%	
(ii) **Financial Leverage =** $\frac{EBIT}{EBT}$	$\frac{Rs.4,00,000}{Rs.2,00,000}=2$	$\frac{Rs.5,60,000}{Rs.3,60,000}=1.56$
(iii) **Operating leverage =** $\frac{Contribution}{EBIT}$	$\frac{Rs.8,00,000}{Rs.4,00,000}=2$	$\frac{Rs.9,60,000}{Rs.5,60,000}=1.71$

(b) When production is increased from 2,00,000 units to 2,40,000 units both financial leverage and operating leverages reduced from 2 to 1.56 and 1.71 respectively. Reduction in financial leverage and operating leverages signifies reduction in business risk and financial risk.

QUESTION 4 : NOV 2019

The Balance Sheet of Gitashree Ltd is given below

Liabilities		Rs.
Shareholder's fund		
Equity share capital of Rs. 10 each	Rs. 1,80,000	
Retained Earnings	Rs. 60,000	
		2,40,000
Non-current liabilities 10% debt		2,40,000
Current liabilities		1,20,000
		6,00,000

Assets	
Fixed Assets	4,50,000
Current Assets	1,50,000
	6,00,000

The company's total asset turnover ratio is 4. Its fixed operating cost is Rs. 2,00,000 and its variable operating cost ratio is 60%. The income tax rate is 30%

Calculate :

(i) (a) Degree of Operating leverage

(b) Degree of Financial leverage

(c) Degree of Combined leverage

(ii) Find out EBIT if EPS is (a) Rs. 1 (b) Rs. 2 and (c) Rs. 0.

SOLUTION :

Working Notes:

Total Assets = Rs. 6,00,000

Total Asset Turnover Ratio I.e. $= \frac{Total\ \text{Sales}}{Total\ \text{Assets}} = 4$

Hence, Total Sales = Rs. 6,00,000 x 4 = Rs. 24,00,000

Computation of Profit after Tax (PAT)

Particulars	**Rs.**
Sales	24,00,000
Less: Variable operating cost @ 60%	14,40,000
Contribution	9,60,000
Less : Fixed operating cost (other than Interest)	2,00,000
EBIT (Earnings before interest and tax)	7,60,000
Less : Interest on debt (10% x 2,40,000)	24,000
EBT (Earnings before tax)	7,36,000
Less : Tax 30%	2,20,800
EAT (Earnings after tax)	5,15,200

(i) (a) **Degree of Operating Leverage**

Degree of Operating Leverage = $\frac{Contribution}{EBIT} = \frac{Rs.9,60,000}{Rs.7,60,000} = 1.263$ (approx)

(b) **Degree of Financial Leverage**

Degree of Operating Leverage = $\frac{EBIT}{EBT} = \frac{Rs.9,60,000}{Rs.7,60,000} = 1.033$ (approx)

(c) **Degree of Combined Leverage**

Degree of Combined Leverage = $\frac{Contribution}{EBIT} = \frac{EBIT}{EBT} = \frac{Contribution}{EBT}$

$$= \frac{Rs.9,60,000}{Rs.7,60,000} = 1.304 \text{ (approx)}$$

Degree of Combined Leverage = Degree Of Operating Leverage x Degree of Financial Leverage

= 1.263 x 1.033 = 1.304 (approx.)

(ii) (a) **If EPS is Re. 1**

$$EPS = \frac{(EBIT \text{ - Interest}) \text{ (1-tax)}}{No. \text{ of equity shares}}$$

$$\text{Or, } 1 = \frac{(EBIT \text{ - Rs. } 24{,}000) \text{ (1- } 0.30)}{18{,}000}$$

Or, EBIT = Rs. 49,714 (approx.)

(b) If EPS is Rs. 2

$$2 = \frac{(EBIT \text{ - Rs. } 24{,}000) \text{ (1- } 0.30)}{18{,}000}$$

Or, EBIT = Rs. 75,429 (approx.)

(c) IF EPS is Rs. 0

$$0 = \frac{(EBIT \text{ - Rs. } 24{,}000) \text{ (1- } 0.30)}{18{,}000}$$

Or, EBIT = Rs. 24,000

Alternatively, IF EPS is 0 (zero), EBIT will be equal to interest on debt i.e. Rs. 24,000.

QUESTION 5 : NOV 2020

The following data is available for Stone Ltd :

	Rs.
Sales	5,00,000
(-) Variable cost @ 40%	2,00,000
Contribution	3,00,000
(-) Fixed cost	2,00,000
EBIT	1,00,000
(-) Interest	25,000
Profit before tax	75,000

Using the concept of leverage, find out

i. The percentage change in taxable income if EBIT increases by 10%

ii. The percentage change in EBIT if sales increases by 10%

iii. The percentage change in taxable income if sales increases by 10%.

Also verify the results in each of the above case.

SOLUTION :

(i) Degree of Financial Leverage = $\frac{EBIT}{EBT} = \frac{Rs.\ 1,00,000}{Rs.\ 75,000} = 1.333$ times

So, If EBIT increases by 10% then Taxable Income (EBT) will be increased by 1.333 x 10 = 13.33% (approx.)

Verification

Particulars	Amount (Rs)
New EBIT after 10% increase (Rs. 1,00,000 + 10%)	1,10,000
Less : Interest	25,000
Earnings before Tax after change (EBT)	85,000

Increase in Earnings before Tax = Rs. 85,000 – Rs. 75,000 = Rs. 10,000

So, percentage change in Taxable Income (EBT) = $\frac{Rs.\ 10,000}{Rs.\ 75,000}$ x 100 = 13.333%, hence verified

(ii) Degree of Operating Leverage = $\frac{Contribution}{EBIT} = \frac{Rs.\ 3,00,000}{Rs.\ 1,00,000} = 3$ times

So, if sale is increased by 10% then EBIT will be increased by 3 x 10 = 30%

Verification

Particulars	Amount (Rs)
New Sales after 10% increase (Rs. 5,00,000 + 10%)	5,50,000
Less : Variable cost (40% of Rs. 5,50,000)	2,20,000
Contribution	3,30,000
Less : Fixed costs	2,00,000
Earnings before interest and tax after change (EBIT)	1,30,000

Increase in Earnings before interest and tax (EBIT) = Rs. 1,30,000 – Rs. 1,00,000 = Rs. 30,000

So, percentage change in EBIT = $\frac{Rs.\ 30,000}{Rs.\ 1,00,000}$ x 100 = 30%, hence verified.

(iii) Degree in Combined Leverage = $\frac{Contribution}{EBIT} = \frac{Rs.\ 3,00,000}{Rs.\ 75,000} = 4$ times

So, if sale is increased by 10% then Taxable Income (EBT) will be increased by 4 x 10 = 40%

Verification

Particulars	Amount (Rs)
New Sales after 10% increase (Rs. 5,00,000 + 10%)	5,50,000
Less : Variable cost (40% of Rs. 5,50,000)	2,20,000
Contribution	3,30,000
Less : Fixed costs	2,00,000
Earnings before interest and tax (EBIT)	1,30,000
Less : Interest	25,000

Earnings before tax after change (EBT)	1,05,000

Increase in Earnings before tax (EBT) = Rs. 1,05,000 – Rs. 75,000 = Rs. 30,000

So, percentage change in Taxable Income (EBT) = $\frac{Rs.\ 30{,}000}{Rs.\ 75{,}000}$ x 100 = 40%, hence verified

QUESTION 6 : APR 2021

Following data of MT Ltd. under Situations 1, 2 and 3 and Financial Plan A and B is given:

Installed Capacity (units)	3,600
Actual Production and Sales (units)	2,400
Selling price per unit (Rs.)	30
Variable cost per unit (Rs.)	20
Fixed Costs (Rs.): Situation 1	3,000
Situation 2	6,000
Situation 3	9,000

Capital Structure :

Particulars	Financial Plan	
	A	B
Equity Debt	Rs. 15,000	Rs. 22,500
Cost of Debt	Rs. 15,000	Rs. 7,500
	12%	12%

Required:

(i) CALCULATE the operating leverage and financial leverage.

(ii) FIND out the combinations of operating and financial leverage which give the highest value and the least value.

SOLUTION :

(i) Operating Leverage

	Situation 1 (Rs.)	Situation 2 (Rs.)	Situation 3 (Rs.)
Sales (S)			
2,400 units @ Rs. 30 per unit	72,000	72,000	72,000
Less: Variable Cost (VC) @ Rs. 20 per unit	48,000	48,000	48,000
Contribution (C)	24,000	24,000	24,000
Less: Fixed Cost (FC)	3000	6000	9000
EBIT	21,000	18,000	15,000
Operating Leverage = $\frac{C}{EBIT}$	$\frac{Rs\ 24{,}000}{Rs\ 21{,}000} = 1.14$	$\frac{Rs\ 24{,}000}{Rs\ 18{,}000}$ = 1.33	$\frac{Rs\ 24{,}000}{Rs\ 15{,}000}$ = 1.60

Financial Leverage

	Financial Plan	
	A(Rs)	**B(Rs)**
Situation 1		
EBIT	21,000	21,000
Less: Interest on debt (Rs. 15,000 x 12%);(Rs. 7,500 x 12%)	1,800	900
EBT	19,200	20,100
Financial Leverage = EBIT /EBT	$\frac{Rs\ 21,000}{Rs\ 19,200} = 1.09$	$\frac{Rs\ 21,000}{Rs\ 20,100} = 1.04$
Situation 2		
EBIT	18,000	18,000
Less: Interest on debt	1,800	900
EBT	16,200	17,100
Financial Leverage = EBIT /EBT	$\frac{Rs\ 18,000}{Rs16200} = 1.11$	$\frac{Rs\ 18,000}{Rs\ 17,000} = 1.05$
Situation 3		
EBIT	15,000	15,000
Less: Interest on debt	1,800	900
EBT	13,200	14,100
Financial Leverage = $\frac{EBIT}{EBT}$	$\frac{Rs\ 15,000}{Rs\ 13,200} = 1.14$	$\frac{Rs\ 15,000}{Rs\ 14,100} = 1.06$

Combined Leverages

CL = OL x FL

	Financial Plan	
	A(Rs)	B(Rs)
(a) Situation 1	1.14 x 1.09 = 1.24	1.14 x 1.04 = 1.19
(b) Situation 2	1.33 x 1.11 = 1.48	1.33 x 1.05 = 1.40
(c) Situation 3	1.60 x 1.14 = 1.82	1.60 x 1.06 = 1.70

The above calculations suggest that the highest value is in Situation 3 financed by Financial Plan A and the lowest value is in the Situation 1 financed by Financial l Plan B.

QUESTION 7 : JAN 2021

The information related to XYZ Company Ltd for the year ended 31st March 2020 are as follows :

Equity Share Capital of Rs. 100 each	Rs. 50 Lakhs
12% Bonds of Rs. 1000 each	Rs. 30 Lakhs
Sales	Rs. 84 Lakhs
Fixed Cost (Excluding Interest)	Rs. 7.5 Lakhs

Financial Leverage	1.39
Profit – Volume Ratio	25%
Market Price Per Equity Share	Rs. 200
Income Tax Rate Applicable	30%

You are required to Compute the following

i. Operating Leverage
ii. Combined Leverage
iii. Earnings per share
iv. Earnings Yield

SOLUTION :

Workings:

1. Profit Volume Ratio $= \frac{Contribution}{Sales} \times 100$

So, $25 = \frac{Contribution}{Rs.\ 84,00,000} \times 100$

Contribution $= \frac{Rs.\ 84,00,000 \times 25}{100} \times Rs.\ 21,00,000$

2. Financial leverage $= \frac{EBIT}{EBT}$

Or, 1.39 $= \frac{Rs.\ 13,50,000 \text{ (as calculated above)}}{EBT}$

EBT = Rs. 9,71,223

3. Income Statement

Particulars	**Rs.**
Sales	84,00,000
Less : Variable Cost (Sales – Contribution)	(63,00,000)
Contribution	21,00,000
Less : Fixed Cost	(7,50,000)
EBIT	13,50,000
Less : Interest (EBIT – EBT)	3,78,777
EBT	9,71,223
Less : Tax @ 30%	(2,91,367)
Profit after Tax (PAT)	6,79,856

i. **Operating Leverage** $= \frac{Contribution}{Earnings \text{ before interest and tax (EBIT)}}$

$= \frac{Rs.\ 21,00,000}{Rs.\ 13,50,000} = 1.556 \text{ (approx.)}$

ii. **Combined Leverage =** Operating Leverage x Financial Leverage

= 1.556 x 1.39 = 2.163 (approx.)

Or, $\frac{Contribution}{EBT}$ = $\frac{Rs.\ 21,00,000}{Rs.\ 9,71,223}$ = 2.162 (approx.)

iii. **Earnings per Share (EPS)**

$$EPS = \frac{PAT}{No.\ of\ Shares} = \frac{Rs.\ 6,79,856}{50,000} = Rs.\ 13.597$$

iv. **Earning Yield**

$$= \frac{EPS}{Market\ Price} \times 100 = \frac{Rs.\ 13.597}{Rs.\ 200} \times 100 = 6.80\%\ (approx.)$$

Note : The question has been solved considering Financial Leverage given in the question as the base for calculating total interest expense including the interest of 12% Bonds of Rs. 30 Lakhs. The Question can also be solved in other alternative ways.

QUESTION 8 : MAY 2021

Following information has been extracted from the accounts of newly incorporated Textyl Pvt. Ltd. for the Financial Year 2020-21:

Sales	15,00,000
P/V ratio	70%
Operating Leverage	1.4 times
Financial Leverage	1.25 times

Using the concept of leverage, find out and verify in each case:

(i) The percentage change in taxable income if sales increase by 15%.

(ii) The percentage change in EBIT if sales decrease by 10%.

(iii) The percentage change in taxable income if EBIT increase by 15%.

SOLUTION :

Workings:

1. Contribution = Sales x P/V ratio

   = ¹ 15,00,000 x 70% = ¹ 10,50,000

2. Operating Leverage = $\frac{Contribution}{Earnings\ before\ interest\ and\ Tax\ (EBI)}$

   Or, 1.4 = $\frac{Rs\ 10,50,000}{EBIT}$

   EBIT = Rs. 7,50,000

3. Financial Leverage = $\frac{EBIT}{EBT}$

   Or, 1.25 = $\frac{Rs\ 7,50,000}{EBT}$

   EBT = Rs. 6,00,000

4. Fixed Cost = Contribution 3 EBIT

   = ¹ 10,50,000 3 ¹ 7,50,000 = ¹ 3,00,000

5. Interest = EBIT 3 EBT

= ₹ 7,50,000 3 ₹ 6,00,000 = ₹ 1,50,000

6. Income Statement

Particulars	Amount (Rs)
Sales	15,00,000
Less: Variable cost (30% of ₹ 15,00,000)	4,50,000
Contribution (70% of ₹ 15,00,000)	10,50,000
Less: Fixed costs	3,00,000
Earnings before interest and tax (EBIT)	7,50,000
Less: Interest	1,50,000
Earnings before tax (EBT)	6,00,000

(i) Combined Leverage = $\frac{Contribution}{EBT} = \frac{Rs\ 10{,}50{,}000}{Rs\ 6{,}00{,}000} = 1.75\ times$

Or, Combined Leverage = Operating Leverage x Financial Leverage

= 1.4 x 1.25 = **1.75 times**

So, if sales is increased by 15% then taxable income (EBT) will be increased by 1.75 × 15% = 26.25%

Verification

Particulars	**Amount**
New Sales after 15% increase (₹ 15,00,000 + 15% of ₹ 15,00,000)	17,25,000
Less: Variable cost (30% of ₹ 17,25,000)	5,17,500
Contribution (70% of ₹ 17,25,000)	12,07,500
Less: Fixed costs	3,00,000
Earnings before interest and tax (EBIT)	9,07,500
Less: Interest	1,50,000
Earnings before tax after change (EBT)	7,57,500

Increase in Earnings before tax (EBT) = ₹ 7,57,500 - ₹ 6,00,000 = ₹ 1,57,500

So, percentage change in Taxable Income (EBT) = $\frac{Rs1{,}57{,}500}{Rs\ 6{,}00{,}000} \times 100 = 26.25\%$, hence verified

(ii) Degree of Operating Leverage (Given) = **1.4 times**

So, if sales is decreased by 10% then EBIT will be decreased by 1.4 × 10% = **14%**

Verification

Particulars	**Amount**
New Sales after 10% decrease (Rs15,00,000 - 10% of Rs 15,00,000)	13,50,000
Less: Variable cost (30% of Rs 13,50,000)	4,05,000
Contribution (70% of ₹ 13,50,000)	9,45,000
Less: Fixed costs	3,00,000
Earnings before interest and tax after change (EBIT)	6,45,000

Decrease in Earnings before interest and tax (EBIT) = Rs 7,50,000 - Rs 6,45,000 = Rs 1,05,000

So, percentage change in EBIT = $\frac{Rs\ 1{,}05{,}000}{Rs\ 7{,}50{,}000} \times 100 = 14\%, hence\ verified.$

(iii) Degree of Financial Leverage (Given) = 1.25 times

So, if EBIT increases by 15% then Taxable Income (EBT) will be increased by 1.25 × 15% = 18.75%

Verification

Particulars	Amount (Rs)
New EBIT after 15% increase (₹ 7,50,000 + 15% of ₹ 7,50,000)	8,62,500
Less: Interest	1,50,000
Earnings before Tax after change (EBT)	7,12,500

Increase in Earnings before tax = ₹ 7,12,500 - ₹ 6,00,000 = ₹ 1,12,500

So, percentage change in Taxable Income (EBT) $= \frac{Rs\ 1,12,500}{Rs\ 6,00,000} \times 100 = 18.75\%$, $hence\ verified$.

QUESTION 9 : JULY 2021

A company had the following balance sheet as on 31st March 2021 :

Liabilities	Rs. In crore	Assets	Rs. In crore
Equity Share Capital (75 Lakhs Shares of Rs. 10 each)	7.50	Building	12.50
Reserves and Surplus	1.50	Machinery	6.25
15% Debentures	15.00	Current Assets	
Current Liabilities	6.00	Stock	3.00
		Debtors	3.25
		Bank Balance	5.00
	30.00		30.00

The additional information given is as under :

Fixed cost per annum (excluding interest)	Rs. 6 crores
Variable operating cost ratio	60%
Total assets turnover ratio	2.5
Income tax rate	40%

Calculate the following and comment :

(i) Earnings per share
(ii) Operating Leverage
(iii) Financial Leverage
(iv) Combined Leverage

SOLUTION :

Total Assets	=	Rs. 30 Crores
Total Assets Turnover Ratio	=	2.5
Hence, Total Sales	=	30 x 2.5 = Rs. 75 Crores

Computation of Profit after Tax (PAT)

Particulars	(Rs in crores)

Sales	75.00
Less : Variable Operating cost @ 60%	45.00
Contribution	30.00
Less : Fixed Cost (other than Interest)	6.00
EBIT / PBIT	24.00
Less : Interest on Debentures (15% x 15)	2.25
EBT / PBT	21.75
Less : Tax @ 40%	8.70
EAT / PAT	13.05

(i) Earnings per Share

$$EPS = \frac{PAT}{\text{Number of Equity Shares}} = \frac{13.05}{0.75} = \text{Rs. } 17.40$$

It indicates the amount the company earns per share. Investors use this as a guide while valuing the share and making investment decisions. It is also indicator used in comparing firms within an industry or industry segment.

(ii) Operating Leverage

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{30}{24} = 1.25$$

It indicates the choice of technology and fixed cost in cost structure. It is level specific. When firm operates beyond operating break-even level, then operating leverage is low. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\textit{Financial}\ \text{Leverage} = \frac{EBIT}{PBT} = \frac{24}{21.75} = 1.103$$

The financial leverage is very comfortable since the debt service obligation is small viz-a-viz EBIT.

(iv) Combined Leverage

$$\textit{Combined}\ \text{Leverage} = \frac{Contribution}{PBT} = \frac{30}{21.75} = 1.379$$

Or,

= Operating Leverage x Financial Leverage

= 1.25 x 1.103 = 1.379

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is viz-a-viz change in sales. The leverage operating, financial and combined are used as measurement of risk.

QUESTION 10 : DEC 2021

Information of A Ltd is given below :

- Earnings after tax : 5% on sales
- Income tax rate : 50%
- Degree of operating Leverage : 4 times
- 10% Debenture in capital structure : Rs. 3 Lakhs

- Variable costs : Rs. 6 Lakhs

Required

(i) From the given data complete following statement :

Sales	XXXXX
Less : Variable Costs	Rs. 6,00,000
Contribution	XXXXX
Less : Fixed costs	XXXXX
EBIT	XXXXX
Less : Interest expenses	XXXXX
EBT	XXXXX
Less : Income Tax	XXXXX
EAT	XXXXX

(ii) Calculate Financial Leverage and Combined Leverage

(iii) Calculate the percentage change in earnings per share, if sales increased by 5%.

SOLUTION :

i. Working Notes

Earning after tax (EAT)is 5% of sales

Income tax is 50%

Since Interest Expenses is Rs. 30,000

EBIT = 10% of Sales + Rs. 30,000 ..... (Equation i)

Now Degree of operating leverage = 4

So, $\frac{Contribution}{EBIT} = 4$

Or, Contribution = 4 EBIT

Or, Sales – Variable Cost = 4 EBIT

Or, Sales – ` 6,00,000 = 4 EBIT ..... (Equation ii)

Replacing the value of EBIT of equation (i) in Equation (ii)

We get, Sales – Rs. 6,00,000 = 4 (10% of Sales + Rs. 30,000)

Or, Sales – Rs. 6,00,000 = 40% of Sales + Rs. 1,20,000

Or, 60% of Sales = Rs. 7,20,000

So, $Sales = \frac{Rs.7,20,000}{60\%} = \text{Rs. } 12,00,000$

Contribution = Sales – Variable Cost = Rs. 12,00,000 – Rs. 6,00,000 =Rs. 6,00,000

$EBIT = \frac{Rs.6,00,000}{4} = \text{Rs. } 1,50,000$

Fixed Cost = Contribution – EBIT = Rs. 6,00,000 – Rs. 1,50,000 = Rs. 4,50,000

EBT = EBIT – Interest = Rs. 1,50,000 – Rs. 30,000 = Rs. 1,20,000

EAT = 50% of Rs. 1,20,000 = Rs. 60,000

Income Statement

Particulars	**Rs.**
Sales	**12,00,000**
Less: Variable cost	6,00,000

Contribution	6,00,000
Less : Fixed Cost	4,50,000
EBIT	**1,50,000**
Less: Interest	30,000
EBT	**1,20,000**
Less: Tax (50%)	60,000
EAT	60,000

ii. $$Financial\ \text{Leverage} = \frac{EBIT}{EBT} = \frac{1,50,000}{1,20,000} = 1.25\ \text{times}$$

Combined Leverage = Operating Leverage × Financial Leverage

= 4 x 1.25 = **5 times**

OR,

$$Combined\ \text{Leverage} = \frac{Contribution}{EBIT} \times \frac{EBIT}{EBT}$$

$$Combined\ \text{Leverage} = \frac{Contribution}{EBIT} = \frac{Rs.6,00,000}{Rs.1,20,000} = 5\ \text{times}$$

iii. Percentage Change in Earnings per share

$$Combined\ \text{Leverage} = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in Sales}} = 5 = \frac{\%\ \text{change in EPS}}{5\%}$$

∴ % Change in EPS = 25%

Hence, if sales increased by 5 %, EPS will be increased by 25 %.

QUESTION 11 : PAPER – MAY 2022

Details of a company for the year ended 31st March 2022 are given below:

Sales	Rs. 86 Lakhs
Profit Volume (P/V) Ratio	35%
Fixed Cost excluding interest expenses	Rs. 10 Lakhs
10% Debt	Rs. 55 Lakhs
Equity Share Capital of Rs. 10 each	Rs. 75 Lakhs
Income Tax Rate	40%

Required:

i. Determine company's Return on Capital Employed (Pre-tax) and EPS

ii. Does the company have a favorable financial leverage?

iii. Calculate operating and combined leverage of the company

iv. Calculate percentage change in EBIT, if sales increases by 10%

v. At what level of sales, the Earnings before Tax (EBT) of the company will be equal to zero?

SOLUTION :

Income Statement

Particulars	Amount (Rs)
Sales	86,00,000
Less: Variable cost (65% of 86,00,000)	55,90,000
Contribution (35% of 86,00,000)	30,10,000
Less: Fixed costs	10,00,000
Earnings before interest and tax (EBIT)	20,10,000
Less: Interest on debt (@ 10% on Rs. 55 lakhs)	5,50,000
Earnings before tax (EBT)	14,60,000
Tax (40%)	5,84,000
PAT	8,76,000

(i) ROCE (Pre-tax) $= \frac{EBIT}{Capital\ employed} \times 100 = \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{Rs.\ 20,10,000}{Rs.\ (75,00,00 + 55,00,000)} \times 100 = 15.46\%$

EPS (PAT/No. of equity shares) **1.168 or Rs. 1.17**

(ii) ROCE is 15.46% and Interest on debt is 10%. Hence, it has a favorable financial leverage.

(iii) Calculation of Operating, Financial and Combined leverages:

$Operating\ \text{Leverage}\ \frac{Contribution}{EBIT} = \frac{Rs.30,10,000}{Rs.20,10,000} = 1.497\ (approx)$

$\text{Financial Leverage}\ \frac{EBIT}{EBIT} = \frac{Rs.20,10,000}{Rs.14,60,000} = 1.377\ (approx)$

$\text{Combined Leverage}\ \frac{Contribution}{EBT} = \frac{Rs.30,10,000}{Rs.14,60,000} = 2.062\ (approx)$

Or, = Operating Leverage × Financial Leverage = 1.497 × 1.377 = 2.06 (approx.)

(iv) Operating leverage is 1.497. So, if sales are increased by 10%.
EBIT will be increased by 1.497 × 10% i.e. 14.97% (approx.)

(v) Since the combined Leverage is 2.062, sales have to drop by 100/2.062 i.e. 48.50% to bring EBT to Zero.

Accordingly, New Sales = Rs. 86,00,000 × (1 - 0.4850)
= Rs. 86,00,000 × 0.515
= Rs. 44,29,000 (approx.)

Hence, at Rs. 44,29,000 sales level, EBT of the firm will be equal to Zero

QUESTION 12 : PAPER – NOV 2022

The following information is available for SS Ltd

Profit volume (PV) ratio	-	30%
Operating leverage	-	2.00
Financial leverage	-	1.50
Loan	-	Rs. 1,25,000
Post-tax interest rate	-	5.6%
Tax rate	-	30%
Market Price per share (MPS)	-	Rs. 140
Price Earnings Ratio (PER)	-	10

You are required to

1. Prepare the Profit-Loss statement of SS Ltd and
2. Find out the number of equity shares.

SOLUTION :

1. Preparation of Profit – Loss Statement

Working Notes:

1. Post tax interest 5.60%
   Tax rate 30%
   Pretax interest rate = (5.6/70) x 100 8%
   Loan amount Rs. 1,25,000
   Interest amount = 1,25,000 x 8% Rs. 10,000

$$Financial\ \text{Leverage (FL)} = \left(\frac{EBIT}{EBT}\right) = \left[\frac{EBIT}{(EBIT\ \text{- Interest})}\right] = \left[\frac{EBIT}{(EBIT\ \text{- 10,000})}\right]$$

$$1.5 = \left[\frac{EBIT}{(EBIT\ \text{- 10,000})}\right]$$

1.5 EBIT -15000 = EBIT
1.5 EBIT – EBIT = 15,000
0.5 EBIT = 15,000
∴ EBIT = Rs. 30,000
EBT = EBIT – Interest = 30,000 – 10,000 = Rs. 20,000

2. Operating Leverage (OL) $= \frac{Contribution}{EBIT}$

   2 $= \frac{Contribution}{30,000}$

   Contribution = Rs. 60,000

3. **Fixed cost** = Contribution – Profit
   = 60,000 – 30,000 = Rs. 30,000

4. Sales $= \frac{Contribution}{PV\ Ratio}$

$= \frac{60,000}{30\%}$ Rs. 2,00,000

5. If PV ratio is 30%, then the variable cost is 70% on sales

∴Variable cost = 2,00,000 x 70% = Rs. 1,40,000

Profit – Loss Statement

Particulars	**Rs**
Sales	2,00,000
Less: Variable cost	1,40,000
Contribution	60,000
Less: Fixed cost	30,000
EBIT	30,000
Less: Interest	10,000
EBT	20,000
Less: Tax @ 30%	6,000
EAT	14,000

2. Calculation of no. of Equity shares

Market Price per Share (MPS) = Rs. 140

Price Earnings Ratio (PER) = 10

WKT,

$EPS = \frac{MPS}{PER} = \frac{140}{10} = Rs.\ 14$

Total earnings (EAT) = Rs. 14,000

∴ No. of Equity Shares = 14,000 / 14 = 1000

QUESTION 13 : PAPER – MAY 2023

Following information is given for X Ltd

Total contribution (Rs)	4,25,000
Operating Leverage	3.125
15% Preference Shares (Rs. 100 each)	1,000
Number of Equity Shares	2,500
Tax Rate	50%

Calculate EPS of X Ltd, if 40% decrease in sales will result EPS to zero.

SOLUTION :

(All figures are in Rs.)

(i) Operating Leverage (OL) = $\frac{\text{Contribution}}{\text{EBIT}}$ or, $3.125 = \frac{\text{Rs. 4,25,000}}{\text{EBIT}}$ or EBIT

= Rs. 1,36,000

(ii) Degree of Combined Leverage (CL) = $\frac{\%\ \text{Change in EPS}}{\%\ \text{Change in Sales}} = \frac{100}{40} = 2.5$

(iii) Combined Leverage = OL × FL = 3.125 × FL

So, Financial Leverage = 2.5 /3.125 = 0.8

(iv) Financial Leverage = $\frac{EBIT}{EBT} = \frac{1,36,000}{EBT} = 0.8$

$So,\ \text{EBT} = \frac{1,36,000}{0.80} = \text{Rs. } 1,70,000$

Calculation of EPS of X Ltd

Particulars	**Rs.**
EBT	1,70,000
Less: Tax (50%)	85,000
EAT	85,000
Preference Dividend	15,000
Net Earnings for Equity Shareholders	70,000
Number of equity shares	2,500
EPS	**28**

QUESTION 14 : RTP – MAY 2023

The selected financial data for A, B and C companies for the current year ended 31st March are as follows:

Particulars	A	B	C
Variable Expenses as a % of sales	60	50	40
Interest	Rs 1,00,000	Rs 4,00,000	Rs 6,00,000
Degree of Operating Leverage	4:1	3:1	2:5:1
Degree of Financial Leverage	3:1	5:1	2:5:1
Income Tax Rate	30%	30%	30%

(a) PREPARE income statement for A, B and C companies

(b) COMMENT on the financial position and structure of these companies .

SOLUTION :

Income Statement of companies A, B and C

Particulars	**A (Rs)**	**B(Rs)**	**C(Rs)**
Sales	15,00,000	30,00,000	41,66,667
Less: Variable Expenses	9,00,000	15,00,000	16,66,667
Contribution	6,00,000	15,00,000	25,00,000
Less: Fixed Cost	4,50,000	10,00,000	15,00,000
EBIT	1,50,000	5,00,000	10,00,000
Less: Interest	1,00,000	4,00,000	6,00,000
PBT	50,000	1,00,000	4,00,000
Less: Tax @ 30%	15,000	30,000	1,20,000
PAT	35,000	70,000	2,80,000

Working Notes:

(i) Degree of Financial Leverage = $\frac{EBIT}{EBI-INTEREST}$

DFL x (EBIT - Int) = EBIT

DFL x EBIT - Int x DFL= EBIT

DFL x EBIT - EBIT =Int x DFL

EBIT(DFL - 1) = Int x DFL

EBIT = $\frac{int \times DFL}{DFL-1}$

For A,

EBITA = $\frac{Rs\ 1{,}00{,}000 \times 3}{3-1}$

EBITA = Rs. 150000

For B,

EBIT B = $\frac{Rs\ 4{,}00{,}000 \times 5}{5-1}$

EBITB= Rs. 500000

For c,

EBIT B = $\frac{Rs\ 6{,}00{,}000 \times 2.5}{2.5-1}$

EBITB= Rs. 1000000

(ii) DOL = $\frac{Contribution}{EBIT}$

Contribution = DOL X EBIT

Contribution = 4 x 1,50,000

Contribution A = 6,00,000

Contribution B = 15,00,000

Contribution C = 25,00,000

(iii) Fixed Cost = Contribution – EBIT

Fixed Cost A = 6,00,000 – 1,50,000 = Rs 4,50,000

Fixed Cost B = 15,00,000 – 5,00,000 = Rs 10,00,000

Fixed Cost C = 25,00,000 – 10,00,000 = Rs 15,00,000

(iv) Contribution = Sales – VC

Sales A = 6,00,000 / 40% = 15,00,000

Sales B = 15,00,000 / 50% = 30,00,000

Sales C = 25,00,000 / 40% = 41,66,667

QUESTION 15 : PAPER – MAY 2023

The following details of Shiva Ltd for the year ended 31st March 2023 are given below:

Operating Leverage	1.4
Combined Leverage	2.5
Fixed Cost (Excluding Interest)	Rs. 2.04 Lakhs
Sales	Rs. 30 Lakhs

12% Debentures of Rs. 10 each	Rs. 21.25 Lakhs
Equity share capital of Rs. 10 each	Rs. 17 Lakhs
Income tax rate	30%

Required:

i. Calculate P/V ratio and Earnings Per Share (EPS)

ii. If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?

iii. Financial Leverage

SOLUTION :

I) P/V Ratio End Earning Per Share (EPS) :

$$\text{Operating leverage} = \frac{Contribution\ (C)}{Contribution - Fixed\ Cost\ (F)}$$

$$1.4 = \frac{C}{C - 2{,}04{,}000}$$

Or, C =1.4 (C 2,04,000)

Or, C =1.4 C -2,85,600

Or, Contribution = 7,14,000

$$\text{Now , P/V Ratio} = \frac{Contribution\ (C)}{Sales\ (S)} \times 100 = \frac{7{,}14{,}000}{30{,}00{,}000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = 23.80%

EBT = Contribution – Fixed Cost -interest

= 7,14,000 – 2,04,000 – (12% × 21,25,000)

= 5,10,000 – 2,55,000

= 2,55,000

PAT = EBT (1-T) = 2,55,000 (1-0.3) = 1,78,500

$$EPS = \frac{Profit\ After\ Tax}{No\ of\ Equity\ Shares}$$

$$EPS = \frac{1{,}78{,}500}{1{,}70{,}000\ Shares} = 1.05$$

II) Assets turnover :

$$\text{Assets turnover} = \frac{Sales}{Total\ Assets} = \frac{30{,}00{,}000}{17{,}00{,}000 + 21{,}25{,}000}\ 0.7843$$

$0.7843 < 1.5$ means lower than industry turnover.

*Total Assets = Equity Share capital + 12% Debentures

III) Financial Leverage :

Combined Leverage = Operating Leverage (OL)× Financial Leverage (FL)
2.8 = 1.4 × FL
Or, FL = 2

Financial Leverage = 2

QUESTION 16 : PAPER – MAY 2024

Alpha Limited has provided following information :

Equity Share Capital	25,000 Shares @ Rs.100 per Share
15% Debentures	10,000 Debentures @ Rs.750/- per Debentures
Sales	50 Lakhs units @ Rs.20 per unit
Variable Cost	Rs.12.50 per unit
Fixed Costs	Rs.175.00 Lakhs

Due to recent policy changes and entry of foreign competitors in the sector, Alpha Limited experts the sales may decline by 15-20%, however, selling price and other costs will remain the same. Corporate Taxes will continue @20%.

You are required to calculate the decrease in Earnings per share, Degree of Operating Leverage and Financial Leverage separately if sales are declined by (i) 15%; and (ii) 20%.

Thanks ….

CHAPTER 5

COST OF CAPITAL

QUESTION 1 : MTP – MAR 2018

G Limited has the following capital structure, which it considers to be optimal:

Capital Structure	Weightage (in %)
Debt	25
Preference Shares	15
Equity Shares	60
	100

G Limited's expected net income this year is Rs 34,285.72, its established dividend payout ratio is 30 per cent its tax rate is 40 percent, and investors expect earnings and dividends to grow at a constant rate of 9 percent in the future. It paid a dividend of Rs 3.60 per share last year, and its shares currently sells at a price of Rs 54 per share.

G Limited requires additional funds which it can obtain in the following ways:

Preference Shares: New preference shares with a dividend of Rs.11 can be sold to the public at a price of Rs.95 per share.

Debt: Debt can be sold at an interest rate of 12 per cent. You are required to:

DETERMINE the cost of each capital structure component; and

COMPUTE the weighted average cost of capital (WACC) of G Limited.

SOLUTION :

(i) Computation of Costs of Different Components of Capital:

(a) Equity Shares:

$$Ke = \frac{D1}{P0} + g = \frac{D0(1+g)}{P0} + g$$

$$= \frac{Rs\ 3.60(1.09)}{Rs\ 54} = 0.09 = 0.0727 + 0.09 = 16.27\%$$

(b) Preference Shares:

$$Kp = \frac{Preference\ Share\ Devidend}{Fo}$$

$$= \frac{Rs\ 11}{Rs\ 95} = 11.58\%$$

(c) Debt at 12%
kd(1-t)=12%(1-0.4)=12%× $0.6 = 7.20\%$

(ii) Weighted Average Cost of Capital (WACC)
WACC = WdKd + WpKp + WeKe
WACC = 0.25 (7.2%) + 0.15 (11.58%) + 0.60 (16.27%)
= 1.8 + 1.737 + 9.762 = 13.30%.

QUESTION 2 : MTP – AUG 2018 / MTP – OCT 2018 / RTP – NOV 2019

PQR Ltd. has the following capital structure on October 31, 2018:

Sources of capital	**(Rs.)**
Equity Share Capital (2,00,000 Shares of Rs.10 each)	20,00,000
Reserves & Surplus	20,00,000
12% Preference Shares	10,00,000
9% Debentures	30,00,000
	80,00,000

The market price of equity share is Rs. 30. It is expected that the company will pay next year a dividend of Rs. 3 per share, which will grow at 7% forever. Assume 40% income tax rate.
You are required to COMPUTE weighted average cost of capital using market value weights.

SOLUTION :

Workings:

(i) Cost of Equity
=ke =e = $\frac{D1}{P0}$ + g = $\frac{Rs\ 3}{Rs\ 30}$ + 0.07 = 0.17%

(ii) Cost of Debentures (Kd) = I (1 - t) = 0.09 (1 - 0.4) = 0.054 or 5.4%
Computation of Weighted Average Cost of Capital (WACC using market value weights)

Source of capital	**Market Value of capital (Rs.**	**Weight**	**Cost of capital (%)**	**WACC (%)**
9% Debentures	30,00,000	0.30	5.40	1.62
12% Preference Shares	10,00,000	0.10	12.00	1.20
Equity Share Capital (Rs.30 × 2,00,000 shares)	60,00,000	0.60	17.00	10.20
Total	1,00,00,000	1.00		13.02

QUESTION 3 : MTP – OCT 2018 / RTP – MAY 2020

JKL Ltd. has the following book-value capital structure as on March 31, 2018.

	(Rs.)
Equity share capital (2,00,000 shares)	40,00,000
11.5% Preference shares	10,00,000
10% Debentures	30,00,000

	80,00,000

The equity shares of the company are sold at Rs. 20. It is expected that the company will pay next year a dividend of Rs. 2 per equity share, which is expected to grow by 5% p.a. forever. Assume a 35% Corporate tax rate.

Required:

(i) COMPUTE weighted average cost of capital (WACC) of the company based on the existing capital structure.

(ii) COMPUTE the new WACC, if the company raises an additional Rs. 20 lakhs debt by issuing 12% debentures. This would result in increasing the expected equity dividend to Rs. 2.40 and leave the growth rate unchanged, but the price of equity share will fall to Rs.16 per share.

SOLUTION :

(i) Computation of Weighted Average Cost of Capital based on existing capital structure

Source of Capital	Existing Capital structure (Rs.)	Weights	After tax cost of capital (%)	WACC (%)
		(a)	(b)	(a) × (b)
Equity share capital (W.N.1)	40,00,000	0.500	15.00	7.500
11.5% Preference share capital	10,00,000	0.125	11.50	1.437
(W.N.2)				
10% Debentures (W.N.3)	30,00,000	0.375	6.50	2.438
	80,00,000	1.000		11.375

Working Notes (W.N.)

1. Cost of equity capital:

$$Ke = \frac{Expected\ Dividend\ (D1)}{Current\ market\ price\ per\ Share(P0)} + Growth\ (g)$$

$$= \frac{Rs\ 2}{Rs\ 20} + 0.05 = 0.15\ or\ 15\%$$

2. Cost of preference share capital: $= \frac{Annual\ preference\ share\ dividend\ (PD)}{Net\ procesds\ in\ the\ issue\ of\ preference\ share(NP)}$

$$= \frac{Rs\ 1{,}15{,}000}{Rs\ 1{,}00{,}000}$$

3. Cost of 10% Debentures: $\frac{1(1-t)Rs\ 3{,}00{,}000(1-0.35)}{NP-Rs\ 3{,}00{,}000} = 0.065\ or\ 6.5\%$

(ii) Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure (Rs.)	Weights	After tax cost of capital (%)	WACC (%)
		(b)	(a)	(a) × (b)
Equity share capital (W.N. 4)	40,00,000	0.40	20.00	8.00
Preference share (W.N. 2)	10,00,000	0.10	11.50	1.15
10% Debentures (W.N. 3)	30,00,000	0.30	6.50	1.95

12% Debentures (W.N.5)	20,00,000	0.20	7.80	1.56
	1,00,00,000	1.00		12.66

Working Notes (W.N.):

4. Cost of equity capital:

$$\text{Ke} = \frac{\text{Expected Dividend (D1)}}{\text{Current Market Pr ice per share (P0)}} + \text{Growth (g)}$$

$$\frac{Rs\ 2.40}{Rs\ 16} + 5\% = 20\%$$

5. Cost of 12% Debentures :

$$\text{Kd} = \frac{2,40,000(1-0.35)}{Rs\ 20,00,000} = 0.078\ or\ 7.8\%$$

QUESTION 4 : RTP – MAY 2019

As a financial analyst of a large electronics company, you are required to DETERMINE the weighted average cost of capital of the company using (a) book value weights and (b) market value weights. The following information is available for your perusal.

The Company's present book value capital structure is:

	(Rs)
Debentures (Rs 100 per debenture)	8,00,000
Preference shares (Rs100 per share)	2,00,000
Equity shares (Rs10 per share)	10,00,000
	20,00,000

All these securities are traded in the capital markets. Recent prices are:
Debentures, Rs110 per debenture, Preference shares, Rs120 per share, and Equity shares, Rs 22 per share Anticipated external financing opportunities are:

(i) Rs 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, Rs100

(ii) Rs100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, Rs100.

(iii) Equity shares: Rs 2 per share flotation costs, sale price = Rs 22.

In addition, the dividend expected on the equity share at the end of the year is Rs 2 per share, the anticipated growth rate in dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 per cent.

SOLUTION :

Determination of specific costs:

(i) Cost Debt(Kd) $= \frac{Interest(1-t) + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{\text{Rs}.11(120.35) + \frac{(\text{Rs}100-\text{Rs}96)}{10\ \text{Years}}}{\frac{(Rs100+Rs96)}{2}}$

(ii) Cost of Preference Shares(Kp) $= \frac{PD + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{Rs\ 12 + \frac{(Rs100-Rs95)}{10 Years}}{\frac{(Rs\ 100+Rs95)}{2}}$

$= \frac{Rs\ 12 + Rs\ 0.5}{Rs\ 97.5}$ = 0.1282 or 12.82%

(iii) Cost of Equity Shares (Ke) = $\frac{D1}{P0}$ + G = $\frac{Rs\ 2}{Rs\ 22 - Rs\ 2}$ + 0.07= 0.17 or 17%

I - Interest, t - Tax, RV- Redeemable value, NP- Net proceeds, N- No. of years, PD- Preference dividend,

D1- Expected Dividend, P0- Price of share (net)

Using these specific costs we can calculate WACC on the basis of book value and market value weights as follows:

(a) Weighted Average Cost of Capital (K0) based on Book value weights

Source of capital	Book value (Rs)	Weights	Specific cost (%)	WACC (%)
Debentures	8,00,000	0.40	7.70	3.08
Preferences shares	2,00,000	0.10	12.82	1.28
Equity shares	10,00,000	0.50	17.00	8.50
	20,00,000	1.00		12.86

(b) Weighted Average Cost of Capital (K0) based on market value weights:

Source of capital	Market value (Rs)	Weights	Specific cost(%)	WACC(%)
Debentures ($\frac{Rs\ 8,00,000}{Rs\ 100}$ ×Rs 110)	8,80,000	0.265	7.70	2.04
Preferences shares ($\frac{Rs\ 2,00,000}{Rs\ 100}$ ×Rs 120)	2,40,000	0.072	12.82	0.92
Equity shares ($\frac{Rs\ 10,00,000}{Rs\ 10}$)	22,00,000	0.663	17.00	11.27
	33,20,000	1.000		14.23

QUESTION 5 : MAY 2019

Alpha Ltd has furnished the following information (May 2019)

- Earnings Per Share (EPS) Rs.4
- Dividend payout ratio 25%
- Market price per share Rs. 50
- Rate of tax 30%
- Growth rate of dividend 10%

The company wants to raise additional capital of Rs. 10 Lakhs including debt of Rs. 4 lakhs. The cost of debt (before tax) is 10% up to Rs. 2 lakhs and 15% beyond that. Compute the after tax cost of equity and debt and also weighted average cost of capital

SOLUTION :

(i) **Cost of Equity Share Capital** (K_e)

$$K_e = \frac{D_0(1+g)}{P_0} + g = \frac{25\% \text{ of Rs. } 4\ (1+0.10)}{Rs.\ 50} + 0.10 = 0.122 \text{ or } 12.2\%$$

(ii) **Cost of Debt** (K_d)

$$K_d = \frac{Interest}{Net \text{ Proceeds}} \text{ x } 100 \text{ x } (1\text{-}t)$$

Interest on First Rs. 2,00,000 @10% = Rs. 20,000
Interest on next Rs. 2,00,000 @15% = Rs. 30,000

$$K_d = \frac{50,000}{4,00,000} \text{ x } (1\text{- } 0.3) = 0.0875 \text{ or } 8.75\%$$

(iii) **Weighted Average Cost of Capital (WACC)**

Source of capital	Amount (Rs)	Weights	Cost of Capital (%)	WACC (%)
Equity Shares	6,00,000	0.60	12.20	7.32
Debt	4,000,000	0.40	8.75	3.50
Total	10,00,000	1.00		10.82

Alternatively Cost of Equity Share Capital (K_e) **can be calculated as**

$$K_e = \frac{D}{P_0} + g = \frac{25\% \text{ of Rs. } 4}{Rs.50} + 0.10 = \frac{Rs.1.00}{Rs.50} + 0.120 \text{ or } 12.00\%$$

Accordingly

Weighted Average Cost of Capital (WACC)

Source of capital	Amount (Rs)	Weights	Cost of Capital (%)	WACC (%)
Equity Shares	6,00,000	0.60	12.00	7.20
Debt	4,000,000	0.40	8.75	3.50
Total	10,00,000	1.00		10.70

QUESTION 6 : MTP – OCT 2019 / RTP – MAY 2019

ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2019

	(Rs.)
14% Debentures	30,00,000
11% Preference shares	10,00,000
Equity Shares (10,000 shares)	1,60,00,000
	2,00,00,000

The company share has a market price of Rs. 236. Next year dividend per share is 50% of year 2019 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (Rs.)	Year	EPS Rs.)
2010	10.00	2015	16.10
2011	11.00	2016	17.70

2012	12.10	2017	19.50
2013	13.30	2018	21.50
2014	14.60	2019	23.60

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is Rs. 96.

Preference share Rs. 9.20 (with annual dividend of Rs. 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) CALCULATE after tax:
- (i) Cost of new debt
- (ii) Cost of new preference shares
- (iii) New equity share (consuming new equity from retained earnings)

(B) CALCULATE marginal cost of capital when no new shares are issued.

(C) COMPUTE the amount that can be spent for capital investment before new ordinary shares must be sold. Assuming that retained earnings for next year9s investment are 50 percent of 2019.

(D) COMPUTE marginal cost of capital when the funds exceeds the amount calculated in (C), assuming new equity is issued at Rs. 200 per share?

SOLUTION :

(A) (I) Cost of new debt

$$Kd=\frac{1(1-t)}{P0}$$

$$=\frac{16(1-0.5)}{96}$$

$$=0.0833$$

(ii) Cost of new preference shares

$$Kp=\frac{PD}{P0}=\frac{1.1}{9.2}=0.12$$

(iii) Cost of new equity shares

$$Ke=\frac{D1}{P0}+g=\frac{11.80}{236}+0.10=0.05+0.10=0.15$$

Calculation of D1

D1 = 50% of 2019 EPS = 50% of 23.60 = Rs. 11.80

(B) Calculation of marginal cost of capital

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debenture	0.15	0.0833	0.0125
Preference Share	0.05	0.12	0.0060
Equity Share	0.80	0.15	0.1200
	Marginal cost of capital		0.1385

(C) The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:
Retained earnings = (0.50) (236 × 10,000) = Rs. 11,80,000
The ordinary equity (Retained earnings in this case) is 80% of total capital 11,80,000 = 80% of Total Capital
Capital investment before issuing equity
$\frac{Rs\ 11{,}80{,}000}{0.80} = Rs14{,}75{,}000$

(D) If the company spends in excess of Rs.14,75,000 it will have to issue new shares.
The cost of new issue will be $\frac{Rs\ 11.80}{200} + 0.10 = 0.159$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debenture	0.15	0.0833	0.0125
Preference Shares	0.05	0.1200	0.0060
Equity Shares (New)	0.80	0.1590	0.1272
			0.1457

QUESTION 7 : NOV 2019

A Company wants to raise additional finance of Rs. 5 crore in the next year.
The company expects to retain Rs. 1 crore earning next year. Further details are as follows :
(i) The amount will be raised by equity and debt in the ratio of 3:1
(ii) The additional issue of equity shares will result in price per share being fixed at Rs. 25
(iii) The debt capital raised by way of term loan will cost 10% for the first Rs. 75 lakh and 12% for the next Rs. 50 lakhs
(iv) The net expected dividend on equity shares is Rs. 2.00 per share. The dividend is expected to grow at the rate of 5%
(v) Income tax rate is 25%

You are required:

a. To determine the amount of equity and debt for raising additional finance.
b. To determine the post-tax average cost of additional debt
c. To determine the cost of retained earnings and cost of equity
d. To compute the overall weighted average cost of additional finance after tax

SOLUTION :

(a) Determination of the amount of equity and debt for raising additional finance:

Pattern of raising additional finance

Equity	3/4th of Rs. 5 Crore	= Rs. 3.75 Crore
Debt	1/4th of Rs. 5 Crore	= Rs. 1.25 Crore

The capital structure after raising additional finance:

Particulars	(Rs. In Crore)

Shareholder's Funds		
Equity Capital	(3.75 – 1.00)	2.75
Retained Earnings		1.00
Debt (Interest at 10% p.a.)		0.75
(Interest at 12% p.a.)	(1.25 – 0.75)	0.50
Total Funds		5.00

(b) Determination of post-tax average cost of additional debt

$K_d = I(1 - t)$

Where,

I = Interest rate

t = Corporate tax – rate

On Rs. 75,00,000 = 10% (1 – 0.25) = 7.5% or 0.075

On Rs. 50,00,000 = 12% (1 – 0.25) = 9% or 0.09

Average Cost of Debt

$$= \frac{(Rs.\ 75,00,000 \times 0.075) + (Rs.\ 50,00,000 \times 0.09)}{1,25,00,000} \times 100$$

$$= \frac{Rs.\ 5,62,500 + Rs.\ 4,50,000}{1,25,00,000} \times 100 = 8.10\%$$

(c) Determination of cost of retained earnings and cost of equity (Applying Dividend growth model)

$$K_e = \frac{D_1}{P_0} + g$$

Where,

K_e = Cost of equity

D_1 = $D_0(1 + g)$

D_0 = Dividend paid (i.e. = Rs.2)

g = Growth rate

P_0 = Current market price per share

Then, $K_e = \frac{Rs.\ 2(1.05)}{Rs.\ 25} + 0.05 = \frac{Rs.\ 2.1}{Rs.\ 25} + 0.05 = 0.084 + 0.05 = 0.134 = 13.4\%$

Cost of retained earnings equals to cost of Equity i.e. 13.4%

(d) Computation of overall weighted average after tax cost of additional finance

Particulars	**Rs.**	**Weights**	**Cost of funds**	**Weighted Cost (%)**
Equity (including retained earnings)	3,75,00,000	3/4	13.4%	10.05
Debt	1,25,00,000	1/4	8.1%	2.025
WACC	5,00,00,000			12.075

QUESTION 8 : RTP – NOV 2020 / MTP – MAY 2021

CALCULATE the WACC by using Market value weights. The capital structure of the company is as under:

	(Rs.)
Debentures (Rs.100 per debenture)	10,00,000
Preference shares (Rs.100 per share)	10,00,000
Equity shares (Rs.10 per share)	20,00,000
	40,00,000

The market prices of these securities are:

Debentures Rs.115 per debenture
Preference shares Rs. 120 per preference share
Equity shares Rs. 265 each

Additional information:

(1) Rs.100 per debenture redeemable at par, 10% coupon rate, 2% floatation cost, 10-year maturity.

(2) Rs.100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10 – year maturity.

(3) Equity shares have a floatation cost of Rs. 1 per share.
The next year expected dividend is Rs. 5 with an annual growth of 15%. The firm has the practice of paying all earnings in the form of dividend. Corporate tax rate is 30%. Use YTM method to calculate cost of debentures and preference shares.

SOLUTION :

(i) Cost of equity (Ke)

$$\frac{D}{Po-F} + g = \frac{Rs\ 5}{Rs\ 265-Rs1} + 0.15 = 0.1689\ or\ 16.89\%$$

(ii) Cost of Debt (Kd)

Calculation of NPV at discount rate of 5% and 7%

Year	Cash flows (Rs.)	Discount factor @5%	Present Value	Discount factor @7%	Present Value (Rs.)
0	112.7	1.000	(112.7)	1.000	(112.7)
1 to 10	7	7.722	54.05	7.024	49.17
10	100	0.614	61.4	0.508	50.8
NPV			+2.75		–12.73

Calculation of IRR

IRR = $5\% + \frac{2.75}{2.75-(-12.73)}\ (7\% - 5\%) = 5\% + \frac{2.75}{15.48}(7\% - 5\%) = 5.36\%$

Cost of Debt (Kd) = 5.36%

(iii) Cost of Preference shares (Kp)

Calculation of NPV at discount rate of 2% and 5%

Year	Cash flows (Rs.)	Discount factor @ 2%	Present Value	Discount factor @ 5%	Present Value (Rs.)
0	117.6	1.000	(117.6)	1.000	(117.6)
1 to 10	5	8.989	44.92	7.722	38.61
10	100	0.820	82.00	0.614	61.40
NPV			+9.32		-17.59

Calculation of IRR

IRR = $2\%+\frac{9.32}{9.32-(-17.59)}(5\%-2\%) = 2\% + \frac{9.32}{26.91=3.04\%}$

Cost of Preference Shares (Kp) = 3.04%

Calculation of WACC using market value weights

Source of capital	Market Value	Weights	After tax cost of capital	WACC (Koi)
	(Rs.)	(a)	(b)	(c) = (a) × (b)
10% Debentures (Rs.115 × 10,000)	11,50,000	0.021	0.0536	0.00113
5% Preference shares	12,00,000	0.022	0.0304	0.00067
(Rs.120 × 10,000)				
Equity shares (Rs.265 × 2,00,000)	5,30,00,000	0.957	0.1689	0.16164
	5,53,50,000	1.000		0.16344

WACC (Ko) = 0.16344 or 16.344%

QUESTION 9 : JAN 2021

The Capital structure of PQR is as follows

	Rs.
10% Debenture	3,00,000
12% Preference Shares	2,50,000
Equity Share (face value Rs. 10 per share	5,00,000
	10,50,000

Additional Information:

(i) Rs. 100 per debenture redeemable at par has 2% floatation cost & 10 years of maturity. The market price per debenture is Rs. 110.

(ii) Rs. 100 per preference share redeemable at par has 3% floatation cost & 10 years of maturity. The market price per preference share is Rs. 108

(iii) Equity share has Rs. 4 floatation cost and market price per share of Rs. 25. The next year expected dividend is Rs. 2 per share with annual growth of 5%. The firm has a practice all earnings in the form of dividends.

(iv) Corporate Income Tax rate is 30%

Required :

Calculate Weighted Average Cost of Capital (WACC) using market value weights.

SOLUTION :

Workings :

1. $\text{Cost of Equity } (K_e) = \frac{D_1}{P_0 - F} + g = \frac{Rs.\ 2}{Rs.\ 25 - Rs.\ 4} + 0.05 = 0.145 \text{ (approx.)}$

2. $\text{Cost of Debt } (K_d) = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$

$$= \frac{10(1-0.3) + \frac{(100 - 98)}{10}}{\frac{(100 + 98)}{2}} = \frac{7 + 0.2}{99} = 0.073 \text{ (approx.)}$$

3. $\text{Cost of Preference Shares } (K_p) = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$

$$= \frac{12 + \frac{(100 - 97)}{10}}{\frac{(100 + 97)}{2}} = \frac{12 + 0.3}{98.5} = 0.125 \text{ (approx.)}$$

Calculation of WACC using market value weights

Source of Capital	Market Value (Rs)	Weights (a)	After tax cost of capital (b)	WACC (K_e) c = a x b
10% Debentures (Rs. 110 x 3,000)	3,30,000	0.178	0.073	0.013
12% Preference shares (Rs. 108 x 2,500)	2,70,000	0.146	0.125	0.018
Equity shares (Rs. 25 x 50,000)	12,50,000	0.679	0.145	0.098
	18,50,000	1.00		0.129

QUESTION 10 : PAPER - JULY 2021

Following are the information of TT Ltd :

Particulars	
Earnings per share	Rs. 10
Dividend per share	Rs. 6

Expected growth rate in Dividend	6%
Current market price per share	Rs. 120
Tax Rate	30%
Requirement of Additional Finance	Rs. 30 Lakhs
Debt Equity Ratio (For additional finance)	2:1
Cost of Debt 0 – 5,00,000 5,00,001 – 10,00,000 Above 10,00,000	 10% 9% 8%

Assuming that there is no Reserve and Surplus available in TT Ltd.

You are required to :

a. Find the pattern of finance for additional requirement

b. Calculate post tax average cost of additional debt

c. Calculate cost of equity

d. Calculate the overall weighted average after tax cost of additional finance.

SOLUTION :

(a) Pattern of raising additional finance

Equity 1/3 of Rs. 30,00,000 = Rs. 10,00,000

Debt 2/3 of Rs. 30,00,000 = Rs. 20,00,000

The capital structure after raising additional finance

Particulars		**Rs.**
Shareholder's Funds		
Equity Capital		10,00,000
Debt (Interest at 10% p.a)		5,00,000
(Interest at 9% p.a.)		5,00,000
(Interest at 8% p.a.)	(20,00,000 – 10,00,000)	10,00,000
Total Funds		30,00,000

(b) Determination of post – tax average cost of additional debt

$K_d = I (1 - t)$

Where,

I = Interest Rate

t = Corporate tax – rate

On First Rs. 5,00,000 = 10% (1 – 0.3) = 7% or 0.07

On Next Rs. 5,00,000 = 9% (1 – 0.3) = 6.3% or 0.063

On Next Rs. 10,00,000 = 8% (1 – 0.3) = 5.6% or 0.056

Average Cost of Debt

$$= \frac{Rs.\ 5,00,000 \times 0.07 + (Rs.\ 5,00,000 \times 0.063) + (Rs.\ 10,00,000 \times 0.056)}{Rs.\ 20,00,000} \times 100 = 6.125\%$$

(c) Determination of cost of equity applying Dividend growth mode:

$$K_e = \frac{D_1}{P_0} + g$$

Where,

K_e = Cost of equity

D_1 = $D_0 (1+g)$

D_0 = Dividend paid

g = Growth rate = 6%

P_0 = Current market price per share = Rs. 120

$$K_e = \frac{Rs.\ 6(1+0.06)}{Rs.120} + 0.06 = \frac{Rs.6.36}{Rs.\ 120} + 0.06 = 0.113 \text{ or } 11.3\%$$

(d) Computation of overall weighted average after tax cost of additional finance

Particulars	(Rs)	Weights	Cost of funds	Weighted Cost (%)
Equity	10,00,000	1/3	11.3%	3.767
Debt	20,00,000	2/3	6.125%	4.083
WACC	30,00,000			7.85

(Note : In the above solution different interest rate have been considered for different slab of Debt)

QUESTION 11 : MTP – NOV 2021 / MAY 2022 / SEP 2023

XYZ Company's equity share is quoted in the market at ¹ 25 per share currently. The company pays a dividend of ¹ 5 per share and the investor9s market expects a growth rate of 5% per year. You are required to:

(i) CALCULATE the company9s cost of equity capital.

(ii) If the company issues 12% debentures of face value of Rs.100 each and realizes Rs.95 per debenture while the debentures are redeemable after 10 years at a premium of 12%, CALCULATE cost of debenture using YTM?

Assume tax rate to be 30%.

SOLUTION :

(i) Cost of Equity Capital (Ke)

$$\frac{\text{Expecteddividendper share(D1)}}{\text{Marketpriceper share(P0)}} = \text{Growth rate(g)}$$

$$\frac{\text{Rs } 5\times 1.05}{\text{Rs } 25} = + 0.05 = 26\%$$

(ii) Cost of Debenture (Kd):

Using Present Value method (or YTM)

Identification of relevant cash flows

Year	Cash flows
0	Current market price (P0) = Rs.95
1 to 10	Interest net of tax [I(1-t)] = 12% of Rs.100 (1 3 0.30) = Rs.8.40
10	Redemption value (RV) = Rs.100 (1.12) = Rs.112

Calculation of Net Present Values (NPV) at two discount rates

Year	Cash flows	Discount factor @ 9% (L)	Present Value	Discount factor @ 10% (H)	Present Value
0	(95)	1.0000	(95.00)	1.0000	(95.00)
1 to 10	8.40	6.4176	53.91	6.1445	51.61
10	112	0.4224	47.31	0.3855	43.18
					-0.21

Calculation of IRR=

IRR = $L\frac{NPVl}{NPVlNPVh}$(H-L)

= $9\%+\frac{6.22}{6.222(20.21)}$(10%-9%)==$9\%+\frac{6.22}{6.43}$

= Therefore, Kd = 9.97%

QUESTION 12 : DEC 2021

Book value of capital structure of B Ltd is as follows :

Sources	Amount
12%, 6,000 Debentures @ Rs. 100 Each	Rs. 6,00,000
Retained earnings	Rs. 4,50,000
4,500 Equity shares @ Rs. 100 Each	Rs. 4,50,000
	Rs. 15,00,000

Currently, the market value of debenture is Rs. 110 per debenture and equity share is Rs. 180 per share. The expected rate of return to equity shareholder is 24% p.a. Company is paying tax @30%. Calculate WACC on the basis of market value weights.

SOLUTION :

Calculation of Cost of Capital of debentures ignoring market value:

Cost of Debentures (K_d) = 12 (1 - .30) = 8.40%

Computation of Weighted Average Cost of Capital based on Market Value Weights

Source of Capital	Market Value (Rs.)	Weights to Total Capital	After tax Cost of capital (%)	WACC (%)
Debentures (6,000 nos. × Rs. 110)	6,60,000	0.45(approx.)	8.40	3.78

Equity Shares (4,500 nos. × Rs. 180)	8,10,000	0.55(approx.)	24.00	13.20
	14,70,000	**1.00**		**16.98**

Note: Cost of Debenture and Cost of equity considered as given without considering market value. Cost of sources of capital can be computed based on the Market price and accordingly Weighted Average Cost of Capital can be calculated as below:

Calculation of Cost of Capital for each source of capital considering market value of capital:

(1) Cost of Equity share capital:

$$K_e = \frac{Earnings}{Market\ \text{Price per share}} = \frac{24\%\ \text{x Rs. } 100}{Rs.\ 180} = 13.333\%$$

(2) Cost of Debentures : $(K_d) = \frac{I(1-t)}{NP} = \frac{Rs.12(1-0.3)}{Rs.110} = 7.636\%$

Computation of Weighted Average Cost of Capital based on Market Value Weights

Source of Capital	Market Value (Rs.)	Weights to Total Capital	After tax Cost of capital (%)	WACC (%)
Debentures (6,000 nos. × Rs. 110)	6,60,000	0.45(approx.)	7.636	3.44 (Approx.)
Equity Shares (4,500 nos. × Rs. 180)	8,10,000	0.55(approx.)	13.333	7.33 (Approx.)
	14,70,000	**1.00**		**10.77 (Approx.)**

QUESTION 13 : RTP – MAY 2022

The information relating to book value (BV) and market value (MV) weights of Ex Limited is given below:

Sources	Book Value	Market Value
Equity shares	2,40,00,000	4,00,00,000
Retained earnings	60,00,000	-
Preference shares	72,00,000	67,50,000
Debentures	18,00,000	20,80,000

Additional information:

I. Equity shares are quoted at Rs.130 per share and a new issue priced at Rs.125 per share will be fully subscribed; flotation costs will be Rs.5 per share on face value.

II. During the previous 5 years, dividends have steadily increased from Rs.10 to Rs16.105 per share. Dividend at the end of the current year is expected to be Rs.17.716 per share.

III. 15% Preference shares with face value of Rs.100 would realise Rs. 105 per share.

IV. The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2% on face value.

V. Corporate tax rate is 30%.

You are required to DETERMINE the weighted average cost of capital of Ex Limited using both the weights.

SOLUTION :

(i) Cost of Equity (Ke) = $\frac{D1}{Po-F} + g = \frac{Rs.17.716}{Rs.125-Rs.5} + 0.10$

Ke = 0.2476

Calculation of g :

Rs.10$(1+g)^5$= Rs.16.105

Or, $(1=g)^5$=$\frac{16.105}{10}$=1.6105

Table (FVIF) Suggests that Rs. 1 Compounds to Rs. 1.6105 in years at the Compound rate 10 percent . Therefore, g is 10 per cent.

(ii) Cost of Retained Earnings (Kr)=$\frac{D1}{Po} + g = \frac{Rs.17716}{Rs.130} + 0.10 = 0.2363$

(iii) Cost of Preference Shares (Kp) = $\frac{PD}{Po} = \frac{Rs.15}{Rs.105} = 0.1429$

(iv) Cost of Debentures (Kd) = $\frac{1(1-t)+(\frac{RV-Np}{n})}{\frac{RV+NP}{2}}$

= $\frac{.Rs15\times0.70+Rs.0.75}{95.875}$ = $\frac{11.25}{.95.875}$ =0.1173

*Since yield on similar type of debentures is 16 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

= Rs.15 ÷ 0.16 = Rs.93.75

Market value (P0) of debentures can also be found out using the present value method:

P0 = Annual Interest × PVIFA (16%, 11 years) + Redemption value × PVIF (16%, 11 years)

P0 = Rs. 15 × 5.0287 + Rs.100 × 0.1954 P0 = Rs.75.4305 + Rs19.54 = Rs. 94.9705

Net Proceeds = Rs 94.9705 3 2% of Rs.100 = Rs.92.9705 Accordingly, the cost of debt can be calculated

Sale proceeds from debentures = Rs.93.75 3 –RS. 2 (i.e., floatation cost) = Rs91.75

Total Cost of capital [BV weights and MV weights]

(Amount in Rs lakh)

Source of capital	Weights		Specific Cost (K)	Total cost	
	BV	MV		(BV × K)	(MV × K)
Equity Shares	240	320**	0.2476	59.4240	79.2320
Retained Earnings	60	80**	0.2363	14.1780	18.9040
Preference Shares	72	67.50	0.1429	10.2888	9.6458
Debentures	18	20.80	0.1173	2.1114	2.4398
Total	390	488.30		86.0022	110.2216

Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings i.e., 240:60 or 4:1.

Weighted Average Cost of Capital (WACC):

Using Book Value =$\frac{RS\ 86.0022}{Rs390} = 0.2205\%$

Using Market Value = $\frac{Rs.110.2216}{Rs\ 488.30} = 0.2257\ or\ 22.57\%$

QUESTION 14 : PAPER – MAY 2022

A company issues:

- 15% convertible debentures of Rs. 100 each at par with maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk – free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of Rs. 12.76 per share. Five year ago, it paid dividend of Rs. 10 per share. Floatation cost is 5% of issue amount.
- 5% preference shares of Rs. 100 each at premium of 10%. These shares are redeemable after 10 years at par. Floatation cost is 6% of issue amount.

Assuming corporate tax rate is 40%

i. Calculate the cost of convertible debentures using the approximation method

ii. Use YTM method to calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.0.3,t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.0.5,t}$	0.952	0.907	0.864	0.823	0.746	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.0.3,t}$	0.971	1.913	2.829	3.717	5.417	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.0.5,t}$	0.952	1.859	2.723	3.546	5.076	5.076	5.786	6.463	7.108	7.722

Interest Rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
$FVIF_{i,5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
$FVIF_{i,6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
$FVIF_{i,7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

SOLUTION :

(i) Calculation of Cost of Convertible Debentures:

Given that,

R_F = 10%

$R_m - R_f$ = 18%

B = 1.25

D_0 = 12.76

D_{-5} = 10

Flotation Cost = 5%

Using CAPM,

$K_e = R_f + \beta (R_m - R_f)$

= 10% + 1.25(18%)

= 32.50%

Calculation of growth rate in dividend

12.76 = $10\ (1 + g)^5$

1.276 = $(1 + g)^5$

$(1 + 5\%)^5$ = 1.276 ..... from FV Table

g = 5%

$$\text{Price of share after 6 years} = \frac{D_7}{k_e - g} = \frac{12.76(1.05)^7}{0.325 - 0.05}$$

$$P_6 = \frac{12.76 \times 1.407}{0.275}$$

$P_6 = 65.28$

Redemption Value of Debenture (RV) = 65.28 × 2 = **130.56** (RV)

NP = 95

n = 6

$$K_d = \frac{INT\ (1\text{-}t) + \frac{(RV - NP)}{n}}{\frac{(RV - NP)}{2}} \times 100$$

$$= \frac{15\ (1\text{-}0.4) + \frac{(130.56 - 95)}{6}}{\frac{(130.56 + 95)}{2}} \times 100$$

$$= \frac{9 + 5.93}{112.78} \times 100$$

$K_d = 13.24\%$

(ii) Calculation of Cost of Preference Shares:

Net Proceeds = 100 (1.1) - 6% of 100 (1.1)
= 110 - 6.60
= 103.40

Redemption Value = 100

Year	Cash Flows (Rs.)	PVF @ 3%	PV (Rs.)	PVF @ 5%	PV (Rs)
0	103.40	1	103.40	1	103.40
1-10	-5	8.530	-42.65	7.722	-38.61
10	-100	0.744	-74.40	0.614	-61.40
			-13.65		3.39

$$K_p = 3\% + \frac{5\% - 3\%}{[3.39 - (-13.65)]} \times 13.65$$

$$= 3\% + \frac{2\%}{17.04} \times 13.65$$

$K_p = 4.6021\%$

QUESTION 15 : PAPER – NOV 2022

The following is the extracted of the Balance Sheet of M/s KD Ltd:

Particulars	Amount (Rs)
Ordinary shares (Face Value Rs. 10/- per share)	5,00,000
Share Premium	1,00,000
Retained Profits	6,00,000
8% Preference Shares (Face Value Rs. 25 per share)	4,00,000
12% Debentures (Face Value Rs. 100 each)	6,00,000
	22,00,000

The ordinary shares are currently priced at Rs. 39 ex-dividend and preference shares is priced at Rs. 18 cum dividend. The debentures are selling at 120 percent ex-interest. The applicable tax rate to D Ltd is 30 percent. KD Ltd's cost of equity has been estimated at 19 percent.
Calculate the WACC (Weighted average cost of capital) of KD Ltd. on the basis of market value.

SOLUTION :

Computation of WACC on the basis of market value

W.N. 1

Cum-dividend price of Preference shares = Rs. 18

Less: Dividend (8/100) x 25 = Rs. 2

∴ Market Price of Preference shares = Rs. 16

$$K_p = \frac{2}{16} = 0.125 \text{ (or) } 12.5\%$$

No. of Preference shares $= \left(\frac{4,00,000}{25}\right) = 16,000$

W.N. 2

Market price of Debentures $= \left(\frac{120}{100}\right) \text{ x } 100 = \text{Rs. } 120$

K_d $= \left[\frac{12\ (1 - 0.3)}{120}\right] = 0.07 \text{ or } 7\%$

No. of Debentures $= \left(\frac{6,00,000}{100}\right) = 6,000$

W.N.3

Market Price of Equity shares = Rs.39

K_e (given) = 19% or 0.19

No. of Equity shares $= \frac{5,00,000}{10} = 50,000$

Sources	Market Value (Rs)	Nos.	Total Market value (Rs.)	Weight	Cost of Capital	Product
Equity Shares	39	50,000	19,50,000	0.6664	0.19	0.1266
Preference Shares	16	16,000	2,56,000	0.0875	0.125	0.0109
Debentures	120	6,000	7,20,000	0.2467	0.07	0.0172
					WACC =	0.1547

WACC = 0.1547 or 15.47%

QUESTION 16 : PAPER – NOV 2022

MR Ltd is having the following capital structure, which is considered to be optimum as on 31.03.2022

Equity share capital (50,000 shares)	Rs. 8,00,000
12% Preference share capital	Rs. 50,000
15% Debentures	Rs. 1,50,000
	Rs. 10,00,000

The earnings per share (EPS) of the company were Rs. 2.50 in 2021 and the expected growth in equity dividend is 10% per year. The next year's dividend per share (DPS) is 50% of EPS of the year 2021. The current market price per share (MPS) is Rs. 25.00. The 15% new debentures can be issued by the company. The company's debentures are currently selling at Rs. 96 per debenture. The new 12% Preference share can be sold at net price of Rs. 91.50 (face value Rs. 100 each). The applicable tax rate is 30%.

You are required to calculate

(a) After tax cost of
   i. New debt
   ii. New preference share capital an
   iii. Equity shares assuming that new equity shares come from retained earnings.

(b) Marginal cost of capital
   How much can be spent for capital investment before sale of new equity shares assuming that retained earnings for next year investment is 50% of 2021?

SOLUTION :

(a) (i) After tax cost of new Debt:

$$K_d = I\,\frac{(1-t)}{P_1} = 15\,\frac{(1-0.3)}{96}$$

= 0.1094 (or) **10.94%**

(ii) After tax cost of New Preference share capital:

$$K_P = \frac{PD}{P_0} = \left(\frac{12}{91.5}\right) = 0.1311 \text{ or } 13.11\%$$

(iii) After tax cost of Equity shares:

$$K_e = \left(\frac{D_1}{P_o}\right) + g = \left(\frac{(2.50 \text{ x } 50\%)}{25}\right) + 0.10$$

= 0.15 or 15%

(b) Marginal Cost of Capital

Type of capital	Proportions	Specific cost	Product
Equity Shares	0.80	0.15	0.12
Preference Shares	0.05	0.1311	0.0066
Debentures	0.15	0.1094	0.0164

∴ Marginal cost of capital			**0.1430**

(c) Amount that can be spend for capital investment

Retained earnings = 50% of EPS x No. of outstanding Equity shares
= 1.25 x 50,000
= **Rs. 62,500**

Proportion of equity (Retained earnings here) capital is 80% of total capital. Therefore, Rs. 62,500 is 80% of total capital.

∴ Amount of Capital Investment = $\frac{62,500}{0.80}$ = Rs. 78,125

QUESTION 17 : RTP – MAY 2023

Amrit Corporation has the following book value capital structure:

Equity Capital (50 lakh shares of Rs 10 each).	Rs 5,00,00000
15% Preference share (50,000 shares Rs 100 each)	Rs 50,00,000
Retained earnings	Rs 4,00,00,000
Debentures 14% (2,50,000 debentures Rs 100 each)	Rs 2,50,00,000
Term loan 13%	Rs 4,00,00000

The companies last year earnings per share was Rs 5, and it maintains a dividend pay-out ratio of 60% and returns on equity is 10%. The market price per share is Rs 20.8. Preference share redeemable after 10 years is currently selling for Rs 90 per share. Debentures redeemable after 6 years are currently selling for Rs 75 per debenture. The income tax rate is 40%.

(a) CALCULATE the Weighted Average Cost of Capital (WACC) using market value proportions.

(b) DETERMINE the Marginal Cost of Capital (MACC) if it needs Rs 5,00,00000 next year assuming the amount will be raised by 60% equity, 20% debt and 20% retained earnings. Equity issues will fetch a net price of Rs 14 and cost of debt will be 13% before tax up to Rs 40,00,000 and beyond Rs 40,00,000 it will be 15% before tax.

SOLUTION :

(a) Calculation of Cost of Equity

(i) Do = Rs5x 60%
Do = Rs 3
g = b x r
= (1-0.6) x 10% = 4%
D1 = D0 x (1 + g)
= 3 x (1 + 4%)
= 3 x 1.04 = 3.12
Ke = $\frac{D1}{P0} + g$
Ke = $\frac{3.12}{20.8} + 0.04$
Ke = 19%

(ii) Calculation of Cost of Preference Shares N =10 years

NP = Rs90 PD = RS 15 RV = Rs 100

$Kp = \frac{PD+(RV-NP)/N}{(RV+NP)} \times 100$

$Kp = \frac{15+(100290)/10}{(100+90)/2} \times 100$

Kp = 16/95 x 100

Kp = 16.84%

(iii) Calculation of Cost of Debentures N = 6 years

NP = Rs 75 Interest = Rs 14 RV = Rs 100 T = 40%

$Kd = \frac{int(1-t)+(RV-NP)/N}{(RV+NP)/2} \times 100$

$Kd = \frac{14(120.4)+(100275)/6}{(100+75)/2} \times 100$

$Kd = \frac{8.424.17}{87.5} \times 100$

Kd = 14.37%

(iv) Cost of Term Loan

Kd = Interest rate (1-t)

Kd = 13% (1-40%) Kd = 7.8%

Calculation of Weighted Average Cost of Capital (WACC) (using market weights)

Capital	Cost of Capital	Market Value		Market Value Weights	Product (Cost x weights)
Equity	19.00%	20.8 x 50,00,000	Rs 10,40,00,000	0.6218	11.81%
Preference Shares	16.84%	90 x 50,000	RS 45,00,000	0.0269	0.45%
Debentures	14.37%	75 x 2,50,000	Rs 1,87,50,000	0.1121	1.61%
Term Loan	7.80%		RS 4,00,00,000	0.2392	1.87%
Total			Rs 16,72,50,000	1	15.74%

WACC= 15.74%

(b) Calculation of Marginal Cost of Capital (MACC)

The required capital of ₹ 50,000,000 will be raised as follows: Equity = 60% of Rs.50,000,000 = Rs.30,000,000

Debt = 20% of ₹ 50,000,000 = Rs10,000,000

Retained Earnings= 20% of Rs 50,000,000 = Rs 10,000,000

Marginal Cost of Equity = $\frac{3.12}{1.4} + 0.04$ =26.28%

Marginal Cost of Debt

Cost of Debt (before tax) = $\frac{13\% \text{ of Rs } 40,00,000+15\% \text{ of Rs } 60,00,000}{Rs\ 1,00,00,000}$

= $\frac{Rs\ 5,20,000+Rs\ 9,00,000}{Rs\ 1,00,00,000} = 14.2\%$

Cost of Debt (after tax). = 14.2% (1-t)
= 14.2% (1-0.4)
= 8.52%

Calculation of marginal cost of capital

Capital	Cost of Capital	Value	Weights	Product (Cost weights)
Equity	26.28%	Rs 3,00,00,000	0.6	15.77%
Reserves	26.28%	Rs 1,00,00,000	0.2	5.26%
Debt	8.52%	Rs 1,00,00,000	0.2	1.70%
Total		RS 5,00,00,000	1	22.73%

Marginal Cost of Capital (MACC) = 22.73%

QUESTION 18 : MAY 2023

Following information are given for a company:

Earnings per share	Rs. 10
P/E ratio	12.5
Rate of return on investment	12%
Market price per share as per Walter's Model	Rs. 130

You are required to calculate:

i. Dividend payout ratio
ii. Market price of share at optimum dividend payout ratio
iii. P/E ratio, at which the dividend policy will have no effect on the price of share
iv. Market price of share at this P/E ratio
v. Market price of share using Dividend growth Model

SOLUTION :

(i) The EPS of the firm is Rs. 10, r =12%. The P/E Ratio is given at 12.5 and the cost of capital K_e may be taken as the inverse of P/E ratio. Therefore, K_e is 8% (i.e., 1/12.5). The value of the share is Rs. 130 which may be equated with Walter Model as follows:

$$P = \frac{D+\frac{r}{K_e}(\text{E-D})}{K_e} \text{ or } P = \frac{D+\frac{12\%}{8\%}(10-D)}{8\%}$$

or [D+1.5(10-D)]/0.08=130
or D+15-1.5D=10.4
or -0.5D=-4.6 So,
D = Rs. 9.2
The firm has a dividend pay-out of 92% (i.e., 9.2/10)

(ii) Since the rate of return of the firm (r) is 12% and it is more than the K_e of 8%, therefore, by distributing 92% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be:

$$P = \frac{0 + \frac{12\%}{8\%}(10-0)}{8\%}$$

P = Rs. 187.5

So, theoretically the market price of the share can be increased by adopting a zero pay-out.

(iii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the K_e would be equal to the rate of return (r) of the firm. The K_e would be 12% (= r) at the P/E ratio of 1/12%=8.33. Therefore, at the P/E ratio of 8.33, the dividend policy would have no effect on the value of the share.

(iv) If the P/E is 8.33 instead of 12.5, then the K_e which is the inverse of P/E ratio, would be 12% and in such a situation K_e = r and the market price, as per Walter's model would be:

$$P = \frac{D + \frac{r}{K_e}(\text{E-D})}{K_e} = \frac{9.2 + \frac{0.12}{0.12}(10-9.2)}{0.12} = \text{Rs. } 83.33$$

(v) Dividend Growth Model applying growth on dividend

K_e = 8%, r = 12%, D_0 = 9.2, b = 0.08

g = b.r

g = 0.08 x 0.12=0.96%

$D_1 = D_0 (1+g) = 9.2 (1+0.0096) = \text{Rs. } 9.2883$

$$P = \frac{D_1}{(K_e - g)} = 9.2883/(0.08 - 0.0096) = 9.2883/0.0704 = \text{Rs. } 131.936$$

QUESTION 19 : PAPER – MAY 2023

Capital Structure of D Ltd as on 31st March 2023 is given below:

Particulars	Rs.
Equity share capital (Rs. 10 each)	30,00,000
8% Preference Share capital (Rs. 100 each)	10,00,000
12% Debentures (Rs. 100 each)	10,00,000

- Current market price of equity share is Rs. 80 per share. The company has paid dividend of Rs. 14.07 per share. Seven years ago, it paid dividend of Rs. 10 per share. Expected dividend is Rs. 16 per share
- 8% preference shares are redeemable at 6% premium after five years. Current market price per preference share is Rs. 104
- 12% Debentures are redeemable at 20% premium after 10 years. Floatation cost is Rs. 5 per debenture
- The company is in 40% tax bracket
- In order to finance an expansion plan, the company intends to borrow 15% Long term loan of Rs. 30,00,000 from bank. This financial decision is expected to increase dividend on

equity share from Rs. 16 per share to Rs. 18 per share. However the market price of equity shares is expected to decline from Rs. 80 to Rs. 72 per share, because investors required rate of return is based on current market conditions.

Required:

i. Determine the existing Weighted Average Cost of Capital (WACC) taking book value weights

ii. Compute Weighted Average Cost of Capital (WACC) after the expansion plan taking book value weights.

Interest Rate	1%	2%	3%	4%	5%	6%	7%
$FVIF_{i,5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403
$FVIF_{i,6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501
$FVIF_{i,7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606

SOLUTION :

(i) (a) Growth rate in Dividends

14.07 = 10 x FVIF (i,7 years)

FVIF (i,7 years) = 1.407

FVIF (5%, 7 years) = 1.407

i = 5%

Growth rate in dividend= 5%

(b) Cost of Equity

$$K_e = \frac{D_1}{P_0} + g$$

$$K_e = \frac{16}{80} + 0.05$$

K_e = 25%

(c) Cost of Preference Shares

$$K_P = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_P = \frac{8 + \frac{(106 - 104)}{5}}{\frac{(106 + 104)}{2}}$$

K_P = 8.4/105

K_P = 8%

(d) Cost of Debt

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_d = \frac{12(1-0.4) + \frac{(120-95)}{10}}{\frac{(120+95)}{2}}$$

K_d = (7.2+2.5)/107.5 = 9.02%

K_d = 9.02%

Calculation of existing Weighted Average Cost of Capital (WACC)

Capital	Amount (Rs.)	Weights	Cost	WACC
Equity Share Capital	30,00,000	0.6	25%	15.00%
Preference Share Capital	10,00,000	0.2	8%	1.60%
Debenture	10,00,000	0.2	9.02%	1.80%
	50,00,000	**1**		**18.40%**

Alternative presentation

(i) Computation of existing WACC on book value weights

Source (1)	Book value (Rs) (2)	Weights (3)	Cost of capital (%) (4)	Product (2) x (4)
Equity Share Capital	30,00,000	0.60	25	7,50,000
Preference Share Capital	10,00,000	0.20	8	80,000
Debenture	10,00,000	0.20	9.02	90,200
Total	**50,00,000**	**1.00**		**9,20,200**

WACC = (Product / Total book value) x 100 = (9,20,200 /50,00,000) x 100 = **18.4%**

(ii) Cost of Long Term Debt = 15% (1-0.4) = 9%

$$\text{Revised } K_e = \frac{18}{72} + 0.05 = 30\%$$

Calculation of WACC after expansion taking book value weights

Capital	Amount (Rs.)	Weights	Cost	WACC
Equity Share Capital	30,00,000	0.3750	30%	11.25%
Preference Share Capital	10,00,000	0.1250	8%	1.00%
Debenture	10,00,000	0.1250	9.02%	1.13%
Long Term Debt	30,00,000	0.3750	9.00%	3.38%
	80,00,000	**1.0000**		**16.76%**

Alternative presentation

(i) Computation of WACC on book value weights after expansion

Source	Book value (Rs)	Weights	Cost of capital (%)	Product

(1)	(2)	(3)	(4)	(2) x (4)
Equity Share Capital	30,00,000	0.375	30	9,00,000
Preference Share Capital	10,00,000	0.125	8	80,000
Debenture	10,00,000	0.125	9.02	90,200
Long Term Debt	30,00,000	0.375	9	2,70,000
	80,00,000	**1.00**		**13,40,200**

WACC = (Product / Total book value) x 100 = (13,40,200 / 80,00,000) x 100 **= 16.76%**

QUESTION 20 : PAPER – NOV 2023

Z Ltd wishes to raise additional fund of Rs. 25,00,000 for meeting its investment plan. It has Rs. 5,25,000 in the form of retained earnings available for investment purposes. Further details are as following :

Combination of debt and equity	2:3
Cost of debt	
Upto Rs. 2,50,000	8% (before tax)
Above Rs. 2,50,000 and to upto Rs. 5,00,000	10%(before tax)
Beyond Rs. 5,00,000	12% (after tax)
Earnings of company	Rs. 50,00,000
Retention Ratio	40%
Expected growth of dividend	15%
Market price per share	Rs. 500
Number of outstanding equity shares	1,00,000
Tax rate	30%

You are required to calculate:

i. Cost of debt
ii. Cost of retained earnings and cost of equity
iii. Weighted average cost of capital

SOLUTION :

Equity 60% of Rs. 25,00,000 = Rs. 15,00,000
Debt 40% of Rs. 25,00,000 = Rs. 10,00,000

The capital structure after raising additional finance.

Shareholders' Funds		**Rs.**
Equity Capital	(Rs. 15,00,000 – Rs. 5,25,000)	9,75,000
Retained earnings		5,25,000
Debt (Interest at 8 % p.a.)		2,50,000
(Interest at 10 % p.a.)	(Rs. 5,00,000 – Rs.2,50,000)	2,50,000
(Interest at 12 % p.a.)	(Rs. 10,00,000 – Rs. 5,00,000)	5,00,000
Total Funds		25,00,000

(i) Determination of post-tax average cost of additional debt :

$K_d = 1 (1 – t)$

Where ,
I = Interest Rate
t = tax rate
On Rs. 2,50,000 = 8% (1 – 0.3) =5.6% or 0.056
On Rs. 2,50,000 = 10% (1 – 0.3) = 7% or 0.07
On Rs. 50,00,000 = 12% or 0.12

Average cost of debt

$$= \frac{(2{,}50{,}000 \times 0.056)+(2{,}25{,}000 \times 0.07)+(5{,}00{,}000 \times 0.12)}{10{,}00{,}000} \times 100 = 9.15\%$$

(ii) Determination of cost of retained earnings and cost of equity by applying Dividend growth model :

$$K_e \text{ or } K_f = \frac{D_1}{P_0} + g = \frac{D_0 (1+g)}{P_0} + g$$

Where ,
D_0 = Dividend paid = 60% of EPS = 60% × 50 = 30
G = Growth rate = 15 %
P_0 = current market price per share = 500
So, **K_e or K_r** = $\frac{30(1+0.15)}{500} + 0.15$ = 0.069 + 0.15 =21.9%

Computation of overall weighted average after tac cost of additional finance :

Particulars	Rs.	Weights	Cost Of funds	Weighted Cost(%)
Equity (including retained earnings)	15,00,000	0.60	21.9%	13.14
Debt	10,00,000	0.40	9.15%	3.66
WASS	**25,00,000**			**16.80**

WACC = (Product / Total book value) × 100 = (4,20,000 / 25,00,000) × 100 = 16.8%

Alternative Solution for 4 (ii) and 4(iii)

If we assume expected growth rate of dividend as 5% .

i. Determination of cost of retained earnings and cost of equity by applying Dividend growth model :

$$K_e \text{ or } K_f = \frac{D_1}{P_0} + g = \frac{D_0 (1+g)}{P_0} + g$$

Where,
D_0 = Dividend paid = 60% of EPS = 60% × 50 = 30
G = Growth rate = 5%
P_0 = current market price per share = Rs. 500
So, **K_e or K_r** = $\frac{30(1+0.05)}{500} + 0.05$ = 0.063 + 0.05 = 11.3%

ii. Computation of overall weighted average after tac cost of additional finance :

Particulars	Rs.	Weights	Cost Of funds	Weighted Cost(%)

Equity (including retained earnings)	15,00,000	0.60	11.3%	6.78
Debt	10,00,000	0.40	9.15%	3.66
WASS	**25,00,000**			**10.44**

WACC = (Product / Total book value) × 100 = (2,61,000 / 25,00,000) × 100
=**10.44%**

QUESTION 21 : RTP – MAY 2024

Totto Ltd. has following capital structure as on 31st December 2023, which is considered to be optimum:

	Rs.
12% Debenture	4,50,000
10% Preference share capital	1,50,000
Equity shares capital (2,00,000 shares)	24,00,000

The company's share has a current market price of Rs. 30.25 per share. The expected dividend per share in next year is 50 percent of the 2023 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue:

Year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2022**	**2021**	**2022**	**2023**
EPS (Rs)	1.180	1.311	1.456	1.616	1.794	1.99	2.209	2.452	2.723	3.023

The company can issue 14 percent new debenture and 12 percent new preference share. The company's debenture is currently selling at Rs. 99.

The new preference issue can be sold at a net price of Rs. 9.90, paying a dividend of Rs.1.25 per share. The company's marginal tax rate is 50%.

(i) CALCULATE the after - tax cost (a) of new debts and new preference share capital, (b) of ordinary equity, assuming new equity comes from retained earnings.

(ii) CALCULATE the marginal cost of capital for the new funds raised.

(iii) How much can be spent for capital investment before new ordinary share must be sold? Marginal cost of capital remains to be constant. (Assuming that retained earnings available for next year's investment is 50% of 2023 earnings.)

(iv) What will be marginal cost of capital (cost of fund raised in excess of the amount calculated in part (iii) if the company can sell new ordinary shares of Rs.22 per share? Assuming both the cost of debt and of preference share capital to be constant.

SOLUTION :

(i) Calculation of after-tax cost of the followings:

(a) $\text{New 14\% Debenture } (K_d) = \frac{I(1-t)}{NP} = \frac{\text{Rs. } 14\ (1-0.5)}{Rs.99}$

= 0.0707 or 7.07%

$$\text{New 12\% Preference Shares } (K_p) = \frac{PD}{NP} = \frac{\text{Rs. } 1.25}{Rs.9.90}$$

$$= 0.1263 \text{ or } 12.63\%$$

Where,
I = Interest
t = Tax rate
PD = Preference dividend
NP = Net proceeds

(b) Equity Shares (Retained Earnings) (K_e)

$$= \frac{Expected \text{ Dividend } (D_1)}{Current \text{ Marketprice } (P_0)} + \text{Growth Rate (G)}$$

$$= \frac{50\% \text{ of Rs. } 3.023}{Rs. \ 30.25} + 0.11^* = 0.16 \text{ or } 16\%$$

* Growth rate (on the basis of EPS) is calculated as below:

$$= \frac{\text{EPS in current year - EPS inprevious year}}{\text{EPS in previous year}} = \frac{Rs. \ 3.023 - \text{Rs. } 2.723}{Rs. \ 2.723} = 0.11$$

(Students may verify the growth trend by applying the above formula to last three or four years. Growth Rate is rounded off)

(ii) Calculation of marginal cost of capital (on the basis of existing capital structure):

Source of capital	Weight (a)	After tax Cost of capital (%) (b)	WACC (%) (a) × (b)
14% Debenture	0.15	7.07	1.0605
12% Preference shares	0.05	12.63	0.6315
Equity shares	0.80	16.00	12.800
Marginal cost of capital			14.492

(iii) The company can spend for capital investment before issuing new equity shares and without increasing its marginal cost of capital:
Retained earnings can be available for capital investment
= 50% of 2023 EPS × equity shares outstanding
= 50% of Rs. 3.023 × 2,00,000 shares = Rs.3,02,300
Since, marginal cost of capital is to be maintained at the current level i.e. 14.492%, the retained earnings should be equal to 80% of total additional capital for investment.

Thus, investment before issuing equity $\left(\frac{Rs. \ 3,02,300}{80} \text{ X } 100\right)$ = Rs. 3,77,875

The remaining capital of Rs. 75,575 i.e. Rs. 3,77,875– Rs. 3,02,300 shall be financed by issuing 14% Debenture and 12% preference shares in the ratio of 3 : 1 respectively.

(iv) If the company spends more than Rs.3,77,875 as calculated in part (iii) above, it will have to issue new shares at Rs. 22 per share.

The cost of new issue of equity shares will be:

$$K_e = \frac{\text{Expected dividend } (D_1)}{\text{Current market price } (P_0)} + \text{Growth rate(g)} = \frac{50\% \text{ of Rs. } 3.023}{Rs.\ 22} + 0.11$$

= 0.1787 or 17.87%

Calculation of marginal cost of capital (assuming the existing capital structure will be maintained):

Source of capital	**Weight** **(a)**	**Cost (%)** **(b)**	**WACC (%)** **(a) × (b)**
14% Debenture	0.15	7.07	1.0605
12% Preference shares	0.05	12.63	0.6315
Equity shares	0.80	16.00	12.800
Marginal cost of capital			14.492

QUESTION 22 : PAPER – MAY 2024

The capital structure of Shine Ltd. as on 31.03.2024 is as under :

Particulars	**Amount (Rs.)**
Equity share capital of Rs.10 each	45,00,000
15% Preference share capital of Rs.100 each	36,00,000
Retained earnings	32,00,000
13% Convertible Debenture of Rs.100 each	67,00,000
11% Term Loan	20,00,000
Total	**2,00,00,000**

Additional information :

(a) Company issued 13% Convertible Debentures of Rs.100 each on 01.04.2023 with a maturity period of 6 years. At maturity, the debenture holders will have an option to convert the debentures into equity shares of the company in the ratio of 1 : 4 (4 shares for each debenture). The market price of the equity shares is Rs.25 each as on 31.03.2024 and the growth rate of the share is 6% per annum.

(b) Preference stock, redeemable after eight years, is currently selling at Rs.150 per shares.

(c) The prevailing default- risk free interest rate on 10-year GOI treasury bonds is 6%. The average market risk premium is 8% and the Beta (β) of the company is 1.54.

Corporate tax rate is 25% and rate of personal income tax is 20%.

You are required to calculate the cost of :

(i) Equity Share Capital

(ii) Preference Share Capital
(iii) Convertible Debenture
(iv) Retained Earnings
(v) Term Loan

Thanks ….

CHAPTER

6 FINANCING DECISIONS – CAPITAL STRUCTURE

QUESTION 1 : MTP – MAR 2018; OCT – 2018,2021 / RTP – NOV 2019 / PYP – NOV 2020

Sophisticated Limited is considering three financing plans. The key information is as follows:

(a) Total investment amount to be raised Rs.4,00,000

(b) Plans of Financing Proportion:

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c) Cost of debt 10%

Cost of preference shares 10%

(d) Tax rate 30%

(e) Equity shares of the face value of Rs.10 each will be issued at a premium of Rs.10 per share.

(f) Expected EBIT is Rs.10,00,000.

You are required to DETERMINE for each plan: -

(i) Earnings per share (EPS)

(ii) The financial break-even point.

(iii) Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.

SOLUTION :

(i) Computation of Earnings per share (EPS)

Plans	A	B	C
Earnings before interest and tax (EBIT)	10,00,000	10,00,000	10,00,000
Less: Interest charges	---	(20,000) (10% × Rs.2 lakh)	---

Earnings before tax (EBT)	10,00,000	9,80,000	10,00,000
Less: Tax (@ 30%)	(3,00,000)	(2,94,000)	(3,00,000)
Earnings after tax (EAT)	7,00,000	6,86,000	7,00,000
Less: Preference Dividend	---	---	(20000) (10% × Rs.2 lakh)
Earnings available for Equity shareholders (A)	7,00,000	6,86,000	6,80,000
No. of Equity shares (B)	20,000 (Rs.4 lakh ÷ Rs.20)	10,000 (Rs.2 lakh ÷ Rs.20)	10,000 (Rs.2 lakh ÷ Rs.20)
EPS Rs. [(A) ÷ (B)]	35	68.6	68

(ii) Calculation of Financial Break-even point

Financial break-even point is the earnings which are equal to the fixed finance charges and preference dividend.

Plan A: Under this, plan there is no interest or preference dividend payment. Hence, the Financial Break-even point will be zero.

Plan B: Under this plan, there is an interest payment of Rs.20,000 and no preference dividend.

Hence, the Financial Break-even point will be Rs.20,000 (Interest charges).

Plan C: Under this plan, there is no interest payment but an after tax preference dividend of Rs.20,000 is paid. Hence, the Financial Break- even point will be before tax earnings of Rs.28,571 (i.e. Rs.20,000 ÷ 0.7)

(iii) Computation of indifference point between the plans.

The indifference between two alternative methods of financing is calculated by applying the following formula.

$$= \frac{(EBIT - l1)\,(1 - T)}{E_1} = \frac{(EBIT - 12)(1 - T)}{E_2}$$

EBIT = Earnings before interest and tax.

l1 = Fixed charges (interest or pref. dividend) under Alternative 1

l2 = Fixed charges (interest or pref. dividend) under Alternative 2

T = Tax rate

E1 = No. of equity shares in Alternative 1

E2 = No. of equity shares in Alternative 2

Now, we can calculate indifference point between different plans of financing.

(a) Indifference point where EBIT of Plan A and Plan B is equal.

$$\frac{(EBIT - 0)\,(1 - 0.3)}{20,000} = \frac{(EBIT - 20,000)(1 - 0.3)}{10,000}$$

0.7 EBIT (10,000) = (0.7 EBIT – 14,000) (20,000)

7,000 EBIT = 14,000 EBIT – 28 crores

EBIT = 40,000

(b) Indifference point where EBIT of Plan A and Plan C is equal

$$\frac{(EBIT - 0)(1 - 0.3)}{20,000} = \frac{(EBIT - 20,000)(1 - 0.3)}{10,000}$$

0.7 EBIT (10,000) = (0.7 EBIT – 20,000) (20,000)

7000 EBIT = 14,000 EBIT – 40 crores

EBIT = 57,142.86

(c) Indifference point where EBIT of Plan B and Plan C are equal

$$\frac{(EBIT - 20,000)(1 - 0.3)}{10,000} = \frac{(EBIT - 0)(1 - 0.3) - 20,000}{10,000}$$

(0.7 EBIT – 14,000) (10,000) = (0.7 EBIT – 20,000) (10,000)

7,000 EBIT – 14 crore = 7,000 EBIT - 20 crore

There is no indifference point between the financial plans B and C.

QUESTION 2 : PYP - MAY 2018

Sun Ltd is considering two financing plans

Details of which are as under

1. Fund Requirement – Rs 100 lakhs
2. Financial Plans

Plan	Equity	Debt
I	100%	-
II	25%	75%

3. Cost of Debt – 12%
4. Tax Rate – 30%
5. Equity share of Rs 10 each, issued at a premium of Rs 15 per share
6. Expected Earnings before interest and taxes (EBIT) Rs 40 lakhs

You are required to compute

1. EPS in each of the plan
2. The Financial Break Even Point
3. Indifference point between Plan I and Plan II

SOLUTION :

(i) Computation of Earnings Per Share (EPS)

Plans	I (Rs.)	II (Rs.)
Earnings before interest & tax (EBIT)	40,00,000	40,00,000
Less: Interest charges (12% of Rs.75 lakh)	--	-9,00,000
Earnings before tax (EBT)	40,00,000	31,00,000
Less: Tax @ 30%	(12,00,000)	(9,30,000)
Earnings after tax (EAT)	28,00,000	21,70,000
No. of equity shares (@ Rs.10+Rs.15)	4,00,000	1,00,000
E.P.S (Rs.)	7.00	21.70

(ii) Computation of Financial Break-even Points

Plan 'I' = 0 – Under this plan there is no interest payment, hence the financial break- even point will be zero.

Plan 'II' = Rs. 9,00,000 - Under this plan there is an interest payment of Rs.9,00,000, hence the financial break -even point will be Rs.9 lakhs

(iii) Computation of Indifference Point between Plan I and Plan II:

Indifference point is a point where EBIT of Plan-I and Plan-II are equal. This can be calculated by applying the following formula:

{(EBIT – I1) (1 – T)} / E1 = {(EBIT – I2) (1 – T)} / E2

So = $\frac{EBIT(1-03)}{4,00,000 \text{ Shares}} = \frac{(EBIT - Rs.9,00,000)(1-0.3)}{1,00,000 \text{ Shares}}$

Or, 2.8 EBIT – 25,20,000 = 0.7EBIT or, 2.1EBIT = 25,20,000

EBIT = 12,00,000

QUESTION 3 : PYP – NOV 2018 / MTP – OCT 2020

Sinha Steel Ltd. requires Rs. 30,00,000 for a new plant which expects to yield earnings before interest and taxes of Rs. 5,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per share. It has three alternatives to finance the project as follows -

Alternative	Debt	Equity Shares
1	Rs.2,50,000	balance
2	Rs.10,00,000	balance
3	Rs.15,00,000	balance

The company's share is currently selling at Rs.200, but is expected to decline to Rs.160 in case the funds are borrowed in excess of Rs.10,00,000.

Slab wise interest rate for fund borrowed are as follows -

Fund Limit	Applicable Interest rate
up-to Rs.2,50,000	10%
over Rs.2,50,000 and up-to Rs.10,00,000	15%
over Rs.10,00,000	20%

The tax rate applicable to the company is 50 percent.

ANALYSE which form of financing should the company choose?

SOLUTION :

Alternative I = Raising Debt of Rs.2.5 lakh + Equity of Rs.27.5 lakh. Alternative II = Raising Debt of Rs.10 lakh + Equity of Rs.20 lakh. Alternative III = Raising Debt of Rs.15 lakh + Equity of Rs.15 lakh.

Calculation of Earnings per share (EPS):

(Amount in Rs.)

Particulars	FINANCIAL ALTERNATIVES

	Alternative I	Alternative II	Alternative III
Expected EBIT	5,00,000	5,00,000	5,00,000
Less: Interest (working note I)	(25,000)	(1,37,500)	(2,37,500)
Earnings before taxes	4,75,000	3,62,500	2,62,500
Less: Taxes @ 50%	(2,37,500)	(1,81,250)	(1,31,250)
Earnings after taxes (EAT)	2,37,500	1,81,250	1,31,250
Number of shares (working note ii)	13,750	10,000	9,375
Earnings per share (EPS)	**17.27**	**18.125**	**14**

Financing Alternative II (i.e. Raising debt of Rs.10 lakh and issue of equity share capital of Rs.20 lakh) is the option which maximizes the earnings per share.

Working Notes:

(i) Calculation of interest on Debt (Amount in Rs.)

Alternative I	(2,50,000 × 10%)		25,000
Alternative II	(2,50,000 × 10%)	25,000	
	(7,50,000 × 15%)	1,12,500	1,37,500
Alternative III	(2,50,000 × 10%)	25,000	
	(7,50,000 × 15%)	1,12,500	
	(5,00,000 × 20%)	1,00,000	2,37,500

(ii) Number of equity shares to be issued

Alternative I = Rs.27,50,000/ Rs.Rs.200 (Market Price of share)
= 13,750 shares
Alternative II = Rs.20,00,000/ Rs.200= 10,000 shares
Alternative III = Rs.15,00,000/ Rs. 160 = 9,375 shares

QUESTION 4 : PYP - MAY 2019 / MTP – MAY 2019

RM Steels Limited requires Rs. 10,00,000 for construction of a new plant. It is considering three financial plans :

(i) The company may issue 1,00,000 ordinary shares at Rs. 10 per share

(ii) The company may issue 50,000 ordinary shares at Rs. 10 per share and 5000 debentures of Rs. 100 denominations bearing a 8 per cent rate of interest and

(iii) The company may issue 50,000 ordinary shares at Rs. 10 per share and 5,000 preference shares at Rs. 100 per share bearing a 8 per cent rate of dividend.

(iv) If RM Steels Limited's earnings before interest and taxes are Rs. 20,000; Rs. 40,000; Rs. 80,000; Rs. 1,20,000 and Rs. 2,00,000, you are required to compute the earnings per share under each of the three financial plans?

(v) Which alternative would you recommend for RM Steels and Why? Tax rate is 50%.

SOLUTION :

(i) Computation of EPS under three – financial plans

Plan I : Equity Financing

	Rs	Rs	Rs	Rs	Rs

EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000
PAT	10,000	20,000	40,000	60,000	1,00,000
No. of equity shares	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
EPS	0.10	0.20	0.40	0.60	1

Plan II : Debt – Equity Mix

	Rs	**Rs**	**Rs**	**Rs**	**Rs**
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Interest	40,000	40,000	40,000	40,000	40,000
EBT	(20,000)	0	40,000	80,000	1,60,000
Less Tax @ 50%	10,000*	0	20,000	40,000	80,000
PAT	(10,000)	0	20,000	40,000	80,000
No. of equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(Rs. 0.20)	0	0.40	0.80	1.60

*The Company can set off losses against the overall business profit or may carry forward it to next financial years.

Plan III : Preference Shares – Equity Mix

	Rs	**Rs**	**Rs**	**Rs**	**Rs**
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000
PAT	10,000	20,000	40,000	60,000	1,00,000
Less : Pref. Dividend	40,000*	40,000*	40,000	40,000	40,000
PAT after Pref. dividend	(30,000)	(20,000)	0	20,000	60,000
No. of equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(0.60)	(0.40)	0	0.40	1.20

* In case of cumulative preference shares, the company has to pay cumulative dividend to preference shareholders, when company earns sufficient profits.

(ii) From the above EPS computations tables under the three financial plans we can see that when EBIT is Rs. 80,000 or more, Plan II : Debt-Equity mix is preferable over the Plan I & Plan III, as rate of EPS is more under this plan. On the other hand on EBIT of less than Rs. 80,000, Plan I : Equity Financing has higher EPS than Plan II and Plan III. Plan III Preference Share Equity mix is not acceptable at any level of EBIT, as EPS under this plan is lower.
The choice of the financing plan will depend on the performance of the company and other macro economic conditions. If the company is expected to have higher operating profit

plan II. Debt – Equity Mix is preferable. Moreover, debt financing gives more benefit due to availability of tax shield.

QUESTION 5 : RTP – MAY 2020 / MTP – MAR 2021

HN Limited is considering total investment of Rs. 20 lakhs. You are required to CALCULATE the level of earnings before interest and tax (EBIT) at which the EPS indifference point between the following financing
alternatives will occur:

(i) Equity share capital of Rs. 12,00,000 and 14% debentures of Rs. 8,00,000.

Or

(ii) Equity share capital of Rs. 8,00,000, 16% preference share capital of Rs. 4,00,000 and 14% debentures of Rs. 8,00,000.

Assume the corporate tax rate is 30% and par value of equity share is Rs.10 in each case.

SOLUTION :

Computation of level of earnings before interest and tax (EBIT)

In case alternative (i) is accepted, then the EPS of the firm would be:

$$EPS_{Alternatives(i)} = \frac{(EBIT - Interest)\,(1 - Tax\ Rate)}{No.\ of\ equity\ shares} = \frac{(EBIT - 0.14\times 8,00,000)\,(1 - 0.3)}{1,20,000\ shares}$$

In case the alternative (ii) is accepted, then the EPS of the firm would be

$$EPS_{Alternatives(ii)} = \frac{(EBIT - Interest)\,(1 - Tax\ Rate) - PD}{No.\ of\ equity\ shares} =$$

$$\frac{(EBIT - 0.14\times 8,00,000)\,(1 - 0.3) - 0.16\times 4,00,000}{80,000\ shares}$$

In order to determine the indifference level of EBIT, the EPS under the two alternative plans should be equated as follows:

$$\frac{(EBIT - 0.14\times 8,00,000)\,(1 - 0.3)}{1,20,000\ shares} = \frac{(EBIT - 0.14\times 8,00,000)\,(1 - 0.3) - 0.16\times 4,00,000}{80,000\ shares}$$

Or	1.40 EBIT – Rs. 1,56,800	=	2.10 EBIT - Rs. 4,27,200
Or	0.70 EBIT	=	Rs. 2,70,400
Or	EBIT	=	2,70,400 / 0.7
Or	EBIT	=	Rs. 3,86,285.71 (approx.)

QUESTION 6 : PAPER - DEC 2021

Earnings before interest and tax of a company are Rs. 4,50,000. Currently the company has 80,000 Equity shares of Rs. 10 each, retained earnings of Rs. 12,00,000. It pays annual interest of Rs. 1,20,000 on 12% debentures. The company proposes to take up an expansion scheme for which it needs additional fund of Rs. 6,00,000. It is anticipated that after expansion, the company will be able to achieve the same return on investment as at present.

It can raise fund either through debts at rate of 12% p.a. or by issuing Equity shares at par. Tax rate is 40%.

Required :

Compute the earnings per share if:

(i) The additional funds were raised through debts

(ii) The additional funds were raised by issue of Equity shares.

Advice whether the company should go for expansion plan and which sources of finance should be preferred.

SOLUTION :

Working Notes:

1. Capital employed before expansion plan:

	Rs.
Equity Shares (Rs. 10 x 80,000 shares)	8,00,000
Debentures {(Rs. 1,20,000 / 12) x 100}	10,00,000
Retained earnings	12,00,000
Total capital employed	30,00,000

2. Earnings before interest and tax (EBIT) = 4,50,000

3. Return on Capital Employed (ROCE) :

$$ROCE = \frac{EBIT}{Capital\ \text{employed}} \text{ x } 100 = \frac{Rs.\ 4{,}50{,}000}{Rs.\ 30{,}00{,}000} \text{ x } 100 = 15\%$$

4. Earnings before interest and tax (EBIT) after expansion scheme :

After expansion, capital employed = Rs. 30,00,000 + Rs. 6,00,000 = Rs. 36,00,000

Desired EBIT = 15% x Rs. 36,00,000 = Rs. 5,40,000

(i) & (ii) Computation of Earnings Per Share (EPS) under the following options:

	Present Situation	Expansion Scheme Additional funds raised as	
		Debt (i)	Equity (i)
	(Rs)	(Rs)	(Rs)
Earnings before Interest and Tax (EBIT)	4,50,000	5,40,000	5,40,000
Less: Interest - Old Debt - New Debt	1,20,000 --	1,20,000 72,000 (Rs. 6,00,000 x 12%)	1,20,000 --
Earnings before Tax (EBT)	3,30,000	3,48,000	4,20,000
Less: Tax (40% of EBT)	1,32,000	1,39,200	1,68,000
PAT/EAT	1,98,000	2,08,800	2,52,000
No. of shares outstanding	80,000	80,000	1,40,000
Earnings per Share (EPS)	2.475 $\left(\frac{Rs.1{,}98{,}000}{80{,}000}\right)$	2.610 $\left(\frac{Rs.2{,}08{,}000}{80{,}000}\right)$	1.800 $\left(\frac{Rs.2{,}52{,}000}{1{,}40{,}000}\right)$

Advise to the Company: When the expansion scheme is financed by additional debt, the EPS is higher. Hence, the company **should finance the expansion** scheme by **raising debt**

QUESTION 7 : RTP – NOV 2022

ABC Limited provides you the following information:

	Rs.
Profit (EBIT)	2,80,000
Less: Intt. on Debt @10%	40,000
EBT	2,40,000
Less: Income Tax @ 50%	1,20,000
	1,20,000
No. of Equity Shares (Rs. 10 each)	30,000
Earnings per share (EPS)	4
Price / EPS (P/E) Ratio	10
Ruling Market price per share	40

The company has undistributed reserves of Rs. 7,00,000 and needs Rs. 4,00,000 further for expansion. This investment is expected to earn the same rate as funds already invested. You are informed that a debt equity (debt/ debt +equity) ratio higher than 32% will push the P/E ratio down to 8 and raise the interest rate on additional borrowings (debentures) to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional funds are raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price of Rs. 40 per share.

SOLUTION :

Ascertainment of probable price of shares

Particulars	**Plan (i) (If Rs. 4,00,000 is raised as debt) (Rs.)**	**Plan (ii) (If Rs. 4,00,000 is raised by issuing equity shares) (Rs.)**
Earnings Before Interest (EBIT) 20% on (14,00,000 + 4,00,000)	3,60,000	3,60,000
Less: Interest on old debentures @ 10% on4,00,000	40,000	40,000
	3,20,000	3,20,000
Less: Interest on New debt @ 12% on Rs. 4,00,000	48,000	-
Earnings Before Tax (After interest)	2,72,000	3,20,000
Less: Tax @ 50%	1,36,000	1,60,000
Earnings for equity shareholders (EAIT)	1,36,000	1,60,000
Number of Equity Shares (in numbers)	30,000	40,000
Earnings per Share (EPS)	4.53	4
Price/ Earnings Ratio	8	10
Probable Price Per Share	36.24 (8 x 4.53)	40 (10 x 4)

Working Notes :

		Rs.
1.	Calculation of Present Rate of Earnings	
	Equity Share capital (30,000 x Rs. 10)	3,00,000
	10% Debentures $\left[40,000 \times \frac{100}{10}\right]$	4,00,000
	Reserves (given)	7,00,000
		14,00,000
	Earnings before interest and tax (EBIT) given	2,80,000
	Rate of Present Earnings = $\left[\frac{2,80,000}{14,00,000} \times 100\right]$	20%
2.	Number of Equity Shares to be issued in Plan $\left[\frac{4,80,000}{40}\right]$	10,000
	Thus, after the issue total number of shares	30,000 + 10,000 = 40,000
3.	Debt/Equity Ratio if Rs. 4,00,000 is raised as debt:	$\left[\frac{8,00,000}{18,00,000} \times 100\right]$ = 44.44%

As the debt equity ratio is more than 32% the P/E ratio shall be 8 in plan (i)

QUESTION 8 : PAPER - MAY 2023

The following information pertains to CIZA Ltd:

Capital Structure	Rs.
Equity Share capital (Rs. 10 each)	8,00,000
Retained earnings	20,00,000
9% Preference Share capital (Rs. 100 each)	12,00,000
12% long term loan	10,00,000
Interest coverage ratio	8
Income tax rate	30%
Price – earnings ratio	25

The company is proposed to take up an expansion plan, which requires an additional investment of Rs. 34,50,000. Due to this proposed expansion, earnings before interest and taxed of the company will increase by Rs. 6,15,000 per annum. The additional fund can be raised in following manner:

- By issue of equity shares at present market price or
- By borrowing 16% Long-term loans from bank

You are informed that Debt equity ratio (Debt/shareholder's fund) in the range of 50% to 80% will bring down the price-earnings ratio to 22 whereas, Debt-equity ratio over 80% will bring down the price-earnings ratio to 18%.

Required:

Advice which option is most suitable to raise additional capital so that the Market Price per Share (MPS) is maximised.

SOLUTION :

Working notes:

(i) Interest Coverage ratio = 8

$$\frac{\text{EBIT}}{Interest} = 8$$

$$\frac{EBIT}{1,20,000} = 8$$

So, EBIT = Rs. 9,60,000

(ii) Proposed Earnings Before Interest & Tax = 9,60,000 + 6,15,000 = Rs. 15,75,000

Option 1: Equity option

Debt = Rs. 10,00,000

Shareholders Fund = 8,00,000+20,00,000+12,00,000+34,50,000 = Rs. 74,50,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{10,00,000}{74,50,000} = 13.42\%$

P/E ratio in this case will be 25 times

Option 2: Debt option

Debt = 10,00,000+34,50,000 = Rs. 44,50,000

Shareholders Fund = 8,00,000+20,00,000+12,00,000 = Rs. 40,00,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{44,50,000}{40,00,000} = 111.25\%$

Debt equity ratio has crossed the limit of 80% hence PE ratio in this case will remain at 18 times.

Number of Equity Shares to be issued = Rs. 34,50,000/ Rs. 150 = 23,000

(iii) Calculation of Earnings per Share and Market Price per share

Particulars	**Rs.**
Current Earnings Before Interest & Tax	9,60,000
Less: Interest	1,20,000
Earnings Before Tax	8,40,000
Less: Taxes	2,52,000
Earnings After Tax	5,88,000
Less: Preference Dividend (@9%)	1,08,000
Net earnings for Equity shareholders	4,80,000
Number of equity shares	80,000
Earnings Per Share	**6**
Price-earnings ratio	25
Market Price per share	**150**

Calculation of EPS and MPS under two financial options

Particulars	Financial Options	
	Option I Equity Shares Issued (Rs.)	Option II 16% Long Term Debt Raised (Rs.)
Earnings before interest and Tax (EBIT)	15,75,000	15,75,000
Less: Interest on old debentures @ 12%	1,20,000	1,20,000
Less: Interest on additional loan (new) @ 16% on ` 34,50,000	NIL	5,52,000
Earnings before tax	14,55,000	9,03,000
Less: Taxes @ 30%	4,36,500	2,70,900
(EAT/Profit after tax)	**10,18,500**	**6,32,100**
Less: Preference Dividend (@9%)	1,08,100	1,08,100
Net Earnings available to Equity shareholders	**9,10,500**	**5,24,100**
Number of Equity Shares	1,03,000	80,000
Earnings per Share (EPS)	**8.84**	**6.55**
Price/ Earnings ratio	25	18
Market price per share (MPS)	**221**	**117.9**

Advise: Equity option has higher Market Price per Share therefore company should raise additional fund through equity option.

QUESTION 9 : PAPER - NOV 2023

The data of K Textile Ltd are given as follows

Particulars	Amount (Rs)
Profit Before Interest and Tax	50,00,000
Less : Interest on debentures @10%	10,00,000
Profit before tax	40,00,000
Less: Income tax @50%	20,00,000
Profit after tax	20,00,000
No. of equity shares (Rs. 10 each)	10,00,000
EPS	2
PE Ratio	10
Market price per share	20

The company is planning to start a new project needs to be having a total capital outlay of Rs.40,00,000. You are informed that a debt equity ratio $\left[\frac{D}{D+E}\right]$ higher than 36% pushes the K_e (cost of equity) upto 12.5% means reducing the PE ratio to 8 and rises the interest rate in additional amount borrowed to 12%. Retained earnings of the company is Rs. 1.4 crores.

Find out the probable price of share if :

- The additional funds are raised as a loan
- The amount is raised by issuing equity shares

SOLUTION :

In this question , EBIT after proposed extension is not given. Therefore, we can assume that existing return on capital employed will be maintained.

Working Notes :

1. Return on Capital Employed = $\frac{EBIT}{Capital\ employed} = \frac{50,00,000}{3,40,00,000} = 14.70\%$

   Capital Employed = Debt + Equity
   = 1,00,00,000 + (1,00,00,000 + 1,40,00,000)
   = 3,40,00,000

2. Proposed EBIT = Proposed Capital Employed × return on Capital Employed
   = (3,40,00,000 + 40,00,000) × 14.70% = 55,86,000

3. Debt Equity Ratio = $\frac{Debt}{Debt+Equity}$

Option 1: loan option :

Debt = 1,00,00,000 + 40,00,000 = 1,40,00,000
Equity = 2,40,00,000

Debt Equity Ratio = $\frac{1.4\ Cr}{1.4Cr+\ 2.40Cr} = 36.84\%$

Debt Equity Ratio has crossed the limited of 36 % hence, PE ratio in this case will be 8 times and additional borrowing will be at the rate of 12%.

Option 2 : Equity option :

Debt = 1,00,00,000
Equity =2,40,00,000 + 40,00,000 = 2,80,00,000

Debt Equity Ratio = $\frac{1\ Cr}{1Cr+2.8Cr} = 26.32\%$

Debt Equity Ratio has not crossed the limited of 36 % hence, PE ratio in this case will remain at 10 times.

4. Number of equity shares to be issued in case of equity option @ 20 per share
   = 40,00,000/20 = 2,00,000

Particulars	Financial Options	
	Option 1	Option 2
	12% additional Loan of 40,00,000	10,00,000 equity shares @ 10 and 2,00,000 equity shares@20
Profit before interest and tax (PBIT)	55,86,000	55,86,000

Less: Interest on old debentures @ 10%	10,00,000	10,00,000
Less: Interest on additional loan (new) @ 12% on 40,00,000	4,80,000	Nil
Profit before tax	41,06,000	45,86,000
Less: Taxes @ 50 Earnings for equity shareholders (EAT / Profit after tax)	20,53,000	22,93,000
Number of equity shares	10,00,000	12,00,000
Earning per shares (EPS)	2.05	1.91
Price/ Earnings Ratio	8	10
Market price per share (MPS)	16.42	19.11

Thanks ….

CHAPTER

7

CAPITAL STRUCTURE THEORIES

QUESTION 1 : RTP – MAY 2018

Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of Rs. 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of Rs. 30 lakhs. Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company.

Required:

CALCULATE the value of companies9 P and Q using (i) Net Income Approach and (ii) Net Operating Income Approach.

SOLUTION :

(i) Valuation under Net Income Approach

Particulars	**P**	**Q**
	Amount (Rs.)	**Amount (Rs.)**
Earnings before Interest & Tax (EBIT) (20% of Rs. 30,00,000)	6,00,000	6,00,000
Less: Interest (10% of Rs. 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100/15)
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

(ii) Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (Rs.)	Q Amount (Rs.)
Capitalization of earnings at 15% $\frac{Rs.6,00,000(1-0.5)}{0.15}$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 – 0.5)}	9,00,000	Nil
Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

QUESTION 2 : PAPER - MAR 2018

Stopgo Limited, an all equity financed company, is considering the repurchase of Rs 200 lakhs equity and to replace it with 15% debentures of the same amount. Current Market Value of the company is Rs 1140 lakhs and its cost of capital is 20%. Its earnings before interest and taxes (EBIT) are expected to remain constant in future. Its entire earnings are distributed as dividend. Applicable tax rate is 30%.

You are required to calculate the impact on the following on account of the change in the capital structure as per Modigliani and miller hypothesis.

1. The Market Value of the company
2. Its cost of Capital and
3. Its cost of Equity

SOLUTION :

(a) Working Note

$\frac{Net\ income\ (NI)\ for\ equity\ -\ holders}{K_e}$ = Market Value of Equity

$\frac{Net\ income\ (NI)\ for\ equity\ holders}{0.20}$ = = Rs. 1,140 lakhs

Therefore, Net Income to equity–holders = Rs. 228 lakhs

EBIT = Rs. 228 lakhs / 0.7 = Rs. 325.70 lakhs

	All Equity (Rs. In lakhs)	Debt of Equity (Rs. In lakhs)
EBIT	325.70	325.70
Interest on Rs.200 lakhs @ 15%	--	30.00
EBT	325.70	295.70
Tax @ 30 %	97.70	88.70
Income available to equity holders	228	207

(i) Market value of levered firm = Value of unlevered firm + Tax Advantage

= Rs. 1,140 lakhs + (Rs.200 lakhs x 0.3)

= Rs. 1,200 lakhs

The impact is that the market value of the company has increased by Rs. 60 lakhs (Rs. 1,200 lakhs – Rs. 1,140 lakhs)

Calculation of Cost of Equity

K_e = (Net Income to equity holders / Equity Value) X 100

= (207 lakhs / 1200 lakhs – 200 lakhs) X 100

= (207/ 1000) X 100

= 20.7 %

(ii) Cost of Capital

Components	Amount (Rs. In lakhs)	Cost of Capital %	Weight	WACC %
Equity	1000	20.7	83.33	17.25
Debt	200	(15% X 0.7) =10.5	16.67	1.75
	1200			19.00

The impact is that the WACC has fallen by 1% (20% - 19%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity is 20.7% [As calculated in point (i)]

The impact is that cost of equity has risen by 0.7% i.e. 20.7% - 20% due to the presence of financial risk.

Further, Cost of Capital and Cost of equity can also be calculated with the help of formulas as below, though there will be no change in final answers.

Cost of Capital (K_o) = $K_{eu}(1 – tL)$

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{Debt}{Debt + Equity}$$

$$K_0 = 0.2 \times \left(\frac{Rs.200lakh}{Rs.1,200lakh} \times 0.3 \right)$$

So, Cost of Capital = 0.19 or 19%

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d) \frac{Debt(1-t)}{Equity}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$K_e = 0.20 + \left(0.20 - 0.15 \times \frac{Rs.200lakh \times 0.7}{Rs.1,000lakh} \right)$$

K_e = 0.20 + 0.007 = 0.207 or 20.7%

So, Cost of Equity = 20.70%

QUESTION 3 : PAPER - NOV 2018

Following information relating to Jee Ltd. are given

Profit after tax	Rs 10,00,000
Dividend Payout Ratio	50%
Number of Equity Shares	50,000
Cost of Equity	10%
Rate of Return on Investment	12%

1. What would be the market value per share as per Walters Model?
2. What is the optimum dividend payout ratio according to Walter's model and Market Value of Equity share at that payout ratio?

SOLUTION :

(i) Walter's model is given by –

$$P = \frac{D + (E - D)(r / K_e)}{K_e}$$

Where,

P = Market price per share,

E = Earnings per share = Rs. 10,00,000 ÷ 50,000 = Rs. 20

D = Dividend per share = 50% of 20 = Rs. 10

r = Return earned on investment = 12%

K_e = Cost of equity capital = 10%

$$\therefore P = \frac{10 + (20 - 10) \times \frac{0.12}{0.10}}{0.10} = \frac{22}{0.10} = \text{Rs.220}$$

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is Nil. So, at a payout ratio of zero, the market value of the company's share will be:-

$$P = \frac{0 + (20 - 0) \times \frac{0.12}{0.10}}{0.10} = \frac{24}{0.10} = \text{Rs.240}$$

QUESTION 4 : PAPER - NOV 2018

The following data relate to two companies belonging to the same class

Particulars	**A Ltd**	**B Ltd.**
Expected Net operating Income	Rs 18,00,000	Rs 18,00,000
12% Debt	Rs 54,00,000	-
Equity capitalalization Rate	-	18 %

Required

a. Determine the total market value, Equity capitalization rate and weighted average cost of capital for each assuming no taxes as per M.M.Approach.

b. Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

SOLUTION :

(a) Assuming no tax as per MM Approach.

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (Vu) = [NOI/k_e] = 18,00,000/0.18 = Rs. 1,00,00,000

K_e of Unlevered Firm (given) = 0.18

K_o of Unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

Total Value of Levered Firm (V_L) = V_u + (Debt × Nil) = Rs.1,00,00,000 + (54,00,000 × nil)
= Rs.1,00,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

	Particulars	A Ltd.	B Ltd.
A.	Net Operating Income (NOI)	18,00,000	18,00,000
B.	Less: Interest on Debt (I)	6,48,000	-
C.	Earnings of Equity Shareholders (NI)	11,52,000	18,00,000
D.	Overall Capitalization Rate (ko)	0.18	0.18
E.	Total Value of Firm (V = NOI/ko)	1,00,00,000	1,00,00,000
F.	Less: Market Value of Debt	54,00,000	-
G.	Market Value of Equity (S)	46,00,000	1,00,00,000
H.	Equity Capitalization Rate [ke = NI /S]	0.2504	0.18
I.	Weighted Average Cost of Capital [WACC (k_o)]* $k_o = (k_e \times S/V) + (k_d \times D/V)$	0.18	0.18

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	46,00,000	0.46	0.2504	0.1152
Debt	54,00,000	0.54	0.12*	0.0648
Total	81,60,000			0.18

*K_d = 12% (since there is no tax)

WACC = 18%

(b) Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of unlevered Firm (Vu) = [NOI (1 – t)/k_e] = 18,00,000 (1 – 0.40)] / 0.18
= Rs.60,00,000

K_e of unlevered Firm (given) = 0.18

Ko of unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

Total Value of Levered Firm (V_L) = V_u + (Debt × Tax)
= Rs.60,00,000 + (54,00,000 × 0.4)

= Rs.81,60,000

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

= 18% (i.e. K_e = Ko)

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of a Ltd

Particulars	**A Ltd.**
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [ke = NI/S]	0.2504
Weighted Average Cost of Capital (k_o)* $k_o = (k_e \times S/V) + (k_d \times D/V)$	13.23

*Computation of WACC A Ltd

Component of Capital	**Amount**	**Weight**	**Cost of Capital**	**WACC**
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000			0.1323

*Kd = 12% (1 – 0.4) = 12% × 0.6 = 7.2%

WACC = 13.23%

QUESTION 5 : MTP – OCT 2019

A Ltd. and B Ltd. are identical in every respect except capital structure. A Ltd. does not employ debts in its capital structure whereas B Ltd. employs 12% Debentures amounting to Rs.100 lakhs. Assuming that:

(i) All assumptions of M-M model are met;

(ii) Income-tax rate is 30%;

(iii) EBIT is Rs. 25,00,000 and

(iv) The Equity capitalization rate of 8A' Ltd. is 20%.

CALCULATE the value of both the companies and also find out the Weighted Average Cost of Capital for both the companies.

SOLUTION :

i. Calculation of Value of'8A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'A Ltd' (Unlevered)

$$Vu = \frac{EBIT(1-t)}{k_e} = \frac{Rs.25,00,000(1 - 0.30)}{20\%} = \frac{Rs.17,50,000}{20\%} = Rs.\ 87,50,000$$

Market Value of 8B Ltd.9 (Levered)

Vg = Vu + TB

= Rs. 87,50,000 + (Rs.1,00,00,000 × 0.30)

= Rs. 87,50,000 + Rs.30,00,000 = Rs.1,17,50,000

ii. Computation of Weighted Average Cost of Capital (WACC)

WACC of 'A Ltd.' = 20% (i.e. Ke = Ko)

WACC of 'B Ltd.'

	B Ltd. (Rs.)
EBIT	25,00,000
Interest to Debt holders	(12,00,0000
EBT	13,00,000
Taxes @ 30%	(3,90,0000
Income available to Equity Shareholders	9,10,000
Total Value of Firm	1,17,50,000
Less: Market Value of Debt	(1,00,00,000)
Market Value of Equity	17,50,000
Return on equity (Ke) = 9,10,000 / 17,50,000	0.52

Computation of WACC B. Ltd

Component of Capital	**Amount**	**Weight**	**Cost of Capital**	**WACC**
Equity	17,50,000	0.149	0.52	0.0775
Debt	1,00,00,000	0.851	0.084*	0.0715
Total	1,17,50,000			0.149

*Kd = 12% (1 – 0.3) = 12% × 0.7 = 8.4%

WACC = 14.90%

QUESTION 6 : MTP – MAY 2020

A&R Ltd. is an all equity financed company with a market value of Rs. 25,000 lakhs and cost of equity (Ke) 18%. The company wants to buyback equity shares worth Rs. 5,000 lakhs by issuing and raising 10% debentures redeemable at 10% premium after 5 years. Rate of tax may be taken as 35%. Applying Modigliani-Miller (MM) (with taxes), you are required to CALCULATE after restructuring:

(i) Market value of A&R Ltd.

(ii) Cost of Equity (Ke)

(iii) Weighted average cost of capital (using market weights).

SOLUTION :

Value of a company (V) = Value of equity (S) + Value of debt (D)

A&R Ltd. is all equity financed company, its value would equal to value of equity

Market value of equity = $\frac{\text{Net Income}}{(\text{NI})\ K_E}$

In the question, market value of equity is Rs. 25,000 lakhs and cost of equity (Ke) is 18%. The Net Income
(NI) is calculated as follows:

$\frac{\text{Net Income(NI) for equity}}{\text{holders } K_E}$ = Market Value of Equity

= $\frac{\text{Net Income(NI) for equity}}{\text{holders } 0.8}$ = 25,000 lakh

holders 0.18

Net income for equity holders = 4,500 lakh

Net Income (NI) is after tax income, the before tax income would be

EBT = $\frac{45\ \text{Lakh}}{(1 - 0.35)}$ = 6,923.07 lakh

Since, A&R Ltd. is an all equity financed and there is no interest expense, so here EBT is equal to EBIT. After
issuing 10% debentures, the A&R Ltd would become a levered company.

(i) The value of A&R Ltd. after issuing debentures would be calculated as follows:

Value of a levered company (Vg)
= Value of an unlevered company (Vu) + Tax benefit (TB)
= Rs. 25,000 lakhs + (Rs. 5,000 lakhs × 35%)
= Rs. 25,000 + Rs. 1,750 = Rs. 26,750

(ii) Cost of Equity (Ke)

Total Value = Rs. 26,750 lakh
Less: Value of Debt = Rs. 5,000 lakh
Value of Equity = Rs. 21,750

Ke = $\frac{4.175\ \text{Lakh}}{21{,}750\ \text{Lakh}}$ = 0.1919 = 19.19%

(iii) WACC (on market value weight)

Components of Costs	Amount (lakh)	Cost of Capital (%)	Weight	WACC (%)
Equity	21,750	19.19	0.81	15.54
Debt	5,000	8.10	0.19	1.54
	26,750			17.08

Workings Note:
(Rs. in lakh)

	All Equity	Debt and Equity
EBIT (as calculated above)	6,923.07	6,923.07
Interest to debt-holders	-	500.00

EBT	6,923.07	6,423.07
Taxes (35%)	2,423.07	2,248.07
Income available to equity shareholders	4,500.00	4,175.00
Income to debt holders plus income available to shareholders	4,500.00	4,675.00

Cost of Debenture (Kd) = $\dfrac{Rs.500(1-0.35)+\dfrac{(5,500-5,000)}{5}}{\dfrac{(5,500+5,000)}{2}}$

$\dfrac{Rs.325+100}{5,525}$ = 0.081 or 8.1%

QUESTION 7 : JAN 2021

A Limited and B Limited are identical except for capital structures. A Ltd has 60 per cent debt and 40 per cent equity, whereas B Ltd has 20 per cent debt and 80 per cent equity. (All percentages are in market – value terms.) The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) (i) IF X, owns 3 per cent of the equity shares of A Ltd, determine his return if the company has net operating income of Rs. 4,50,000 and the overall capitalization rate of the company, (K_0) is 18 per cent.

(ii) Calculate the implied required rate of return on equity of A Ltd

(b) B Ltd has the same net operating income as A Ltd

(i) Calculate the implied required equity return of B Ltd

(ii) Analyse why does is differ from that of A Ltd

SOLUTION :

(a) Value of A Ltd = $\dfrac{NOI}{K_e} = \dfrac{Rs.\ 4,50,000}{18\%}$ = Rs. 25,00,000

(i) Return on Shares of X on A Ltd

Particulars	**Amount**
Value of the company	25,00,000
Market Value of debt (60% x Rs. 25,00,000)	15,00,000
Market Value of shares (40% x Rs. 25,00,000)	**10,00,000**
Particulars	**Amount**
Net Operating Income	4,50,000
Interest on debt (8% Rs. 15,00,000)	1,20,000
Earnings available to shareholders	3,30,000
Return on 3% shares (3% x Rs. 3,30,000)	9,900

(ii) Implied required rate of return on equity of A Ltd = $\dfrac{Rs.\ 3,30,000}{Rs.\ 10,00,000}$ = 33%

(b) (i) Calculation of Implied rate of return of B Ltd

Particulars	Amount
Total Value of the company	25,00,000
Market Value of debt (20% x Rs. 25,00,000)	5,00,000
Market Value of equity (80% x Rs. 25,00,000)	**20,00,000**
Particulars	**Amount**
Net Operating Income	4,50,000
Interest on debt (8% Rs. 5,00,000)	40,000
Earnings available to shareholders	4,10,000

Implied required rate of return on equity = $\frac{Rs.\ 4,10,000}{Rs.\ 20,00,000} = 20.5\%$

(ii) Implied required rate of return on equity of B Ltd is lower than that of A Ltd. because B Ltd. uses less debt in its capital structure. As the equity capitalization is linear function on the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds.

QUESTION 8 : MTP – OCT 2021 / MTP – APR 2022

Following data is available in respect of two companies having same business risk: Capital employed = Rs. 4,00,000, EBIT = Rs. 60,000 and Ke = 12.5%

Sources	Levered Company (Rs.)	Unlevered Company (Rs.)
Debt (@10%)	2,00,000	Nil
Equity	2,00,000	4,00,000

An investor is holding 15% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

SOLUTION :

Valuation of firms

Particulars	Levered Firm (Rs.)	Unlevered Firm (Rs.)
EBIT	60,000	60,000
Less: Interest on debt (10% × Rs. 2,00,000)	20,000	Nil
Earnings available to Equity shareholders	40,000	60,000
Ke	12.50%	12.50%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	3,20,000	4,80,000
Debt (D)	2,00,000	Nil
Value of Firm (V) = S + D	5,20,000	4,80,000

Value of Levered company is more than that of unlevered company. Therefore, investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk

he will borrow proportionate amount and invest that amount also in shares of unlevered company.

Investment & Borrowings	**(Rs.)**
Sell shares in Levered company (Rs. 3,20,000 x 15%)	48,000
Borrow money (Rs. 2,00,000 x 15%)	30,000
Buy shares in Unlevered company	78,000

Change in Return	**(Rs.)**
Income from shares in Unlevered company (Rs. 78,000 x 12.5%)	9,750
Less: Interest on loan (Rs. 30,000 x 10%)	3,000
Net Income from unlevered firm	6,750
Less: Income from Levered firm (Rs. 48,000 x 12.5%)	6,000
Incremental Income due to arbitrage	750

QUESTION 9 : RTP – NOV 2021

Blue Ltd., an all equity financed company is considering the repurchase of Rs. 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is Rs. 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

(i) Market value of the company
(ii) Overall Cost of capital
(iii) Cost of equity

SOLUTION :

Workings :

Market Value of Equity = $\frac{(Net\ income\ (NI)\ for\ equity\ holders}{k_e}$

Rs.1,750 lakhs = $\frac{(Net\ income\ (NI)\ for\ equity\ holders}{0.20}$

Net Income to equity holders/EAT = Rs. 350 lakhs

Therefore, EBIT = $\frac{EAT}{(1-t)} = \frac{Rs.350 Lakhs}{(1-0.3)}$ = Rs.500 Lakhs

Income Statement

	All Equity (Rs. In lakhs)	**Equity & Debt (Rs. In lakhs)**
EBIT (as calculated above)	500	500
Interest on Rs. 275 lakhs @ 15%	-	41.25

EBT	500	458.75
Tax @ 30%	150	137.63
Income available to equity holders	350	321.12

(i) Market value of the company

Market value of levered firm = Value of unlevered firm + Tax Advantage
= Rs. 1,750 lakhs + (Rs. 275 lakhs x 0.3)
= Rs. 1,832.5 lakhs

Change in market value of the company = Rs. 1,832.5 lakhs 3 Rs. 1,750 lakhs
= Rs. 82.50 lakhs

The impact is that the market value of the company has increased by Rs. 82.50 lakhs due to replacement of equity with debt.

(ii) Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased
= Rs. 1,832.50 lakhs 3 Rs. 275 lakhs = Rs. 1,557.50 lakhs

Cost of Equity (Ke) = (Net Income to equity holders / Market value of equity) x 100
= (Rs. 321.12 lakhs / Rs. 1,557.50 lakhs) X 100 = 20.62%

Cost of debt (Kd) = I (1 - t) = 15 (1 - 0.3) = 10.50%

Components	Amount (Rs. In lakhs)	Cost of Capital %	Weight	WACC (Ko) %
Equity Debt	1,557.50	20.62	0.85	17.53
	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or Ko has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity

The impact is that cost of equity has risen by 0.62% (20.62% - 20%) due to the presence of financial risk i.e. introduction of debt in capital structure.

Note: Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

Cost of Capital (Ko) = Keu [1 3 (t x L)] Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate L = $\frac{Debt}{Debt + Equity}$

So, $K_o = 0.20 \left[1 - \left(0.3 \times \frac{Rs.275 Lakhs}{Rs.1,832.5 Lakhs}\right)\right]$ = 0.191 or 19.10% (approx..)

Cost of Equity (K_e) = K_{eu} + (K_{eu} – K_d) $\frac{Debt(1-t)}{Equity}$

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

K_d = Cost of debt

So, $K_e = 0.20 + \left((0.20 - 0.15) \times \frac{Rs.275Lakhs(1-0.30)}{Rs.1,557.5Lakhs} \right)$ = 0.2062 or 20.62%

QUESTION 10 : PAPER - NOV 2022

The following are the costs and values for the firms A and B according to the traditional approach

	Firm A	Firm B
Total Value of firm, V (in Rs)	50,000	60,000
Market value of Debt, D (in Rs)	0	30,000
Market value of equity E (in Rs)	50,000	30,000
Expected net operating income (in Rs)	5,000	5,000
Cost of Debt (in Rs)	0	1,800
Net Income (In Rs)	5,000	3,200
Cost of Equity, $K_e = NI/V$	10.00%	10.70%

i. Compute the Equilibrium value for Firm A and B in accordance with the M-M approach. Assume that (a) taxes do not exist and (b) the equilibrium value of K_e is 9.09%

ii. Compute Value of Equity and Cost of Equity for both the firms.

SOLUTION :

(i) Computation of Equilibrium value of Firms A & B under MM Approach:

As per MM approach K_o is equal to K_{eu}

$\therefore K_o = K_{eu}(1 - t) = 9.09 (1 - 0) = 9.09$

Particulars	A	B
EBIT (NOI) (Rs.)	5000	5000
K_o (%)	9.09	9.09
Equilibrium value (Rs.) (NOI/ K_o) X 100	55005.5	55005.5
	$\frac{5,000}{9.09}$ x 100	$\frac{5,000}{9.09}$ x 100

(ii) Computation of value of equity and cost of equity of Firms A & B

Particulars	A	B
Equilibrium value (Rs.)	55,005.5	55,005.5
Less: Value of Debt	-	30,000
Value of Equity	55,005.5	25,005.5

Cost of Equity of Firm A (unlevered) = 9.09

Cost of Debt of Firm B K_d (levered) = (1800/30000) x 100 = 6%

Cost of Equity of Firm B (Levered) = K_o + (K_o - K_d) x (Debt / Equity)

= 9.09 + (9.09 – 6) x (30000/25005.5)

= 9.09 + 3.09 x 1.2 = 9.09 + 3.71 = **12.80%**

OR

$$\text{Cost of Equity of Firm B (Levered)} = \left(\frac{NI}{Value \text{ of Equity}}\right) \text{x } 100$$

$$= \left(\frac{3200}{25005.5}\right) \text{x } 100 = 12.8\%$$

QUESTION 11 : MTP – APR 2023

Following data is available in respect of two companies having same business risk: Capital employed = Rs.12,00,000, EBIT = Rs. 2,40,000 and Ke = 15%

Sources	Dumbo Ltd (Rs.)	Jumbo Ltd (Rs.)
Debt (@12%)	4,00,000	Nil
Equity	8,00,000	12,00,000

An investor is holding 20% shares in the levered company. CALCULATE the increase in annual earnings of investor if arbitrage process is undertaken.

Also EXPLAIN the arbitrage process if Ke = 20% for Dumbo Ltd instead of 15%.

SOLUTION :

(i) Valuation of firms

Particulars	Dumbo Ltd (Rs.)	Jumbo Ltd (Rs.)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × Rs. 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	15%	15%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	12,80,000	16,00,000
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	16,80,000	16,00,000

Value of Levered company is more than that of unlevered company. Therefore, investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk he will borrow proportionate amount and invest that amount also in shares of unlevered company

(ii) Investment & Borrowings

	Rs.
Sell shares in Levered company (12,80,000 x 20%)	2,56,000
Borrow money (4,00,000 x 20%)	80,000
Buy shares in Unlevered company	3,36,000

(iii) Change in Return

	Rs.
Income from shares in Unlevered company (2,40,000 x 3,36,000/16,00,000)	50,400
Less: Interest on loan (80,000 x 12%)	9,600

Net Income from unlevered firm	40,800
Less: Income from Levered firm (1,92,000 x 20%)	38,400
Incremental Income due to arbitrage	2,400

Arbitrage process if Ke = 20%

(i) Valuation of firms

Particulars	Dumbo Ltd (Rs.)	Jumbo Ltd (Rs.)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × Rs. 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	20%	15%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	9,60,000	16,00,000
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	13,80,000	16,00,000

Value of unlevered company is more than that of levered company. Therefore, investor will sell his shares in unlevered company and buy proportionate shares and debt in levered company i.e. 20% share.

(ii) Investment & Borrowings

	Rs.
Sell shares in unlevered company (16,00,000 x 20%)	3,20,000
Buy shares in levered company (9,60,000 x 20%)	1,92,000 Buy Debt of levered
Company	1,28,000

(iii) Change in Return

	Rs.
Income from shares in levered company (1,92,000 x 20%)	38,400
Add: Interest on debt of levered (1,28,000 x 12%)	15,360
Net Income from levered firm	53,760
Less: Income from unlevered firm (2,40,000 x 20%)	48,000
Incremental Income due to arbitrage	5,760

QUESTION 12 : RTP - MAY 2024

Following data is available in respect of two companies having same business risk:
Capital employed = Rs. 3,00,000, EBIT = Rs. 45,000 and Ke = 12.5%

Sources	A Ltd Levered Company (Rs.)	B Ltd Unlevered Company (Rs.)
Debt (@10%)	1,50,000	Nil

Equity	1,50,000	3,00,000

An investor is holding 20% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

SOLUTION :

(i) Valuation of firms

Particulars	**A Ltd Levered Firm (Rs.)**	**B Ltd Unlevered Firm (Rs.)**
EBIT	45,000	45,000
Less: Interest on debt (10% × Rs. 1,50,000)	15,000	NIL
Earnings available to Equity shareholders	30,000	45,000
K_e	12.5%	12.5%
Value of Equity (S)	2,40,000	3,60,000
(Earnings available to Equity shareholders/ K_e)		
Debt (D)	1,50,000	Nil
Value of Firm (V) = S + D	3,90,000	3,60,000

Value of Levered company is more than that of unlevered company. Therefore, investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk he will borrow proportionate amount and invest that amount also in shares of unlevered company.

(ii) Investment & Borrowings

	Rs.
Sell shares in Levered company (Rs. 2,40,000 x 20%)	48,000
Borrow money (Rs. 1,50,000 x 20%)	30,000
Buy shares in Unlevered company	78,000

(iii) Change in Return

	Rs
Income from shares in Unlevered company	
(Rs. 78,000 x 12.5%)	9,750
Less: Interest on loan (Rs. 30,000 x 10%)	3,000
Net Income from unlevered firm	6,750
Less: Income from Levered firm (Rs. 48,000 x 12.5%)	6,000
Incremental Income due to arbitrage	750

QUESTION 13 : PAPER – MAY 2024

Following data is available in respect of Levered and Unlevered companies having same business risk :

Sources	Levered Company (Rs.)	Unlevered Company (Rs.)
Debt (@ 8%)	75,000	Nil
Equity	1,25,000	2,00,000

An investor holding 12% shares in levered company. Calculate the increase in annual earnings of investor if he switches over his holding from Levered to Unlevered company.

Thanks ….

CHAPTER

8

INVESTMENT DECISIONS

QUESTION 1 : MPT - AUG 2018 / RTP – MAY 2018

A company has to make a choice between two projects namely A and B. The initial capital outlay of two Projects are Rs.1,35,00,000 and Rs.2,40,00,000 respectively for A and B. There will be no scrap value at the end of the life of both the projects. The opportunity cost of capital of the company is 16%. The annual incomes are as under:

Year	Project A	Project B	Discounting factor @ 16%
1	--	60,00,000	0.862
2	30,00,000	84,00,000	0.743
3	1,32,00,000	96,00,000	0.641
4	84,00,000	1,02,00,000	0.552
5	84,00,000	90,00,000	0.476

You are required to CALCULATE for each project:

(i) Discounted payback period

(ii) Profitability index

(iii) Net present value

SOLUTION :

(1) Computation of Net Present Values of Projects

(Amount in Rest. '000)

Year	Cash flows		Discount factor @ 16 %	Discounted Cash flow	
	Project A (Rs.)	Project B (Rs.)		Project A (Rs.)	Project B (Rs.)
	(1)	(2)	(3)	(3) x (1)	(3) x (2)
0	(13,500)	(24,000)	1	(13,500)	(24,000)
1	--	6,000	0.862	--	5,172
2	3,000	8,400	0.743	2,229	6,241.2
3	13,200	9,600	0.641	8,461.2	6,153.6
4	8,400	10,200	0.552	4,636.8	5,630.4

5	8,400	9,000	0.476	3,998.4	4,284
Net present value				5,825.4	3,481.2

(2) Computation of Cumulative Present Values of Projects Cash inflows

(Amount in Rs. '000)

Year	Project A		Project B	
	PV of cash inflows (Rs.)	Cumulative PV (Rs.)	PV of cash inflows (Rs.)	Cumulative PV (Rs.)
1	--	--	5,172	51,72
2	2,229	22,29	6,241.2	11,413.2
3	8,461.2	10,690.2	6,153.6	17,566.8
4	4,636.8	15,327	5,630.4	23,197.2
5	3,998.4	19,325.4	4,284	27,481.2

(i) Discounted payback period: (Refer to Working note 2)

Cost of Project A = Rs.1,35,00,000 Cost of Project B = Rs.2,40,00,000

Cumulative PV of cash inflows of Project A after 4 years = Rs.1,53,27,000 Cumulative PV of cash inflows of Project B after 5 years = Rs.2,74,81,200

A comparison of projects cost with their cumulative PV clearly shows that the project A9s cost will be recovered in less than 4 years and that of project B in less than 5 years. The exact duration of discounted payback period can be computed as follows:

	Project A	Project B
Excess PV of cash inflows over the project cost (Rs.)	18,27,000 (Rs.1,53,27,000 – Rs.1,35,00,000)	34,81,200 (Rs. 2,74,81,200 – Rs.2,40,00,000)
Computation of period required to recover excess amount of cumulative PV over project cost (Refer to Working note 2)	0.39 year (Rs. 18,27,000 ÷ Rs.46,36,800)	0.81 years (Rs.34,81,200 ÷ Rs. 42,84,000)
Discounted payback period	3.61 year (4 -0.39) years	4.19 years (5 -0.81) years

Profitability Index = $\frac{\text{sum of discounted cash in flows}}{\text{intian cash only}}$

Profitability Index (for Project A) = $\frac{\text{Rs.1,9,32,5400}}{\text{Rs.1,35,00,000}}$ = 1.43

Profitability Index (for Project B) = $\frac{\text{Rs.2,74,81,200}}{\text{Rs.2,40,00,000}}$ = 1.15

(ii) Net present value (for Project A) = Rs.58,25,400 (Refer to Working note 1)

Net present value (for Project B) = Rs.34,81,200

QUESTION 2 : PAPER - MAY 2018

XYZ Ltd. is presently all equity financed. The directors of the company have been evaluating investment in a project which will require Rs 270 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of Rs 42 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applied to such investment decisions is 14% net.

The directors of the company believe that the current capital structure fails to take advantage of tax benefits of debt and propose to finance the new project with undated perpetual debt secured on the company's assets. The company intends to issue sufficient debt to cover the cost of capital expenditure and the after tax cost of issue.

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 10%. The after tax costs of issue are expected to be Rs 10 lakhs. Company's tax rate is 30%.

You are required to calculate

1. The adjusted present value of the investors
2. The adjusted discount rate and
3. Explain the circumstances under which this adjusted discount rate may be used to evaluate future investments.

SOLUTION :

(i) Calculation of Adjusted Present Value of Investment (APV)

Adjusted PV = Base Case PV + PV of financing decisions associated with the project

Base Case NPV for the project:

(-) Rs. 270 lakhs + (Rs. 42 lakhs / 0.14) = (-) Rs. 270 lakhs + Rs. 300 lakhs
= Rs. 30

Issue costs = Rs. 10 lakhs

Thus, the amount to be raised = Rs. 270 lakhs + Rs. 10 lakhs
= Rs. 280 lakhs

Annual tax relief on interest payment = Rs. 280 X 0.1 X 0.3
= Rs. 8.4 lakhs in perpetuity

The value of tax relief in perpetuity = Rs. 8.4 lakhs / 0.1
= Rs. 84 lakhs

Therefore, APV = Base case PV – Issue Costs + PV of Tax Relief on debt interest
= Rs. 30 lakhs – Rs. 10 lakhs + 84 lakhs = Rs. 104 lakhs

(ii) Calculation of Adjusted Discount Rate (ADR)

Annual Income / Savings required to allow an NPV to zero

Let the annual income be x.

(-) Rs.280 lakhs X (Annual Income / 0.14) = (-) Rs.104 lakhs

Annual Income / 0.14 = (-) Rs. 104 + Rs. 280 lakhs

Therefore, Annual income = Rs. 176 X 0.14 = Rs. 24.64 lakhs

Adjusted discount rate = (Rs. 24.64 lakhs / Rs.280 lakhs) X 100
= 8.8%

(iii) Useable circumstances

This ADR may be used to evaluate future investments only if the business risk of the new venture is identical to the one being evaluated here and the project is to be financed by the same method on the same terms. The effect on the company's cost of capital of introducing debt into the capital structure cannot be ignored.

QUESTION 3 : PAPER - MAY 2018

A company is evaluating a project that requires initial investment of Rs 60 lakhs in fixed assets and Rs 12 lakhs towards additional working capital

The Project is expected to increase annual real cash inflows before taxes by Rs 24,00,000 during its life. The fixed assets would have zero residual value at the end of life of 5 years. The company follows straight line method of depreciation which is expected for tax purpose also. Inflation is expected to be 6% per year. For evaluating similar projects, the company uses discounting rate of 12% in real terms. Company's tax rate is 30%.

Advice whether the company should accept the project, by calculating NPV in real terms.

PVIF (12%, 5 years)		PVIF (12%, 5 years)	
Year 1	0.893	Year 1	0.943
Year 2	0.797	Year 2	0.89
Year 3	0.712	Year 3	0.84
Year 4	0.636	Year 4	0.792
Year 5	0.567	Year 5	0.747

SOLUTION :

(i) Equipment's initial cost = Rs. 60,00,000 + Rs. 12,00,000
= Rs. 72,00,000

(ii) Annual straight line depreciation = Rs. 60,00,000/5
= Rs. 12,00,000.

(iii) Net Annual cash flows can be calculated as follows:

= Before Tax CFs × (1 – Tc) + Tc × Depreciation (Tc = Corporate tax i.e. 30%)

= Rs. 24,00,000 × (1 – 0.3) + (0.3 × Rs. 12,00,000)

= Rs. 16,80,000 + Rs. 3,60,000 = Rs. 20,40,000

So, Total Present Value = PV of inflow + PV of working capital released

= (Rs. 20,40,000 × PVIF 12%, 5 years) + (Rs. 12,00,000 × 0.567)

= (Rs. 20,40,000 × 3.605) + Rs. 6,80,400

= Rs. 73,54,200 + Rs. 6,80,400

= Rs. 80,34,600

So NPV = PV of Inflows – Initial Cost

= Rs. 80,34,600 – Rs. 72,00,000

= Rs. 8,34,600

Advice: Company should accept the project as the NPV is Positive

QUESTION 4 : RTP - NOV 2018

Shiv Limited is thinking of replacing its existing machine by a new machine which would cost Rs. 60 lakhs. The company9s current production is 80,000 units, and is expected to increase to 1,00,000 units, if the new machine is bought. The selling price of the product would remain unchanged at Rs. 200 per unit. The following is the cost of producing one unit of product using both the existing and new machine:

			Unit cost (Rs.)
	Existing Machine (80,000 units)	**New Machine (1,00,000 units)**	**Difference**
Materials	75.0	63.75	(11.25)
Wages & Salaries	51.25	37.50	(13.75)
Supervision	20.0	25.0	5.0
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.5	14.25	(1.25)
Depreciation	0.25	5.0	4.75
Allocated Corporate Overheads	10.0	12.50	2.5
	183.25	165.50	(17.75)

The existing machine has an accounting book value of Rs. 1,00,000, and it has been fully depreciated for tax purpose. It is estimated that machine will be useful for 5 years. The supplier of the new machine has offered to accept the old machine for Rs. 2,50,000. However, the market price of old machine today is Rs.1,50,000 and it is expected to be Rs. 35,000 after 5 years. The new machine has a life of 5 years and a salvage value of Rs. 2,50,000 at the end of its economic life. Assume corporate Income tax rate at 40%, and depreciation is charged on straight line basis for Income-tax purposes. Further assume that book profit is treated as ordinary income for tax purpose. The opportunity cost of capital of the Company is 15%.

Required:

(i) ESTIMATE net present value of the replacement decision.

(ii) CALCULATE the internal rate of return of the replacement decision.

(iii) Should Company go ahead with the replacement decision? ANALYSE.

Year (t)	**1**	**2**	**3**	**4**	**5**
$PVIF_{0.15,t}$	0.8696	0.7561	0.6575	0.5718	0.4972
$PVIF_{0.20,t}$	0.8333	0.6944	0.5787	0.4823	0.4019
$PVIF_{0.25,t}$	0.80	0.64	0.512	0.4096	0.3277
$PVIF_{0.30,t}$	0.7692	0.5917	0.4552	0.3501	0.2693
$PVIF_{0.35,t}$	0.7407	0.5487	0.4064	0.3011	0.223

SOLUTION :

(i) Net Cash Outlay of New Machine

Purchase Price	Rs. 60,00,000
Less: Exchange value of old machine [2,50,000 3 0.4(2,50,000 3 0)]	1,50,000

Rs. 58,50,000

Market Value of Old Machine: The old machine could be sold for Rs. 1,50,000 in the market. Since the exchange value is more than the market value, this option is not attractive. This opportunity will be lost whether the old machine is retained or replaced. Thus, on incremental basis, it has no impact.

Depreciation base: Old machine has been fully depreciated for tax purpose. Thus, the depreciation base of the new machine will be its original cost i.e. Rs. 60,00,000.

Net Cash Flows: Unit cost includes depreciation and allocated overheads. Allocated overheads are allocated from corporate office therefore they are Rs.elevant. The depreciation tax shield may be computed separately. Excluding depreciation and allocated overheads, unit costs can be calculated. The company will obtain additional revenue from additional 20,000 units sold.

Thus, after-tax saving, excluding depreciation, tax shield, would be

= {100,000(200 – 148) – 80,000(200 – 173)} × (1 – 0.40)

= {52,00,000 – 21,60,000} × 0.60

= Rs. 18,24,000

After adjusting depreciation tax shield and salvage value, net cash flows and net present value are estimated.

Calculation of Cash flows and Project Profitability

							Rs. ('000)
		0	**1**	**2**	**3**	**4**	**5**
1	After-tax savings	-	1824	1824	1824	1824	1824
2	Depreciation (Rs. 60,00,000 3 2,50,000)/5	-	1150	1150	1150	1150	1150
3	Tax shield on depreciation (Depreciation × Tax rate)	-	460	460	460	460	460
4	Net cash flows from operations (1 + 3)*	-	2284	2284	2284	2284	2284
5	Initial cost	(5850)					
6	Net Salvage Value (2,50,000 3 35,000)	-	-	-	-	-	215
7	Net Cash Flows (4+5+6)	(5850)	2284	2284	2284	2284	2499
8	PVF at 15%	1.00	0.8696	0.7561	0.6575	0.5718	0.4972
9	PV	(5850)	1986.2	1726.932	1501.73	1305.99	1242.50
10	NPV	Rs. 1913.32					

* Alternately Net Cash flows from operation can be calculated as follows:

Profit before depreciation and tax = Rs. 1,00,000 (200 – 148) – 80,000 (200 – 173)

= Rs. 52,00,000 3 21,60,000

= Rs. 30,40,000

So profit after depreciation and tax is Rs. (30,40,000 – 11,50,000) × (1 – .40)

= Rs. 11,34,000

So profit before depreciation and after tax is :

Rs. 11,34,000 + Rs. 11,50,000 (Depreciation added back) = Rs. 22,84,000

(ii)

						Rs. ('000)
	0	**1**	**2**	**3**	**4**	**5**
NCF	(5850)	2284	2284	2284	2284	2499
PVF at 20%	1.00	0.8333	0.6944	0.5787	0.4823	0.4019
PV	(58500	1903.257	1586.01	1321.751	1101.57	1004.35
PV of benefits	6916.94					
PVF at 30%	1.00	0.7692	0.5917	0.4550	0.3501	0.2693
PV	(5850)	1756.85	1351.44	1039.22	799.63	672.98
PV of benefits	5620.12					

RS. = 20% + 10% x $\frac{1066.94}{1296.82}$ = 28.23%

(iii) **Advise:** The Company should go ahead with replacement project, since it is positive NPV decision.

QUESTION 5 : PAPER - NOV 2018

PD Ltd. an existing company, is planning to introduce a new product with projected life of 8 years. Project cost will be Rs 2,40,00,000. At the end of 8 years no residual value will be realized. Working Capital of Rs 3,00,000 will be needed. The 100% capacity of the project is 2,00,000 units p.a but the production and sales volume is expected are as under

Year	**number of units**
1	60,000 units
2	80,000 units
3-5	1,40,000 units
6 – 8	1,20,000 units

Other information

1. Selling price per unit Rs 100
2. Variable cost is 40% of sales
3. Fixed cost P.a Rs 3,00,000
4. In addition to these advertisement expenditure will have to be incurred as under

Years	**1**	**2**	**3-5**	**6-8**
Expenditure (Rs)	50,00,000	25,00,000	10,00,000	5,00,000

5. Income Tax is 25%
6. Straight line method of depreciation is permissible for tax purpose
7. Cost of capital is 10%
8. Assume that loss cannot be carried forward

Present Value Table

Years	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
PV @ 10%	0.909	0.826	0.751	0.683	0.621	0.564	0513	0.467

Advise about the project acceptability.

SOLUTION :

Computation of initial cash outlay(COF)

	(Rs. in lakhs)
Project Cost	240
Working Capital	30
	270

Calculation of Cash Inflows(CIF):

Years	**1**	**2**	**03-May**	**06-Aug**
Sales in units	60,000	80,000	1,40,000	1,20,000
	Rs.	**Rs.**	**Rs.**	**Rs.**
Contribution (Rs. 200 x 60% x No. of Unit)	72,00,000	96,00,000	1,68,00,000	1,44,00,000
Less: Fixed cost	30,00,000	30,00,000	30,00,000	30,00,000
Less: Advertisement	50,00,000	25,00,000	10,00,000	5,00,000
Less: Depreciation (24000000/8) = 30,00,000	30,00,000	30,00,000	30,00,000	30,00,000
Profit /(loss)	(38,00,000)	11,00,000	98,00,000	79,00,000
Less: Tax @ 25%	NIL	2,75,000	24,50,000	19,75,000
Profit/(Loss) after tax	(38,00,000)	8,25,000	73,50,000	59,25,000
Add: Depreciation	30,00,000	30,00,000	30,00,000	30,00,000
Cash inflow	(8,00,000)	38,25,000	1,03,50,000	89,25,000

(Note: Since variable cost is 40%, Contribution shall be 60% of sales)

Computation of PV of CIF

Year	**CIF**	**PV Factor**	**Rs.**
	`	**@ 10%**	
1	(8,00,000)	0.909	(7,27,200)
2	38,25,000	0.826	31,59,450
3	1,03,50,000	0.751	77,72,850
4	1,03,50,000	0.683	70,69,050
5	1,03,50,000	0.621	64,27,350
6	89,25,000	0.564	50,33,700
7	89,25,000	0.513	45,78,525
8	89,25,000	0.467	55,68,975
Working Capital	30,00,000		
			3,88,82,700
	PV of COF		2,70,00,000
		NPV	**1,18,82,700**

Recommendation: Accept the project in view of positive NPV

QUESTION 6 : MAY 2019

AT Limited is considering three projects A, B and C. The cash flows associated with the projects are given below :

Cash flows associated with the Three Projects (Rs)

Project	C_0	C_1	C_2	C_3	C_4
A	(10,000)	2,000	2,000	6,000	0
B	(2,000)	0	2,000	4,000	6,000
C	(10,000)	2,000	2,000	6,000	10,000

You are required to:

(a) Calculate the payback period of each of three project.

(b) If the cut-off period is two years, then which projects should be accepted?

(c) Projects with positive NPV's if the opportunity cost of capital is 10 per cent

(d) "Payback gives too much weight to cash flows that occur after the cut-off date". True or false?

(e) "if a firm used a single cut-off period for all projects, it is likely to accept too many short lived projects". True or false?

P. V. Factor @ 10%

Year	0	1	2	3	4	5
P.V.	1.000	0.909	0.826	0.751	0.683	0.621

SOLUTION :

(a) Payback period of Projects

Project	C_0 (Rs)	C_1 (Rs)	C_2 (Rs)	C_3 (Rs)	Payback
A	(10,000)	2,000	2,000	6,000	2,000+2,000+6,000=10,000 i.e. 3 years
B	(2,000)	0	2,000	NA	0+2,000 =2,000 i.e. 2 years
C	(10,000)	2,000	2,000	6,000	2,000+2,000+6,000=10,000 i.e. 3 Years

(b) If standard payback period is **2 years,** Project B is the **only acceptable project**

(c) Calculation of NPV

Year	PVF @ 10%	Project A		Project B		Project C	
		Cash Flows (Rs.)	PV of cash Flows (Rs.)	Cash Flows (Rs.)	PV of cash Flows (Rs.)	Cash Flows (Rs.)	PV of cash Flows (Rs.)
0	1	(10,000)	(10,000)	(2,000)	(2,000)	(10,000)	(10,000)
1	0.909	2,000	1,818	0	0	2,000	1,818
2	0.826	2,000	1,652	2,000	1,652	2,000	1,652
3	0.751	6,000	4,506	4,000	3,004	6,000	4,506

4	0.683	0	0	6,000	4,098	10,000	6,830
NPV			(-2,024)		6,754		4,806

So, Projects with positive NPV are Project B & Project C

(d) **False.** Payback gives no weightage to cash flows after the cut-off date.

(e) **True.** The payback rule ignores all cash flows after the cutoff date, meaning that future years cash inflows are not considered. Thus, payback is biased towards short-term projects.

QUESTION 7 : NOV 2019

A company has Rs. 1,00,000 available for investment and has identified the following four investments in which to invest

Project	Investment (Rs)	NPV (Rs)
C	40,000	20,000
D	1,00,000	35,000
E	50,000	24,000
F	60,000	18,000

You are required to optimize the returns from a package of projects within the capital spending limit if

(i) The projects are independent of each other and are divisible

(ii) The projects are not divisible

SOLUTION :

(i) Optimizing returns when projects are independent and divisible.

Computation of NPVs per Re. 1 of Investment and Ranking of the Projects

Project	Investment (Rs.)	NPV (Rs)	NPV per Re. 1 invested (Rs.)	Ranking
C	40,000	20,000	0.50	1
D	1,00,000	35,000	0.35	3
E	50,000	24,000	0.48	2
F	60,000	18,000	0.30	4

Building up of a Package of Projects based on their Rankings

Project	Investment (Rs.)	NPV (Rs.)
C	40,000	20,000
E	50,000	24,000
D (1/10th of Project)	10,000	3,500
Total	1,00,000	47,500

The company would be well advised to invest in Project C, E and D (1/10th) and reject Project F to optimize return within the amount of Rs. 1,00,000 available for investment

(ii) Optimizing returns when projects are indivisible.

Package of Project	Investment (Rs.)	Total NPV (Rs.)
C and E	90,000 (40,000 + 50,000)	44,000 (20,000 + 24,000)
C and F	1,00,000 (40,000 + 60,000)	38,000 (20,000 + 18,000)
Only D	1,00,000	35,000

The company would be well advised to invest in Project C and E to optimize return within the amount of Rs. 1,00,000 available for investment.

QUESTION 8 : MTP – MAY 2020 / MTP – OCT 2023

A company proposes to install a machine involving a Capital Cost of Rs.72,00,000. The life of the machine is 5 years and its salvage value at the end of the life is nil. The machine will produce the net operating income after depreciation of Rs.13,60,000 per annum. The Company9s tax rate is 35%.

The Net Present Value factors for 5 years are as under:

Discounting Rate	14	15	16	17	18	19
Cumulative factor	3.43	3.35	3.27	3.20	3.13	3.06

You are required to COMPUTE the internal rate of return (RS.) of the proposal.

SOLUTION :

Computation of cash inflow per annum	**Rs.**
Net operating income per annum	13,60,000
Less: Tax @ 35%	4,76,000
Profit after tax	8,84,000
Add: Depreciation (Rs.72,00,000 / 5 years)	14,40,000
Cash inflow	23,24,000

The RS. of the investment can be found as follows: NPV = Rs. 72,00,000 + Rs. 23,24,000

$(PVAF_5, r) = 0$ or PVA F_5 r (Cumulative factor) = $\frac{Rs.72,00,000}{Rs.23,24,000}$ = 3.09

Computation of Internal Rate of Return (RS.)

Discounting rate	15%	19%
Cumulative factor	3.35	3.06
Total NPV (Rs.)	77,85,400 (Rs.23,24,000 ×3.35)	71,11,440 (Rs.23,24,000 ×3.06)
Internal outlay (Rs.)	72,00,000	72,00,000
Surplus (Deficit) (Rs.)	5,85,400	(88,560)

$$RS. = LR + \frac{\text{NPV at LR}}{\text{NPV at LR - NPV at HR}} \times (HR - LR)$$

$$= 15\% + \frac{5,85,400}{5,58,400 - (88,560)} \times (19\% - 15\%)$$

$$= 15\% + 3.47 = 18.47\%$$

QUESTION 9 : RTP - MAY 2020

A company is considering the proposal of taking up a new project which requires an investment of Rs.800 lakhs on machinery and other assets. The project is expected to yield the following earnings (before depreciation and taxes) over the next five years:

Year	Earnings (Rs. in lakhs)
1	320
2	320
3	360
4	360
5	300

The cost of raising the additional capital is 12% and assets have to be depreciated at 20% on written down value basis. The scrap value at the end of the five year period may be taken as zero. Income-tax applicable to the company is 40%.

You are required to CALCULATE the net present value of the project and advise the management to take appropriate decision. Also CALCULATE the Internal Rate of Return of the Project.

Note: Present values of Re. 1 at different rates of interest are as follows:

Year	10%	12%	14%	16%	20%
1	0.91	0.89	0.88	0.86	0.83
2	0.83	0.80	0.77	0.74	0.69
3	0.75	0.71	0.67	0.64	0.58
4	0.68	0.64	0.59	0.55	0.48
5	0.62	0.57	0.52	0.48	0.40

SOLUTION :

(i) Calculation of Net Cash Flow

(Rs. in lakhs)

Year	Profit before dep. and tax	Depreciation (20% on WDV)	PBT	PAT	Net cash flow
(1)	(2)	(3)	(4)	(5)	(3) + (5)
1	320	800 x 20% = 160	160	96	256
2	320	(800 – 160) x 20% = 128	192	115.20	243.20
3	360	(640 – 128) x 20% = 102.4	257.6	154.56	256.96
4	360	(512 – 102.4) x 20% = 81.92	278.08	166.85	248.77

5	300	(409.6 - 81.92) = 327.68*	-27.68	–16.61	311.07

*this is treated as a short term capital loss.

(ii) Calculation of Net Present Value (NPV)

(Rs. in lakhs)

Year	Net Cash Flow	12%		16%		20%	
		D.F	P.V	D.F	P.V	D.F	P.V
1	256	0.89	227.84	0.86	220.16	0.83	212.48
2	243.20	0.80	194.56	0.74	179.97	0.69	167.81
3	256.96	0.71	182.44	0.64	164.45	0.58	149.03
4	248.77	0.64	159.21	0.55	136.82	0.48	119.41
5	311.07	0.57	177.31	0.48	149.31	0.40	124.43
			941.36		850.71		773.16
	Less: Initial Investment		800.00		800.00		800.00
		NPV	141.36		50.71		-26.84

(iii) Advise: Since Net Present Value of the project at 12% = 141.36 lakhs, therefore the project should be implemented.

(iv) Calculation of Internal Rate of Return (IRR)

$$\text{IRR} = 16\% + \frac{50.71 \times 4}{50.71 - (-26.84)}$$

$$= 16\% + \frac{2.03}{77.55} = 16\% + 2.62\% = 18.62\%$$

QUESTION 10 : NOV 2020

CK Ltd is planning to buy a new machine. Details of which are as follows :

Cost of the Machine at the commencement	Rs. 2,50,000
Economic Life of the Machine	8 year
Residual Value	NIL
Annual Production Capacity of the Machine	1,00,000 Unit
Estimated Selling Price per unit	Rs. 6
Estimated Variable Cost per unit	Rs. 3
Estimated Annual Fixed Cost (Excluding depreciation)	Rs. 1,00,000
Advertisement Expenses in 1st year in addition of annual fixed cost	Rs. 20,000
Maintenance Expenses in 5th year in addition of annual fixed cost	Rs. 30,000
Cost of Capital	12%
Ignore Tax	

Analyse the above mentioned proposal using the Net Present Value Method and advice

P.V. factor @ 12% are as under:

Year	1	2	3	4	5	6	7	8
PV Factor	0.893	0.797	0.712	0.636	0.567	0.507	0.452	0.404

SOLUTION :

Calculation of Net Cash flows

Contribution = (Rs. 6 – Rs. 3) x 1,00,000 units = Rs. 3,00,000

Fixed costs (excluding depreciation) = Rs. 1,00,000

Year	Capital (Rs.)	Contribution (Rs.)	Fixed Costs (Rs.)	Advertisement / Maintenance expenses (Rs.)	Net Cash flow (Rs.)
0	(2,50,000)				(2,50,000)
1		3,00,000	(1,00,000)	(20,000)	1,80,000
2		3,00,000	(1,00,000)		2,00,000
3		3,00,000	(1,00,000)		2,00,000
4		3,00,000	(1,00,000)		2,00,000
5		3,00,000	(1,00,000)	(30,000)	1,70,000
6		3,00,000	(1,00,000)		2,00,000
7		3,00,000	(1,00,000)		2,00,000
8		3,00,000	(1,00,000)		2,00,000

Calculation of Net Present Value

Year	Net Cash flow (Rs.)	12% discount factor	Present Value (Rs.)
0	(2,50,000)	1.000	(2,50,000)
1	1,80,000	0.893	1,60,740
2	2,00,000	0.797	1,59,740
3	2,00,000	0.712	1,42,400
4	2,00,000	0.636	1,27,200
5	1,70,000	0.567	96,390
6	2,00,000	0.507	1,01,400
7	2,00,000	0.452	90,400
8	2,00,000	0.404	80,800
			7,08,730

Advise: CK Ltd should buy the new machine, as the net present value of the proposal is positive i.e. Rs. 7,08,730.

QUESTION 11 : JAN 2021

A company wants to buy a machine and two different models namely A and B are available. Following further particulars are available :

Particulars	Machine – A	Machine - B
Original Cost (Rs)	8,00,000	6,00,000
Estimated Life in Years	4	4
Salvage Value (Rs)	0	0

The company provides depreciation under Straight Line Method. Income tax rate applicable is 30%.

The present value of Rs. 1 at 12% discounting factor and net profit before depreciation and tax are as under :

Year	Net Profit Before Depreciation and tax		PV factor
	Machine – A Rs.	Machine – B Rs.	
1	2,30,000	1,75,000	0.893
2	2,40,000	2,60,000	0.797
3	2,20,000	3,20,000	0.712
4	5,60,000	1,50,000	0.636

Calculate :

1. NPV (Net Present Value)
2. Discounted pay-back period
3. PI (Profitability Index)

Suggest : Purchase of which machine is more beneficial under Discounted pay-back period method, NPV method and PI method.

SOLUTION :

Workings:

(i) Calculation of Annual Depreciation

Depreciation on Machine – A $= \frac{Rs.\ 8,00,000}{4} = \text{Rs. } 2,00,000$

Depreciation on Machine – B $= \frac{Rs.\ 6,00,000}{4} = \text{Rs. } 1,50,000$

(ii) Calculation of Annual Cash Inflows

Particulars	Machine A (Rs.)			
	1	2	3	4
Net Profit before Depreciation and Tax	2,30,000	2,40,000	2,20,000	5,60,000
Less : Depreciation	2,00,000	2,00,000	2,00,000	2,00,000
Profit before Tax	30,000	40,000	20,000	3,60,000
Less : Tax @ 30%	9,000	12,000	6,000	1,08,000
Profit after Tax	21,000	28,000	14,000	2,52,000
Add: Depreciation	2,00,000	2,00,000	2,00,000	2,00,000
Annual Cash Inflows	**2,21,000**	**2,28,000**	**2,14,000**	**4,52,000**

Particulars	Machine B (Rs.)			
	1	2	3	4

Net Profit before Depreciation and Tax	1,75,000	2,60,000	3,20,000	1,50,000
Less : Depreciation	1,50,000	1,50,000	1,50,000	1,50,000
Profit before Tax	25,000	1,10,000	1,70,000	0
Less : Tax @ 30%	7,500	33,000	51,000	0
Profit after Tax	17,500	77,000	1,19,000	0
Add: Depreciation	1,50,000	1,50,000	1,50,000	1,50,000
Annual Cash Inflows	**1,67,500**	**2,27,000**	**2,69,000**	**1,50,000**

(iii) Calculation of PV of Cash Flows

	Machine A				Machine B		
Year	**PV of Re 1 @ 12%**	**Cash Flow (Rs.)**	**PV (Rs)**	**Cumulative PV (Rs.)**	**Cash Flow (Rs.)**	**PV (Rs.)**	**Cumulative PV (Rs.)**
1	0.893	2,21,000	1,97,353	1,97,353	1,67,500	1,49,578	1,49,578
2	0.797	2,28,000	1,81,716	3,79,069	2,27,000	1,80,919	3,30,497
3	0.712	2,14,000	1,52,368	5,31,437	2,69,000	1,91,528	5,22,025
4	0.636	4,52,000	2,87,472	8,18,909	1,50,000	95,400	6,17,425

1. NPV (Net Present Value)

Machine – A

NPV = Rs. 8,18,909 – Rs. 8,00,000 = Rs. 18,09

Machine – B

NPV = Rs. 6,17,425 – Rs. 6,00,000 = Rs. 17,425

2. Discounted Payback Period

Machine – A

Discounted Payback Period $= 3 + \frac{Rs.\ 8,00,000 - Rs.\ 5,31,437}{Rs.\ 2,87,472}$

$= 3 + 0.934$

= 3.934 years or 3 years 11.21 months

Machine – B

Discounted Payback Period $= 3 + \frac{Rs.\ 6,00,000 - Rs.\ 5,22,025}{Rs.\ 95,400}$

$= 3 + 0.817$

= 3.817 years or 3 years 9.80 months

3. PI (Profitability Index)

Machine – A

Profitability Index $= \frac{Rs.\ 8,18,909}{Rs.\ 8,00,000} = 1.024$

Machine – B

Profitability Index $= \frac{Rs.\ 6,17,425}{Rs.\ 6,00,000} = 1.029$

Suggestion:

Method	Machine – A	Machine – B	Suggested Machine
Net Present Value	Rs. 18,909	Rs. 17,425	**Machine A**
Discounted Payback Period	3.934 years	3.817 years	**Machine B**
Profitability Index	1.024	1.029	**Machine B**

QUESTION 12 : PAPER - JULY 2021

An existing company has a machine which has been in operation for two years, its estimated remaining useful life is 4 years with no residual value in the end. Its current market value is Rs. 3 Lakhs. The management is considering a proposal to purchase an improved model of a machine which gives increase output. The details are as under :

Particulars	Existing Machine	New Machine
Purchase Price	Rs. 6,00,000	Rs. 10,00,000
Estimated Life	6 years	4 years
Residual Value	0	0
Annual Operating days	300	300
Operating hours per day	6	6
Selling price per unit	Rs. 10	Rs. 10
Material cost per unit	Rs. 2	Rs. 2
Output per hour in units	20	40
Labour cost per hour	Rs. 20	Rs. 30
Fixed overhead per annum excluding depreciation	Rs. 1,00,000	Rs. 60,000
Working Capital	Rs. 1,00,000	Rs. 2,00,000
Income-tax rate	30%	30%

Assuming that – cost of capital is 10% and the company uses written down value of depreciation @20% and it has several machines in 20% block.

Advice the management on the Replacement of Machine as per the NPV method.

The discounting factors table given below :

Discounting Factors	Year 1	Year 2	Year 3	Year 4
10%	0.909	0.826	0.751	0.683

SOLUTION :

(i) Calculation of Net Initial Cash Outflows:

Particulars	Rs.
Purchase Price of New machine	10,00,000
Add : Net working Capital	1,00,000
Less : Sale proceeds of existing machine	3,00,000
Net Initial cash outflows	8,00,000

(ii) Calculation of annual Profit Before Tax and depreciation

Particulars	Existing machine	New machine	Differential
(1)	(2)	(3)	(4)
Annual output	36,000 Units	72,000 Units	36,000 Units
(A) Sales revenue @ Rs. 10 per unit	3,60,000	7,20,000	3,60,000
(B) Cost of Operation			
Material @ Rs. 2 per unit	72,000	1,44,000	72,000
Labour			
Old = 1,800 x Rs. 20	36,000		
New = 1,800 x Rs. 30		54,000	18,000
Fixed overhead excluding depreciation	1,00,000	60,000	(40,000)
Total Cost (B)	2,08,000	2,58,000	50,000
Profit Before Tax & Depreciation (PBTD) (A – B)	**1,52,000**	**4,62,000**	**3,10,000**

(iii) Calculation of Net Present Value on replacement of machine

Year	PBTD	Depreciation @ 20% WDV	PBT	Tax @ 30%	PAT	Net Cash Flow	PVF @ 10%	PV
(1)	(2)	(3)	(4 = 2-3)	(5)	(6 = 4 – 5)	(7 = 6 + 3)	(8)	(9 = 7 x 8)
1	3,10,000	1,40,000	1,70,000	51,000	1,19,000	2,59,000	0.909	2,35,431.000
2	3,10,000	1,12,000	1,98,000	59,400	1,38,600	2,50,600	0.826	2,06,995.600
3	3,10,000	89,600	2,20,400	66,120	1,54,280	2,43,880	0.751	1,83,153.880
4	3,10,000	71,680	2,38,320	71,496	1,66,824	2,38,504	0.683	1,62,898.232
								7,88,478.712
Add : Release of net working capital at year end 4 (1,00,000 x 0.683								68,300.000
Less : Initial Cash Outflow								8,00,000.000
NPV								**56,778.712**

Advice: Since the incremental NPV is positive, existing machine should be replaced.

Working Notes:

1. Calculation of Annual Output

Annual output = (Annual operating days x Operating hours per day) x Output per hour

Existing machine = (300 x 6) x 20 = 1,800 x 20 = 36,000 units

New machine = (300 x 6) x 40 = 1,800 x 40 = 72,000 units

2. Base for incremental depreciation

Particulars		Rs.
WDV of Existing Machine		
Purchase price of existing machine		
Less : Depreciation for year 1	1,20,000	

Depreciation for Year 2	96,000	2,16,000
WDV of Existing Machine (i)		3,84,000
Depreciation base of New Machine		
Purchase price of new machine		10,00,000
Add : WDV of existing machine		3,84,000
Less : Sales value		3,00,000
Depreciation base of New Machine (ii)		**10,84,000**
Base for incremental depreciation [(iii) – (ii)]		**7,00,000**

(Note : The above solution have been done based on incremental approach)

QUESTION 13 : MTP - MAR 2022

A manufacturing company is presently paying a garbage disposer company Rs. 0.50 per kilogram to dispose-off the waste resulting from its manufacturing operations. At normal operating capacity, the waste is about 2,00,000 kilograms per year.

After spending Rs. 1,20,000 on research, the company discovered that the waste could be sold for Rs. 5 per kilogram if it was processed further. Additional processing would, however, require an investment of Rs. 12,00,000 in new equipment, which would have an estimated life of 10 years with no salvage value. Depreciation would be calculated by straight line method.

No change in the present selling and administrative expenses is expected except for the costs incurred in advertising Rs. 40,000 per year, if the new product is sold. Additional processing costs would include variable cost of Rs. 2.50 per kilogram of waste put into process along with fixed cost of Rs. 60,000 per year (excluding Depreciation).

There will be no losses in processing, and it is assumed that the total waste processed in a given year will be sold in the same year. Estimates indicate that 2,00,000 kilograms of the product could be sold each year.

The management when confronted with the choice of disposing off the waste or processing it further and selling it, seeks your ADVICE. Which alternative would you RECOMMEND? Assume that the firm' s cost of capital is 15% and it pays on an average 50% Tax on its income. Consider Present value of Annuity of Rs. 1 per year @ 15% p.a. for 10 years as 5.019.

SOLUTION :

Evaluation of Alternatives: Savings in disposing off the waste

Particulars	**(Rs.)**
Outflow (2,00,000 × Rs. 0.50)	1,00,000
Less: tax savings @ 50%	50,000
Net Outflow per year	50,000

Calculation of Annual Cash inflows in Processing of waste Material

Particulars	**Amount (Rs.)**	**Amount (Rs.)**
Sale value of waste (Rs. 5 × 2,00,000 kilograms)		10,00,000

Less: Variable processing cost (Rs. 2.50 × 2,00,000 kilograms)	5,00,000	
Less: Fixed processing cost	60,000	
Less: Advertisement cost	40,000	
Less: Depreciation	1,20,000	(7,20,000)
Earnings before tax (EBT)		2,80,000
Less: Tax @ 50%		(1,40,0000)
Earnings after tax (EAT)		1,40,000
Add: Depreciation		1,20,000
Annual Cash inflows		2,60,000

Total Annual Benefits = Annual Cash inflows + Net savings (adjusting tax) in disposal cost
= Rs. 2,60,000 + Rs. 50,000 = Rs. 3,10,000

Calculation of Net Present Value

Year	Particulars	Amount (Rs.)
0	Investment in new equipment	(12,00,000)
1 to 10	Total Annual benefits × PVAF(10 years, 15%)	
	Rs. 3,10,000 × 5.019	15,55,890
	Net Present Value	3,55,890

Recommendation: Processing of waste is a better option as it gives a positive Net Present Value.
Note- Research cost of Rs. 1,20,000 is not relevant for decision making as it is sunk cost.

QUESTION 14 : RTP - MAY 2022

ABC & Co. is considering whether to replace an existing machine or to spend money on revamping it. ABC & Co. currently pays no taxes. The replacement machine costs Rs. 18,00,000 now and requires maintenance of Rs. 2,00,000 at the end of every year for eight years. At the end of eight years, it would have a salvage value of Rs. 4,00,000 and would be sold. The existing machine requires increasing amounts of maintenance each year and its salvage value fall each year as follows:

Year	Maintenance (Rs.)	Salvage (Rs.)
Present	0	8,00,000
1	2,00,000	5,00,000
2	4,00,000	3,00,000
3	6,00,000	2,00,000
4	8,00,000	0

The opportunity cost of capital for ABC & Co. is 15%. REQUIRED:
When should the company replace the machine? The following present value table is given for you :

Year	Present value of Rs. 1 at 15% discount rate
1	0.8696
2	0.7561
3	0.6575
4	0.5718
5	0.4972
6	0.4323
7	0.3759
8	0.3269

SOLUTION :

ABC & Co. Equivalent Annual Cost (EAC) of new machine

		(Rs.)
(i)	Cost of new machine now	18,00,000
	Add: PV of annual repairs @ Rs. 2,00,000 per annum for 8 years	8,97,460
	(Rs. 2,00,000 x 4.4873)	26,97,460
		1,30,760
	Less: PV of salvage value at the end of 8 years (Rs. 4,00,000 x 0.3269)	25,66,700
	Equivalent annual cost (EAC) (Rs. 25,66,700/4.4873)	5,71,992

PV of cost of replacing the old machine in each of 4 years with new machine

Scenario	Year	Cash Flow	PV @ 15%	PV
		(Rs.)		(Rs.)
Replace Immediately	0	(5,71,992)	1.00	(5,71,992)
	0	8,00,000	1.00	8,00,000
				2,28,008
Replace in one year	1	(5,71,992)	0.8696	(4,97,404)
	1	(2,00,000)	0.8696	(1,73,920)
	1	5,00,000	0.8696	4,34,800
				(2,36,524)
Replace in two years	1	(2,00,000)	0.8696	(1,73,920)
	2	(5,71,992)	0.7561	(4,32,483)
	2	(4,00,000)	0.7561	(3,02,440)
	2	3,00,000	0.7561	2,26,830
				(6,82,013)
Replace in three years	1	(2,00,000)	0.8696	(1,73,920)
	2	(4,00,000)	0.7561	(3,02,440)
	3	(5,71,992)	0.6575	(3,76,085)
	3	(6,00,000)	0.6575	(3,94,500)

	3	2,00,000	0.6575	1,31,500
				(11,15,445)
Replace in four years	1	(2,00,000)	0.8696	(1,73,920)
	2	(4,00,0000	0.7561	(3,02,440)
	3	(6,00,000)	0.6575	(3,94,500)
	4	(5,71,992)	0.5718	(3,27,065)
	4	(8,00,000)	0.5718	(4,57,440)
				(16,55,365)

Advice: The company should replace the old machine immediately because the PV of cost of replacing the old machine with new machine is least.

QUESTION 15 : PAPER - MAY 2022

Alpha Limited is a manufacturer of computers. It wants to introduce artificial intelligence while making computers. The estimated annual saving from introduction of the artificial intelligence (AI) is as follows :

- Reduction of five employees with annual salaries of Rs. 3,00,000 each.
- Reduction of Rs. 3,00,000 in production delays caused by inventory problem
- Reduction in lost sales Rs. 2,50,000 and
- Gain due to timely billing Rs. 2,00,000

The purchase price of the system for installation of artificial intelligence is Rs. 20,00,000 and installation cost is Rs. 1,00,000. 80% of the purchase price will be paid in the year of purchase and remaining will be paid in next year.

The estimated life of the system is 5years and it will be depreciated on a straight line basis.

However, the operation of the new system requires two computer specialties with annual salaries of Rs. 5,00,000 per person.

In addition to above, annual maintenance and operating cost for five years are as below :

Year	**1**	**2**	**3**	**4**	**5**
Maintenance & operating cost	2,00,000	1,80,000	1,60,000	1,40,000	1,20,000

Maintenance and operating cost are payable in advance.

The company's tax rate is 30% and its required rate of return is 15%

Year	**1**	**2**	**3**	**4**	**5**
$PVIF_{0.10,t}$	0.909	0.826	0.751	0.683	0.621
$PVIF_{0.12,t}$	0.893	0.797	0.712	0.636	0.567
$PVIF_{0.15,t}$	0.870	0.756	0.658	0.572	0.497

Evaluate the project by using Net Present Value and Profitability Index.

SOLUTION :

Computation of Annual Cash Flow after Tax						
Particulars	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Savings in Salaries		15,00,000	15,00,000	15,00,000	15,00,000	15,00,000

Reduction in Production Delays		3,00,000	3,00,000	3,00,000	3,00,000	3,00,000
Reduction in Lost Sales		2,50,000	2,50,000	2,50,000	2,50,000	2,50,000
Gain due to timely billing		2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
Salary to computer specialist		(10,00,000)	(10,00,000)	(10,00,000)	(10,00,000)	(10,00,000)
Maintenance and Operating Cost (payable in advance)		(2,00,000)	(1,80,000)	(1,60,000)	(1,40,000)	(1,20,000)
Depreciation (21 lakhs/5)		(4,20,000)	(4,20,000)	(4,20,000)	(4,20,000)	(4,20,000)
Gain Before Tax		6,30,000	6,50,000	6,70,000	6,90,000	7,10,000
Less: Tax (30%)		1,89,000	1,95,000	2,01,000	2,07,000	2,13,000
Gain After Tax		4,41,000	4,55,000	4,69,000	4,83,000	4,97,000
Add: Depreciation		4,20,000	4,20,000	4,20,000	4,20,000	4,20,000
Add: Maintenance and Operating Cost (payable in advance)		2,00,000	1,80,000	1,60,000	1,40,000	1,20,000
Less: Maintenance and Operating Cost (payable in advance)	(2,00,000)	(1,80,000)	(1,60,000)	(1,40,000)	(1,20,000)	-
Net CFAT	(2,00,000)	8,81,000	8,95,000	9,09,000	9,23,000	10,37,000

Note: Annual cash flows can also be calculated Considering tax shield on depreciation & maintenance and operating cost. There will be no change in the final cash flows after tax.

Computation of NPV				
Particulars	Year	Cash Flows (Rs)	PVF	PV (Rs)
Initial Investment (80% of 20 Lacs)	0	16,00,000	1	16,00,000
Installation Expenses	0	1,00,000	1	1,00,000
Instalment of Purchase Price	1	4,00,000	0.870	3,48,000
PV of Outflows (A)				**20,48,000**
CFAT	0	(2,00,000)		(2,00,000)
CFAT	1	8,81,000		7,66,470
CFAT	2	8,95,000		6,76,620
CFAT	3	9,09,000		5,98,122
CFAT	4	9,23,000		5,27,956
CFAT	5	10,37,000		5,15,389
PV of Inflows (B)				**28,84,557**
NPV (B-A)				**8,36,557**
Profitability Index (B/A)				**1.408 or 1.41**

Evaluation: Since the NPV is positive (i.e. Rs 8,36,557) and Profitability Index is also greater than 1 (i.e. 1.41), Alpha Ltd. may introduce artificial intelligence (AI) while making computers

QUESTION 16 : MTP - SEPT 2022

Embros Ltd. is planning to invest in a new product with a project life of 8 years. Initial equipment cost will be Rs. 35 crores. Additional equipment costing Rs. 2.50 crores will be purchased at the end of the third year from the cash inflow of this year. At the end of 8th year, the original equipment will have no resale value, but additional equipment can be sold at 10% of its original cost. A working capital of Rs. 4 crores will be needed, and it will be released at the end of 8th year. The project will be financed with sufficient amount of equity capital.

The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4 – 5	6 – 8
Units	14,40,000	21,60,000	52,00,000	54,00,000	36,00,000

Sales price of Rs. 120 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount Rs. 3.60 crores per year. The loss of any year will be set off from the profits of subsequent year. The company follows straight line method of depreciation and is subject to 30% tax rate. Considering 12% after-tax cost of capital for this project, you are required to CALCULATE the net present value (NPV) of the project and advise the management to take appropriate decision. PV factors @ 12% are:

Year	1	2	3	4	5	6	7	8
	.893	.797	.712	.636	.567	.507	.452	.404

SOLUTION :

Calculation of year-wise Cash Inflow

(Rs. in crores)

Year	Sales	VC (60% of Sales Value)	FC	Dep.	Profit	Tax (@30%)	PAT	Dep.	Cash inflow
1	17.28	10.368	3.6	4.375	(1.063)	-	(1.0630)	4.375	3.312
2	25.92	15.552	3.6	4.375	2.393	0.3990*	1.9940	4.375	6.369
3	62.4	37.44	3.6	4.375	16.985	5.0955	11.89895	4.375	16.2645
4-5	64.8	38.88	3.6	4.825#	17.495	5.2485	12.2465	4.825	17.0715
6-8	43.2	25.92	3.6	4.825	8.855	2.6565	6.1985	4.825	11.0235

*(30% of 2.393 – 30% of 1.063) = 0.7179 – 0.3189 = 0.3990

#4.375 + (2.50 – .25)/5 = 4.825

Calculation of Cash Outflow at the beginning

Particulars	Rs.
Cost of New Equipment	35,00,00,000
Add: Working Capital	4,00,00,000
Outflow	39,00,00,000

Calculation of NPV

Year	Cash inflows	PV factor	NPV

	(Rs.)		(Rs.)
1	3,31,20,000	.893	2,95,76,160
2	6,36,90,000	.797	5,07,60,930
3	16,26,45,000 – 2,50,00,000 = 13,76,45,000	.712	9,80,03,240
4	17,07,15,000	.636	10,85,74,740
5	17,07,15,000	.567	9,67,95,405
6	11,02,35,000	.507	5,58,89,145
7	11,02,35,000	.452	4,98,26,220
8	11,02,35,000 + 4,00,00,000 + 25,00,000 = 15,27,35,000	.404	6,17,04,940
	Present Value of Inflow		55,11,30,780
	Less: Out flow		39,00,00,000
	Net Present Value		16,11,30,780

Advise: Since the project has a positive NPV, it may be accepted.

QUESTION 17 : PAPER - NOV 2022

A hospital is considering to purchase a diagnostic machine costing Rs. 80,000. The projected life of the machine is 8 years and has an expected salvage value of Rs. 6,000 at the end of 8 years. The annual operating cost of the machine is Rs. 7,500. It is expected revenues of Rs. 40,000 per year for eight years. Presently, the hospital is outsourcing the diagnostic work and is earning commission income of Rs. 12000 per annum.

Consider tax rate of 30% and Discounting Rate as 10%

Advice:

Whether it would be profitable for the hospital to purchase the machine?

Give your recommendation as per Net Present Value method and Present Value Index method under below mentioned two situations:

i. If Commission income of Rs. 12000 p.a. is before taxes.

ii. If Commission income of Rs. 12000 p.a. is net taxes.

Given:

t	1	2	3	4	5	6	7	8
PVIF (t, 10%)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

SOLUTION :

Analysis of Investment Decisions

Determination of Cash inflows	Situation-(i) Commission Income before taxes	Situation-(ii) Commission Income after taxes
Cash flow up-to 7th year		
Sales Revenue	40,000	40,000
Less: Operating Cost	(7,500)	(7,500)
	32,500	32500

Less: Depreciation (80,000 – 6,000) ÷ 8	(9,250)	(9,250)
Net Income	23,250	23,250
Tax @ 30%	(6,975)	(6,975)
Earnings after Tax (EAT)	16,275	16,275
Add: Depreciation	9,250	9,250
Cash inflow after tax per annum	25,525	25,525
Less: Loss of Commission Income	(8,400)	(12,000)
Net Cash inflow after tax per annum	17,125	13,525
In 8th Year:		
Net Cash inflow after tax	17,125	13,525
Add: Salvage Value of Machine	6,000	6,000
Net Cash inflow in year 8	**23,125**	**19,525**

Calculation of Net Present Value (NPV) and Profitability Index (PI)

	Particulars	**PV factor @10%**	**Situation-(i) [Commission Income before taxes]**	**Situation-(iI) [Commission Income after taxes]**
A	Present value of cash inflows (1st to 7th year)	4.867	83,347.38 (17,125 × 4.867)	65,826.18 (13,525 × 4.867)
B	Present value of cash inflow at 8th year	0.467	10,799.38 (23,125 × 0.467)	9,118.18 (19,525 × 0.467)
C	PV of cash inflows	1.00	94,146.76	74,944.36
D	Less: Cash Outflow		(80,000)	(80,000)
E	**Net Present Value (NPV)**		**14,146.76**	**(5,055.64)**
F	**PI = (C÷D)**		**1.18**	**0.94**

Recommendation: The hospital may consider purchasing of diagnostic machine in situation (i) where commission income is 12,000 before tax as NPV is positive and PI is also greater than 1. Contrary to situation (i), in situation (ii) where the commission income is net of tax, the recommendation is reversed to not purchase the machine as NPV is negative and PI is also less than 1.

QUESTION 18 : MTP - MAR 2023

Yellow bells Ltd. wants to replace its old machine with new automatic machine. The old machine had been fully depreciated for tax purpose but has a book value of Rs.3,50,000 on 31st March 2022. The machine cannot fetch more than Rs.45,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered Rs.1,60,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of Rs.6,50,000. The expected life of new machine is 10 years with salvage value of Rs.63,000.

Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 9% is allowed taking that this is the only machine in the block of assets.

Given below are the expected sales and costs from both old and new machine:

	Old machine (Rs.)	New machine (Rs.)
Sales	11,74,500	11,74,500
Material cost	2,61,000	1,83,063
Labour cost	1,95,750	1,59,500
Variable overhead	81,563	68,875
Fixed overhead	1,30,500	1,41,375
Depreciation	34,800	60,175
Profit Before Tax (PBT)	4,70,888	5,61,513
Tax @ 25%	1,17,722	1,40,378
Profit After Tax (PAT)	3,53,166	4,21,134

From the above information, ANALYSE whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.

PV factors @ 10% :

Year	1	2	3	4	5	6	7	8	9	10
PVF	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386

SOLUTION :

(i) Calculation of Base for depreciation or Cost of New Machine

Particulars	(Rs.)
Purchase price of new machine	6,50,000
Less: Sale price of old machine	1,60,000
	4,90,000

(ii) Calculation of Profit before tax as per books

Particulars	Old machine (Rs.)	New machine (Rs.)	Difference (Rs.)
PBT as per books	4,70,888	5,61,513	90,625
Add: Depreciation as per books	34,800	60,175	25,375
Profit before tax and depreciation (PBTD)	5,05,688	6,21,688	1,16,000

Calculation of Incremental NPV

Year	PVF	PBTD	Dep. @ 9%	PBT	Tax @ 25%	Cash Inflows	PV of Cash Inflows
	@10%	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
	1	2	3	4(2 - 3)	(5) = (4) x 0.25	(6) = (4) - (5) + (3)	(7) = (6) x (1)

1	0.909	1,16,000.00	44,100.00	71,900.00	17,975.00	98,025.00	89,104.73
2	0.826	1,16,000.00	40,131.00	75,869.00	18,967.25	97,032.75	80,149.05
3	0.751	1,16,000.00	36,519.21	79,480.79	19,870.20	96,129.80	72,193.48
4	0.683	1,16,000.00	33,232.48	82,767.52	20,691.88	95,308.12	65,095.45
5	0.621	1,16,000.00	30,241.56	85,758.44	21,439.61	94,560.39	58,722.00
6	0.564	1,16,000.00	27,519.82	88,480.18	22,120.05	93,879.95	52,948.29
7	0.513	1,16,000.00	25,043.03	90,956.97	22,739.24	93,260.76	47,842.77
8	0.467	1,16,000.00	22,789.16	93,210.84	23,302.71	92,697.29	43,289.63
9	0.424	1,16,000.00	20,738.14	95,261.86	23,815.47	92,184.53	39,086.24
10	0.386	1,16,000.00	18,871.70	97,128.30	24,282.07	91,717.93	35,403.12
							5,83,834.77
Add: PV of Salvage value of new machine (Rs.63,000 ´ 0.386)							24,318.00
Total PV of incremental cash inflows							6,08,152.77
Less: Cost of new machine [as calculated in point(i)]							4,90,000.00
Incremental Net Present Value							1,18,152.77

Analysis: Since the Incremental NPV is positive, the old machine should be replaced.

QUESTION 19 : RTP - MAY 2023

Dharma Ltd, an existing profit-making company, is planning to introduce a new product with a projected life of 8 years. Initial equipment cost will be Rs. 240 lakhs and additional equipment costing Rs. 26 lakhs will be needed at the beginning of third year. At the end of 8 years, the original equipment will have resale value equivalent to the cost of removal, but the additional equipment would be sold for Rs. 2 lakhs. Working Capital of Rs. 25 lakhs will be needed at the beginning of the operations. The 100% capacity of the plant is of 4,00,000 units per annum, but the production and sales volume expected are

Year	Capacity (%)
1	20
2	30
3-5	75
6-8	50

A sale price of Rs. 100 per unit with a profit volume ratio (contribution/sales) of 60% is likely to be obtained. Fixed operating cash cost are likely to be Rs. 16 lakhs per annum. In addition to this the advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure (Rs. Lakhs each year)	30	15	10	4

The company is subjected to 50% tax rate and consider 12% to be an appropriate cost of capital. Straight line method of depreciation is followed by the company. ADVISE the management on the desirability of the project.

SOLUTION :

Calculation of Cash Flow After tax

	Year	1	2	3 to 5	6 to 8
A	Capacity	20%	30%	75%	50%
B	Units	80,000	1,20,000	3,00,000	2,00,000
C	Contribution p.u.	Rs.60	Rs.60	Rs.60	Rs.60
D	Contribution	Rs.48,00,000	Rs.72,00,000	Rs.1,80,00,000	Rs.1,20,00,000
E	Fixed Cash Cost	Rs.16,00,000	Rs.16,00,000	Rs.16,00,000	Rs.16,00,000
	Depreciation				
F	Original Equipment (Rs.240 Lakhs / 8)	Rs.30,00,000	Rs.30,00,000	Rs.30,00,000	Rs.30,00,000
G	Additional Equipment (Rs.24 Lakhs / 6)	-	-	Rs.40,00,000	Rs.4,00,000
H	Advertisement Expenditure	Rs.30,00,000	Rs.15,00,000	Rs.10,00,000	Rs.4,00,000
I	Profit Before Tax (D- E-F-G-H)	Rs.(28,00,000)	Rs.11,00,000	Rs.1,20,00,000	Rs.66,00,000
J	Tax savings / (expenditure)	Rs.14,00,000	Rs.(5,50,000)	Rs(60,00,000)	Rs(33,00,000)
K	Profit After Tax	Rs(14,00,000)	Rs.5,50,000	Rs.60,00,000	Rs.33,00,000
L	Add: Depreciation (F + G)	Rs.30,00,000	Rs.30,00,000	Rs.34,00,000	Rs.34,00,000
M	Cash Flow After Tax	Rs.16,00,000	Rs.35,50,000	Rs.94,00,000	Rs.67,00,000

Calculation of NPV

Year	Particulars	Cash Flows	PV factor	PV
0	Initial Investment	Rs. (2,40,00,000)	1.000	Rs. (2,40,00,000)
0	Working Capital Introduced	Rs. (25,00,000)	1.000	Rs. (25,00,000)
1	CFAT	Rs.16,00,000	0.893	Rs. 14,28,800
2	CFAT	Rs. 35,50,000	0.797	Rs. 28,29,350
2	Additional Equipment	Rs. (26,00,000)	0.797	Rs. (20,72,200)
3	CFAT	Rs. 94,00,000	0.712	Rs. 66,92,800
4	CFAT	Rs. 94,00,000	0.636	Rs. 59,78,400
5	CFAT	Rs. 94,00,000	0.567	Rs. 53,29,800
6	CFAT	Rs. 67,00,000	0.507	Rs. 33,96,900
7	CFAT	Rs. 67,00,000	0.452	Rs. 30,28,400
8	CFAT	Rs. 67,00,000	0.404	Rs. 27,06,800
8	WC Released	Rs. 25,00,000	0.404	Rs. 10,10,000
8	Salvage Value	Rs. 2,00,000	0.404	Rs. 80,800
	Net Present Value			Rs.39,09,850

Since the NPV is positive, the proposed project should be implemented.

QUESTION 20 : PAPER - MAY 2023

Four years ago Z Ltd had purchased a machine of Rs. 4,80,000 having estimated useful life of 8 years with zero salvage value. Depreciation is charged using SLM method over the useful life. The

company wants to replace this machine with a new machine. Details of new machine are as below:

- Cost of new machine is Rs. 12,00,000. Vendor of this machine agree to take old machine at a value of Rs. 2,40,000. Cost of dismantling and removal of old machine will be Rs. 40,000. 80% of net purchase price will be paid on spot and remaining will be paid at the end of one year.
- Depreciation will be charged @20% p.a. under WDV method.
- Estimated useful life of new machine is four years and it has salvage value of Rs. 1,00,000 at the end of year four.
- Incremental annual sales revenue is Rs. 12,25,000
- Contribution margin is 50%
- Incremental indirect cost (excluding depreciation) is Rs. 1,18,750 per year.
- Additional working capital of Rs. 2,50,000 is required at the beginning of year one and Rs. 3,00,000 at the beginning of year three. Working capital at the end of year four will be nil.
- Tax rate is 30%.
- Ignore tax on capital gain

Z Ltd will not make any additional investment, if it yields less than 12%.

Advice, whether existing machine should be replaced or not

Year	1	2	3	4	5
$PVIF_{0.12,t}$	0.893	0.797	0.712	0.636	0.567

SOLUTION :

Working Notes:

(i) Calculation of Net Initial Cash Outflow

Particulars	Rs.
Cost of New Machine	12,00,000
Less: Sale proceeds of existing machine	2,00,000
Net Purchase Price	10,00,000
Paid in year 0	8,00,000
Paid in year 1	2,00,000

(ii) Calculation of Additional Depreciation

Year	1	2	3	4
	Rs.	Rs.	Rs.	Rs.
Opening WDV of machine	10,00,000	8,00,000	6,40,000	5,12,000
Depreciation on new machine @ 20%	2,00,000	1,60,000	1,28,000	1,02,400
Closing WDV	8,00,000	6,40,000	5,12,000	4,09,600
Depreciation on old machine (4,80,000/8)	60,000	60,000	60,000	60,000
Incremental depreciation	**1,40,000**	**1,00,000**	**68,000**	**42,400**

(iii) Calculation of Annual Profit before Depreciation and Tax (PBDT)

Particulars	Incremental Values (Rs.)
Sales	12,25,000
Contribution	6,12,500
Less: Indirect Cost	1,18,750
Profit before Depreciation and Tax (PBDT)	4,93,750

Calculation of Incremental NPV

Year	PVF @ 12% (Rs)	PBTD (Rs)	Incremental Depreciation (Rs)	PBT (Rs)	Tax @ 30% (Rs)	Cash Inflows (Rs)	PV of Cash Inflows (Rs)
	(1)	(2)	(3)	(4)	(5) = (4) x 0.30	(6) = (4) – (5) + (3)	(7) = (6) x (1)
1	0.893	4,93,750	1,40,000	3,53,750	1,06,125	3,87,625	3,46,149.125
2	0.797	4,93,750	1,00,000	3,93,750	1,18,125	3,75,625	2,99,373.125
3	0.712	4,93,750	68,000	4,25,750	1,27,725	3,66,025	2,60,609.800
4	0.636	4,93,750	42,400	4,51,350	1,35,405	3,58,345	2,27,907.420
*							**11,34,039.470**
*							
Add: PV of Salvage (Rs. 1,00,000 x 0.636)							63,600
Less: Initial Cash Outflow - Year 0							8,00,000
Year 1 (Rs. 2,00,000 × 0.893)							1,78,600
Less: Initial Cash Outflow - Year 0							2,50,000
Year 2 (Rs. 3,00,000 × 0.797)							2,39,100
Add: Working Capital released - Year 4 (Rs. 5,50,000 × 0.636)							3,49,800
Incremental Net Present Value							**79,739.470**

Since the incremental NPV is positive, existing machine should be replaced.

Alternative Presentation

Computation of Outflow for new Machine:

	Rs.
Cost of new machine	12,00,000
Replaced cost of old machine	2,40,000
Cost of removal	40,000
Net Purchase price	10,00,000
Outflow at year 0	8,00,000
Outflow at year 1	2,00,000

Computation of additional deprecation

Year	1 (Rs)	2 (Rs)	3 (Rs)	4 (Rs)
Opening WDV of machine	10,00,000	8,00,000	6,40,000	5,12,000

Depreciation on new machine @ 20%	2,00,000	1,60,000	1,28,000	1,02,400
Closing WDV	8,00,000	6,40,000	5,12,000	4,09,600
Depreciation on old machine (4,80,000/8)	60,000	60,000	60,000	60,000
Incremental depreciation	1,40,000	1,00,000	68,000	42,400

Computation of NPV

	Year	0 Rs.	1 Rs.	2 Rs.	3 Rs.	4 Rs.
1	Increase in sales revenue		12,25,000	12,25,000	12,25,000	12,25,000
2	Contribution		6,12,500	6,12,500	6,12,500	6,12,500
3	Increase in fixed cost		1,18,750	1,18,750	1,18,750	1,18,750
4	Incremental Depreciation		1,40,000	1,00,000	68,000	42,400
5	Net profit before tax [1-(2+3+4)]		3,53,750	3,93,750	4,25,750	4,51,350
6	Net Profit after tax (5 x 70%)		2,47,625	2,75,625	2,98,025	3,15,945
7	Add: Incremental depreciation		1,40,000	1,00,000	68,000	42,400
8	Net Annual cash inflows (6 + 7)		3,87,625	3,75,625	3,66,025	3,58,345
9	Release of salvage value					1,00,000
10	(investment)/disinvestment in working capital	(2,50,000)		(3,00,000)		5,50,000
11	Initial cost	(8,00,000)	(2,00,000)			
12	Total net cash flows	(10,50,000)	1,87,625.0	75,625	3,66,025	10,08,345
13	Discounting Factor	1	0.893	0.797	0.712	0.636
14	Discounted cash flows (12 x 13)	(10,50,000)	1,67,549.125	60,273.125	2,60,609.800	641307.420

NPV = (1,67,549 + 60,273 + 2,60,610 + 6,41,307) – 10,50,000 = Rs.79,739
Since the NPV is positive, existing machine should be replaced.

QUESTION 21 : PAPER - NOV 2023

ABC Ltd is considering to purchase a machine which is priced at Rs. 5,00,000. The estimated life of machine is 5 years and has an expected salvage value of Rs. 45,000 at the end of 5 years. It is expected to generate revenue of Rs. 1,50,000 per annum for five years. The annual operating cost of the machine is Rs. 28,125, Corporate Tax Rate is 20% and the cost of capital is 10%
You are required to analyse whether it would be profitable for the company to purchase the machine by using :

i. Payback period Method
ii. Net Present value Method
iii. Profitability Index method

SOLUTION :

Computation of annual flows

Particular	Rs.
Revenue	1,50,000
Less : Operating Cost	(28,125)
Less : Depreciation $\frac{(50,00,000-45,000)}{5}$	(91,000)
Profit before tax	30,875
Less :Tax	(6,175)
Profit After tax	24,700
Add: Depreciation	91,000
Annual Cash Inflows	1,15,700

i) Computation of Payback Period

Year	Cash Flows	Cumulative Present Value
1	1,15,700	1,15,700
2	1,15,700	2,31,400
3	1,15,700	3,47,100
4	1,15,700	4,62,800
5 (Including Salvage)	1,60,700	6,23,500

Amount to be recovered in 5th year cash flow = 5,00,000 – 4,62,800 = 37,200

Payback period = 4years + $\frac{37,200}{1,60,700} = 4.23\ years$

Since the payback periods is less than the life of machinery, the company may purchase the machine.

ii) Computation of Net Present Value :

Year	Cash Flows	PVF @ 10%	Present Value
0	(5,00,000)	1.000	(5,00,000)
1 – 5	1,15,700	3.791	4,38,594
5	45,000	0.621	27,941
Net Present Value			(33,465)

Since the net present value (NPV) is negative, the company should not purchase the machine.

iii) Computation of Profitability Index (PI) :

Profitability Index (PI) $= \frac{Sum\ of\ present\ value\ of\ net\ cash\ inflow}{Initial\ cash\ outflow}$

$= \frac{4,38,594+27,941}{5,00,000} = 0.93$

Since the Profitability Index is less than 1, the company should not purchase the machine.

QUESTION 22 : RTP - MAY 2024

HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of Rs.2,50,000 on 31st March. The machine has begun causing problems with breakdowns and it cannot fetch more than Rs. 40,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered Rs. 1,50,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of Rs. 6,00,000. The expected life of new machine is 10 years with salvage value of Rs. 35,000.

Further, the company follows written down value method depreciation @ 10% but for tax purpose, straight line method depreciation is used considering that this is the only machine in the block of assets. A working capital of Rs. 50,000 will be needed and it will be released at the end of tenth year.

Given below are the expected sales and costs from both old and new machine:

	Old machine	**New machine**
Annual output	60,000 units	80,000 Units
Selling price per unit	Rs. 18	Rs. 18
Annual operating hours	2,800	2,800
Material cost per unit	Rs. 5	Rs. 5
Labour cost per hour	Rs. 50	Rs. 75
Indirect cash cost per annum	Rs. 1,00,000	Rs. 1,75,000

From the above information, ANALYSE whether the old machine should be replaced or not if the opportunity cost of capital of the Company is 10%?

The Income tax rate is 30%. Further assume that book profit is treated as ordinary income for tax purpose.

Also ESTIMATE the internal rate of return of the replacement decision.

All calculations to be calculated to 3 decimal places.

SOLUTION :

(i) Initial Cash Outflow:

	Amount (Rs.)
Cost of new machine	6,00,000
Less: Sale Price of existing machine	1,05,000
Net of Tax (Rs. 1,50,000 × 0.70)	
	4,95,000

(ii) Terminal Cash Flows:

New Machine

	Amount (Rs.)
Salvage value of Machine	35,000
Less: Depreciated WDV {Rs. 6,00,000 - (Rs. 56,500 × 10 years)}	35,000
Short Term Capital Gain (STCG)	Nil
Tax	Nil

Net Salvage Value (cash flows)	35,000

(iii) Computation of additional cash flows (yearly)

Particulars	**Existing machine**	**New Machine**	**Incremental**
(1)	**(2)**	**(3)**	**(4) = (3) – (2)**
Annual output	60,000 units	80,000 units	20,000 units
	Rs.	Rs.	Rs.
(A) Sales revenue @ Rs. 18 per unit	10,80,000	14,40,000	3,60,000
(B) Less: Cost of Operation			
Material @ Rs. 5 per unit	3,00,000	4,00,000	1,00,000
Labour			
Old = 2,800 x Rs. 50	1,40,000		70,000
New = 2,800 x Rs. 75		2,10,000	
Indirect cash cost	1,00,000	1,75,000	75,000
Total Cost (B)	5,40,000	7,85,000	2,45,000
Profit Before Tax and depreciation (PBTD) (A – B)	5,40,000	6,55,000	1,15,000
Less: Depreciation $\left(\frac{6,00,000 - 35,000}{10}\right)$			56,500
Earning after depreciation before Tax			58,500
Less: Tax @30%			17,550
Earning after depreciation and Tax			40,950
Add: Depreciation			56,500
Net Cash inflow			97,450

Analysis: Since the Incremental Cash flow is positive, the old machine should be replaced.
Note: As mentioned in the question WDV of Machine is zero for tax purpose hence no depreciation shall be provided in existing machine.

(iv) Calculation of RS.

Computation of NPV @ 10%

	Period	**Cash flow (Rs.)**	**PVF @ 10%**	**PV (Rs.)**
Incremental cash flows	1-10	97,450	6.144	5,98,733
Add: Release of Working Capita	10	50,000	0.386	19,300
Add: Terminal year cash	10	35,000	0.386	13,510
				6,31,543
Less: Initial cash outflow	0	4,95,000	1	4,95,000
Less: Working capital	0	50,000	1	50,000
			NPV	86,543

Since NPV computed in Part (i) is positive. Let us discount cash flows at higher rate say at 20%

	Period	Cash flow (Rs.)	PVF @ 20%	PV (Rs.)
Incremental cash flows	1-10	97,450	4.192	4,08,510
Add: Release of Working Capital	10	50,000	0.162	8,100
Add: Terminal year cash	10	35,000	0.162	5,670
				4,22,280
Less: Initial cash outflow	0	4,95,000	1	4,95,000
Less: Working capital	0	50,000	1	50,000
			NPV	(1,22,720)

Now we use interpolation formula:

$$10\% + \frac{86,543}{86,543 - (-1,22,720)} \text{ X } 10\%$$

$$10\% + \frac{86,543}{2,09,263} \text{ X } 10\%$$

RS. = 10% + 4.14% = 14.14%

Summary of Results :

		Decision
Incremental Cash Flow	Rs. 97, 450	Accept
RS.	14.14% > Cost of Capital (10%)	Accept

QUESTION 23 : PAPER - MAY 2024

HCP Ltd. is a leading manufacturer of railway parts for passenger coaching and freight wagons. Due to high wastage of material and quality issues in production, the General Manager of the company is considering the replacement of machine A with a new CNC machine B. Machine A has a book value of Rs.4,80,000 and remaining economic life is 6 years. It could be sold now at Rs.1,80,000 and zero salvage value at the end of sixth year. The purchase price of Machine B is Rs.24,00,000 with economic life of 6 years. It will require Rs.1,40,000 for installation and Rs.60,000 for testing. Subsidy of 15% on the purchase price of the machine B will be received from Government at the end of 1st year. Salvage value at the end of sixth year will be Rs.3,20,000

The General manager estimates that the annual savings due to installation of machine B include a reduction of three skilled workers with annual salaries of Rs.1,68,000 each Rs.4,80,000 from reduced wastages of materials and defective and Rs.3,50,000 from loss in sales due to delay in execution of purchase orders. Operation of Machine B will required the services of a trained technician with annual salary of Rs.3,90,000 and annual operation and maintenance cost will increase by Rs.1,54,000. The company's tax rate is 30% and it's required rate of return is 14%. The company follows straight line method of depreciation. Ignore tax savings on loss due to sale of existing machine.

The present value factors at 14% are :

Years	0	1	2	3	4	5	6
PV Factor	1	0.877	0.769	0.675	0.592	0.519	0.456

Required :

(i) Calculate the Net Present Value and Profitability Index and advise the company for replacement decision.

(ii) Also calculate the discounted pay-back period.

Thanks ….

CHAPTER

9

DIVIDEND DECISIONS

QUESTION 1 : MTP - MAR 2018

A company had paid dividend of Rs. 2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. DETERMINE the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also COMPUTE the present market price of the share, given that the required rate of return of the equity investors is 15.5%.

SOLUTION :

In this case the company has paid dividend of Rs. 2 per share during the last year. The growth rate (g) is 5%. Then, the current year dividend (D_1) with the expected growth rate of 5% will be Rs. 2.10

The share price is = $P_o\ D1 = \frac{D_1}{K_e - g}$

$$\frac{Rs.2.16}{0.115 - 0.05} = 20$$

(i) In case the growth rate rises to 8% then the dividend for the current year (D_1) would be Rs. 2.16 and market price would be- = $\frac{Rs.2.16}{0.115 - 0.08} = \text{Rs. } 28.80$

(ii) In case growth rate falls to 3% then the dividend for the current year (D_1) would be Rs. 2.06 and market price would be

$$\frac{Rs.2.6}{0.115 - 0.03} = 16.48$$

So, the market price of the share is expected to vary in response to change in expected growth rate is dividends.

QUESTION 2 : MTP - OCT 2018 / MTP – MAR 2023

RST Ltd. has a capital of Rs. 10,00,000 in equity shares of Rs. 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs. 10 per share at the end of the

current financial year. The capitalization rate for the risk class of which the company belongs is 12%. COMPUTE the market price of the share at the end of the year, if

(i) a dividend is not declared?

(ii) a dividend is declared?

(iii) assuming that the company pays the dividend and has net profits of Rs.5,00,000 and makes new investments of Rs.10,00,000 during the period, how many new shares must be issued? Use the MM model.

SOLUTION :

As per MM model, the current market price of equity share is:

$$= p_0 \frac{1}{1 + k_e} \text{ x } (D_1 + P_1)$$

(i) If the dividend is not declared:

$$100 = \frac{1}{1 + 0.12} = (0 + P_1)$$

$$=100 = \frac{p_1}{1.12} = P1 = Rs.112$$

The Market price of the equity share at the end of the year would be Rs.112.

(ii) If the dividend is declared:

$$100 = \frac{1}{1 + 0.12} = (0+P1)$$

$$100 = \frac{10 + p_1}{1.12} \text{ x } (10+P1)$$

112 = 10 + P1

P_1 = 112 3 10 = Rs.102

The market price of the equity share at the end of the year would be Rs.102.

(iii) In case the firm pays dividend of Rs.10 per share out of total profits of Rs. 5,00,000 and plans to make new investment of Rs. 10,00,000, the number of shares to be issued may be found as follows:

Total Earnings	Rs. 5,00,000
- Dividends paid	(1,00,000)
Retained earnings	4,00,000
Total funds required	10,00,000
Fresh funds to be raised	6,00,000
Market price of the share	102

Number of shares to be issued (Rs.6,00,000 / 102) 5,882.35 or, the firm would issue 5,883 shares at the rate of Rs.102

QUESTION 3 : PAPER - NOV 2018

Following information relating to Jee Ltd. are given

Profit after tax	Rs 10,00,000
Dividend Payout Ratio	50%
Number of Equity shares	50,000
Cost of Equity	10%

Rate of Return on Investment 12%

1. What would be the market value per share as per Walters Model ?
2. What is the optimum dividend payout ratio according to walter's model and market value of equity at that payout ratio?

SOLUTION :

(i) Walter's model is given by –

$$P = \frac{D + (E - D)\,(r/K_e)}{K_e}$$

Where,

P = Market price per share,

E = Earnings per share = Rs.10,00,000 ÷ Rs.50,000 = Rs.20

D = Dividend per share = 50% of 20 = Rs.10

r = Return earned on investment = 12%

K_e = Cost of equity capital = 10%

$$\therefore P = \frac{10 + (20 - 10) \times \frac{0.12}{0.10}}{0.10} = \frac{22}{0.10} = \text{Rs.220}$$

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is Nil. So, at a payout ratio of zero, the market value of the company's share will be:-

$$P = \frac{0 + (20 - 10) \times \frac{0.12}{0.10}}{0.10} = \frac{24}{0.10} = \text{Rs.240}$$

QUESTION 4 : MAY 2019

The following information is supplied to you

Total Earnings	Rs. 40 Lakhs
No. of equity shares (of Rs. 100 each)	4,00,000
Dividend Per share	Rs. 4
Cost of capital	16%
Internal rate of return on investment	20%
Retention ratio	60%

Calculate the market price of a share of a capital by using :

(i) Walter's Formula

(ii) Gordon's Formula

SOLUTION :

$$\text{Earning Per Share (E)} = \frac{Rs.40\ Lakhs}{4,00,000} = \text{Rs. } 10$$

Calculation of Market price per share by

(i) **Walter's Formula :** Market Price (P) = $\frac{D+\frac{r}{K_e}(E-D)}{K_e}$

Where,

P = Market Price of the share
E = Earnings per share
D = Dividend per share
K_e = Cost of equity/ rate of capitalization/ discount rate.
R = Internal Rate of return / return on investment

P = $\frac{4+\frac{0.20}{0.16}(10-4)}{0.16} = \frac{4+7.5}{0.16} = Rs.71.88$

(ii) **Gordon's formulas :** When the growth is incorporated in earnings and dividend, the present value of market price per share (P_o) is determined as follows

Gordon's theory $P_0 = \frac{E(1-b)}{k-br}$

Where,

P_0 = Present market price per share
E = Earnings per share
b = Retention ratio (i.e % of earnings retained)
r = Internal rate of return (IRR)

Now $P_0 = \frac{10(1-.60)}{.16-(.60x20)} = Rs.\frac{4}{.04} = Rs.100$

QUESTION 5 : NOV 2019

Following figures and information were extracted from the company A Ltd

Earnings of the company	Rs. 10,00,000
Dividend paid	Rs. 6,00,000
No. of shares outstanding	2,00,000
Price earnings Ratio	10
Rate of return on investment	20%

You are required to calculate:

(i) Current Market Price of the share
(ii) Capitalization rate of its risk class
(iii) What should be the optimum payout ratio?
(iv) What should be the market price per share at optimal payout ratio? (Use Walter's Model)

SOLUTION :

i. Current Market Price of shares (applying Walter's Model)

- The EPS of the firm is Rs. 5 (i.e. Rs. 10,00,000/2,00,000)
- Rate of Return on Investment (r) = 20%

- The Price Earnings (P/E) Ratio is given as 10, so capitalization rate (K_e) may be taken at the inverse of P/E Ratio. Therefore K_e is 10% or .10 (i.e. 1/10).
- The firm is distributing total dividends of Rs. 6,00,000 among 2,00,000 shares, giving a dividend per share of Rs. 3

The value of the share as per Walter's model may be found as follows:
Walter's model is given by –

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,

P = Market price per share
E = Earnings per share = Rs 5
D = Dividend per share = Rs 3
R = Return earned on investment = 20%
K_e = Cost of equity capital = 10% or .10

$$P = \frac{3 + \frac{0.20}{0.10}(5 - 3)}{0.10} = Rs.70$$

Current Market Price of shares can also be calculated as follows:

$$\text{Price Earnings (P/E) Ratio} = \frac{Market \text{ Price of Share}}{Earnings \text{ Per Shares}}$$

$$\text{Or, } 10 = \frac{Market \text{ Price of Share}}{Rs.10,00,000 / 2,00,000}$$

$$\text{0r, } 10 = \frac{Market \text{ Price of Share}}{Rs.5}$$

Market Price of Share = Rs. 50

(ii) **Capitalization rate** (K_e) of its risk class is 10% or .10 (i.e. 1/10)

(iii) **Optimum dividend pay-out ratio**
According to Walter's model when the return on investment is more than the cost of equity capital (10%), the price per share increases as the dividend pay-out ratio decreases. Hence the optimum dividend pay-out ratio in this case is nil or 0 (zero).

(iv) **Market price per share at optimum dividend pay-out ratio**
At a pay-out ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + \frac{0.20}{0.10}(5 - 0)}{0.10} = Rs.100$$

QUESTION 6 : NOV 2020

The following figures are extracted from the annual report of RJ Ltd:
Net Profit Rs. 50 Lakhs

Outstanding 13% preference shares	Rs. 200 Lakhs
No. of Equity Shares	6 Lakhs
Return on Investment	25%
Cost of Capital (K_e)	15%

You are required to compute the approximate dividend pay-out ratio by keeping the share price at Rs. 40 by using Walter's Model.

SOLUTION :

Particulars	**Rs. In lakhs**
Net Profit	50
Less : Preference dividend (Rs. 200,00,000 x 13%)	26
Earnings for equity shareholders	24
Therefore, earnings per share = Rs. 24 lakh / 6 lakh shares = Rs. 4	

Let, the dividend per share be D to get share price of Rs. 40

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$Rs.40 = \frac{D + \frac{0.25}{0.15}(Rs.\ 4 - D)}{0.15}$$

$$6 = \frac{0.15D + 1 - 0.25D}{0.15}$$

$$0.1\ D = 1 - 0.9$$

$$D = Rs.1$$

$$D/P\ ratio = \frac{DPS}{EPS} \times 100 = \frac{Rs.1}{Rs.4} \times 100 = 25\%$$

So, the required dividend pay-out ratio will be = 25%

QUESTION 7 :

XYZ is a company having share capital of Rs. 10 lakhs of Rs. 10 each. It distributed current dividend of 20% per annum. Annual growth rate in dividend expected is 2%. The expected rate of return on its equity capital is 15%. CALCULATE price of share applying Gordon's growth Model.

SOLUTION :

$$P = \frac{D_0(1+g)}{K_e - g}$$

$$= \frac{2(1+0.02)}{0.15 - 0.02} = Rs.15.69$$

QUESTION 8 : JAN 2021

The following information is taken from ABC Ltd

Net Profit for the year	Rs. 30,00,000
12% Preference share capital	Rs. 1,00,00,000
Equity share capital (Share of Rs. 10 each)	Rs. 60,00,000
Internal Rate of return on investment	22%
Cost of Equity Capital	18%
Retention Ratio	75%

Calculate the market price of the share using:

(i) Gordon's Model

(ii) Walter's Model

SOLUTION :

Market price per share by –

(1) Gordon's Model :

Present market price per share $(P_0)^* = \frac{D_o\,(1+g)}{K_e - g}$

OR

Present market price per share $(P_0)^* = \frac{D_1}{K_e - g}$

Where,

P_o = Present market per share.

g = Growth rate (br) = 0.75 x 0.22 = 0.165

b = Retention ratio (i.e., % of earnings retained)

r = Internal rate of return (IRR)

D_o = E x (1 – b) = 3 x (1 – 0.75) = 0.75

E = Earnings per share

$P_0 = \frac{0.75\,(1+0.165)}{0.18 - 0.165} = \frac{0.874}{0.015}$ = Rs. 58.27 approx.

* Alternatively, P_o can be calculated as $\frac{E(1-b)}{k - br}$ = Rs. 50

(2) Walter's Model:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$= \frac{0.75 + \frac{0.22}{0.18}(3 - 0.75)}{0.18} = \text{Rs. } 19.44$$

Workings

1. Calculation of Earnings per share

Particulars	Amount
Net Profit for the year	30,00,000
Less : Preference dividend (12% of Rs. 1,00,00,000)	(12,00,000)
Earnings for equity shareholders	18,00,000
No. of equity shares (Rs. 60,00,000 / Rs. 10)	6,00,000
Therefore, Earnings per share $\left(\frac{Earnings \text{ for equity shareholders}}{No. \text{ of equity shares}}\right)$	Rs.18,00,000/6,00,000 = Rs. 3.00

2. Calculation of Dividend per share

Particulars	Amount
Earnings per share	Rs. 3
Retention Ratio (b)	75%
Dividend pay-out ratio (1-b)	25%
Dividend per share (Earnings per share x Dividend pay-out ratio)	Rs. 3 x 0.25 = Rs. 0.75

QUESTION 9 : PAPER - JULY 2021

The following information relates to LMN Ltd

Earnings of the company	Rs. 30,00,000
Dividend pay-out ratio	60%
No. of shares outstanding	5,00,000
Rate of return on investment	15%
Equity capitalized rate	13%

Required :

(i) Determine what would be the market value per share as per Walter's model.

(ii) Compute optimum dividend pay out ratio according to Walter's model and the market value of company's share at that pay-out ratio

SOLUTION :

(i) Calculation of market value per share as per Walter's model

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,

P = Market price per share

E = Earnings per share = Rs. 30,00,000/5,00,000 = Rs. 6

D = Dividend per share = Rs. 6 x 0.60 = Rs. 3.6

r = Return earned on investment = 15%

K_e = Cost of equity capital = 13%

$$P = \frac{3.6 + \frac{0.15}{0.13}(6 - 3.6)}{0.13} \text{ Rs. } 49$$

(ii) According to Walter's model, when the return on investment (r) is more than the cost of equity capital (K_e), the price per share increases as the dividend pay – out ratio decreases.

Hence, the optimum dividend pay-out ratio in this case is nil.

So, at a pay-out ratio of zero, the market value of the company's share will be :

$$P = \frac{0 + \frac{0.15}{0.13}(6 - 0)}{0.13} \text{ Rs. } 53.254$$

QUESTION 10 : RTP - MAY 2022

The following figures have been collected from the annual report of ABC Ltd. for the current financial year:

Net Profit	Rs. 75 lakhs
Outstanding 12% preference shares	Rs. 250 lakhs
No. of equity shares	7.50 lakhs
Return on Investment	20%
Cost of capital i.e. (Ke)	16%

(a) COMPUTE the approximate dividend pay-out ratio so as to keep the share price at Rs. 42 by using Walter's model?

(b) DETERMINE the optimum dividend pay-out ratio and the price of the share at such pay-out.

(c) PROVE that the dividend pay-out ratio as determined above in (b) is optimum by using random pay-out ratio.

SOLUTION :

	Rs. in lakhs
Net Profit	75
Less : Preference Dividend	30
Earning for equity shareholders	45
Earning per share	= 45/7.5 = Rs. 6.00

(a) Let, the dividend per share be D to get share price of Rs. 42

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$Rs.42 = \frac{D + \frac{0.20}{0.16}(6 - D)}{0.16}$$

$$6.72 = \frac{0.16D + 1.2 - 0.20D}{0.16}$$

0.04D = 1.2 3 1.0752

D = 3.12

$$D/P\ ratio = \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$$

So, the required dividend payout ratio will be = 52%

(b) Since r > K_e, the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0), Accordingly, value of a share:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$P = \frac{0 + \frac{0.20}{0.16}(6 - 0)}{0.16} = \text{Rs. } 46.875$$

(c) The optimality of the above pay-out ratio can be proved by using 25%, 50%, 75% and 100% as pay- out ratio:

At 25% pay-out ratio

$$P = \frac{1.5 + \frac{0.20}{0.16}(6 - 1.5)}{0.16} = \text{Rs. } 44.531$$

At 50% pay-out ratio

$$P = \frac{3 + \frac{0.20}{0.16}(6 - 3)}{0.16} = \text{Rs. } 42.188$$

At 75% pay-out ratio

$$P = \frac{4.5 + \frac{0.20}{0.16}(6 - 4.5)}{0.16} = \text{Rs. } 39.844$$

At 100% pay-out ratio

$$P = \frac{6 + \frac{0.20}{0.16}(6 - 6)}{0.16} = \text{Rs. } 37.50$$

From the above it can be seen that price of share is maximum when dividend pay-out ratio is 'zero' as determined in (b) above.

QUESTION 11 :

Ltd. is a no growth company, pays a dividend of Rs. 5 per share. If the cost of capital is 10%, COMPUTE the current market price of the share?

SOLUTION :

$P_0 = \frac{D}{K_e} = \frac{5}{0.10} = Rs.50$

QUESTION 12 : PYP - MAY 2023

(a) Following information are given for a company:

Earnings per share	Rs. 10
P/E ratio	12.5
Rate of return on investment	12%
Market price per share as per Walter's Model	Rs. 130

You are required to calculate:

(i) Dividend payout ratio.

(ii) Market price of share at optimum dividend payout ratio.

(iii) P/E ratio, at which the dividend policy will have no effect on the price of share.

(iv) Market price of share at this P/E ratio.

(v) Market price of share using Dividend growth model.

SOLUTION :

i) The EPS of the firm is Rs. 10, r =12%. The P/E Ratio is given at 12.5 and the cost of capital (Ke) may be taken as the inverse of P/E ratio. Therefore, Ke is 8% (i.e., 1/12.5). The value of the share is Rs. 130 which may be equated with Walter Model as follows:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} \text{ or } P = \frac{D + \frac{12}{8\%}(10 - D)}{8\%}$$

or [D+1.5(10-D)]/0.08=130
or D+15-1.5D=10.4
or -0.5D=-4.6
So, D = Rs. 9.2
The firm has a dividend pay-out of 92% (i.e., 9.2/10).

ii) Since the rate of return of the firm (r) is 12% and it is more than the Ke of 8%, therefore, by distributing 92% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be:

$$P = \frac{0 + \frac{12}{8\%}(10 - 0)}{8\%}$$

P = Rs. 187.5

So, theoretically the market price of the share can be increased by adopting a zero pay-out.

iii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the Ke would be equal to the rate of return (r) of the firm. The Ke would be 12% (= r) at the P/E ratio of 1/12%=8.33. Therefore, at the P/E ratio of 8.33, the dividend policy would have no effect on the value of the share.

iv) If the P/E is 8.33 instead of 12.5, then the Ke which is the inverse of P/E ratio, would be 12% and in such a situation ke= r and the market price, as per Walter9s model would be:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{9.2 + \frac{0.12}{0.12}(10 - 9.2)}{0.12} = 83.33$$

v) Dividend Growth Model applying growth on dividend

Ke = 8%, r = 12%, D0 = 9.2, b = 0.08

g = b.r

g = 0.08 x 0.12=0.96%

$D_1 = D_0$ (1+g) = 9.2 (1+0.0096) = Rs. 9.2883

$$P = \frac{D_1}{(K_e - g)} = 9.2883/(0.08 - 0.0096) = 9.2883/0.0704 = \text{Rs. } 131.936$$

Alternative Alternatively, without applying growth on dividend

$$P = \frac{E(1 - b)}{K_e - b_r} = \frac{10(1 - 0.08)}{0.08 - (0.08 \text{ x } 0.12)} = 130.68$$

QUESTION 13 : MPT - OCT 2023

A&R Ltd. is a large-cap multinational company listed in BSE in India with a face value of Rs. 100 per share. The company is expected to grow @ 15% p.a. for next four years then 5% for an indefinite period. The shareholders expect 20% return on their share investments. Company paid Rs. 120 as dividend per share for the FY 2020-21. The shares of the company traded at an average price of Rs. 3,122 on last day. FIND out the intrinsic value of per share and state whether shares are overpriced or underpriced.

SOLUTION :

As per Dividend discount model, the price of share is calculated as follows:

$$P = \frac{D_1}{(1 + K_e)^1} + \frac{D_2}{(1 + K_e)^2} + \frac{D_3}{(1 + K_e)^3} + \frac{D_4}{(1 + K_e)^4} + \frac{D_5}{(1 - g)} + \frac{1}{(1 + K_e)^4} +$$

P = Price per share

K_e = Required rate of return on equity

g = Growth rate

$$= \frac{Rs.120 \text{ x } 1.15}{(1+0.2)^1} + \frac{Rs.138 \text{ x } 1.15}{(1+0.2)^2} + \frac{Rs.158 \text{ x } 1.15}{(1+0.2)^3} + \frac{Rs.182 \text{ x } 1.15}{(1+0.2)^4} + \frac{Rs.209.88 \text{ x } 1.05}{(0.2+0.05)} + \frac{1}{(1+0.2)^4}$$

P= 115 + 110.2 + 105.6 + 101.2 + 708.50 = Rs. 1,140.50

Intrinsic value of share is Rs. 1,140.50 as compared to latest market price of Rs. 3,122. Market price of a share is overpriced by Rs. 1,981.50

QUESTION 14 : PAPER - NOV 2023

(i) EPS of a company is Rs. 60 and Dividend payout ratio is 60%. Multiplier is 5. Determine price per share as per Graham & Dodd model.

(ii) Last year's dividend is Rs. 6.34, adjustment factor is 45%, target payout is 60% and current year's EPS is Rs. 12. Compute current year's dividend using Linter's model.

SOLUTION :

(I) Price Per Share (P) : $m\left\{D + \frac{E}{3}\right\}$

Where,

m = Multiplier

D = Dividend

E = EPS

P = $5\ \{60 \times 0.6 + \frac{60}{3}\}$

P = 5 {36 + 20} = 280

(II) D_1 = D_0 + [(EPS × Target Payout) – D_0] × Adjustment factor

D_1 = 6.34 + {(12 × 60%) – 6.34 } × 0.45

D_1 = 6.34 + 0.387 = 6.727

QUESTION 15 : PAPER - NOV 2023

INFO Ltd is a listed company having share capital of Rs. 2400 crores of Rs, 5 each.

During the year 2022-23

Dividend distributed	1000%
Expected Annual growth rate in dividend	14%
Expected rate of return on its equity capital	18%

Required

a. Calculate price of share applying Gordon's growth Model

b. What will be the price of share if the Annual growth rate in dividend is only 10%?

c. According to Gordon's growth model, if Internal Rate of Return is 25% than what should be the optimum dividend payout ratio in case of growing stage of company? Comment

SOLUTION :

(a) In the present situation , the current MPS is as Follow :

$$P = \frac{D_0\ (1+g)}{K_e - g}$$

Where ,

P = Market price per share

D_0 = Current year dividend

G = Growth rate of dividends

K_e = Cost of equity capital / expected rate of return

P = $\frac{50\ (1+0.14)}{0.18-0.14} = 1425$

(b) the impact of change in growth rate to 10% on MPS will be as follow :

P = $\frac{50\ (1+0.10)}{0.18-0.10} = 687.5$

(c) If internal rate of return , r= 25% and Ke = 18%

As per Gordon's model , when r > Ke , optimum dividend payout ratio is Zero when IRR is greater then cost of capital , the price per share increases and dividend pay out decreases.

QUESTION 16 : RTP - MAY 2024

MCO Ltd. has a paid-up share capital of Rs. 10,00,000, face value of Rs. 10 each. The current market price of the shares is Rs. 20 each. The Board of Directors of the company has an agenda of meeting to pay a dividend of 25% to its shareholders. The company expects a net income of Rs. 5,20,000 at the end of the current financial year. Company also plans for a capital expenditure for the next financial year for a cost of Rs. 7,50,000, which can be financed through retained earnings and issue of new equity shares.

Company's desired rate of investment is 15%.

Required:

Following the Modigliani - Miller (MM) Hypothesis, DETERMINE value of the company when:

(i) It does not pay dividend and

(ii) It does pay dividend

SOLUTION :

As per MM Hypothesis, value of firm/ company is calculated as below:

$$Vf \text{ or } nP_0 = \frac{(n+\Delta n)P_1 - I + E}{(1+K_e)}$$

Where,

V_f = Value of firm in the beginning of the period

n = number of shares in the beginning of the period

Δn = number of shares issued to raise the funds required

I = Amount required for investment

E = total earnings during the period

(i) Value of the ZX Ltd. when dividends are not paid.

$$nP_0 = \frac{(n+\Delta n)P_1 - I + E}{(1+K_e)}$$

$$nP_0 = \frac{(1,00,000 + \frac{2,30,000}{23}) \text{ x Rs. } 23 - \text{Rs. } 7,50,000 + \text{Rs. } 5,20,000}{(1+\ 0.15)}$$

$$= \frac{Rs.\ 25,30,000 - Rs.\ 7,50,000 + Rs.\ 5,20,000}{(1 + 0.15)} = Rs.\ 20,00,000$$

Working notes:

1. Price of share at the end of the period (P_1)

$$(P_0) = \frac{P_1 + D_1}{1 + K_e}$$

$$20 = \frac{P_1 + 0}{1 + 0.15} \text{ or } P_1 = Rs.\ 23$$

2. Calculation of funds required for investment

Earnings	Rs. 5,20,000
Dividend distributed	NIL
Fund available for investment	Rs. 5,20,000
Total Investment	Rs. 7,50,000
Balance Funds required	Rs. 2,30,000

3. Calculation of no. of shares required to be issued for balance fund

$$No.\ \text{of shares}\ (\Delta n) = \frac{Funds\ \text{required}}{Price\ \text{at end}\ (P_1)} = \frac{2,30,000}{23}\ shares$$

(ii) Value of the ZX Ltd. when dividends are paid.

$$nP_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_0 = \frac{\left(1,00,000 + \frac{4,80,000}{20.5}\right) X\ Rs.\ 20.5 - Rs.\ 7,50,000 + Rs.\ 5,20,000}{(1 + 0.15)}$$

$$= \frac{Rs.\ 25,30,000 - Rs.\ 7,50,000 + Rs.\ 5,20,000}{(1 + 0.15)} = Rs.\ 20,00,000$$

Working notes:

4. Price of share at the end of the period (P_1)

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$20 = \frac{P_1 + 2.5}{1 + 0.15} \text{ or } P_1 = Rs.\ 20.5$$

5. Calculation of funds required for investment

Earnings	Rs. 5,20,000
Dividend distributed	Rs. 2,50,000
Fund available for investment	Rs. 2,70,000
Total Investment	Rs. 7,50,000
Balance Funds required	Rs. 4,80,000

6. Calculation of no. of shares required to be issued for balance fund

$$No.\ \text{of shares}\ (\Delta n) = \frac{Funds\ \text{required}}{\text{Pr}ice\ \text{at end}\ (P_1)} = \frac{4,80,000}{20.5}$$

= 23,415 shares(approx.)

Note - As per MM - hypothesis of dividend irrelevance, value of firm remains same irrespective of dividend paid. In the solution, there may be variation in value, which is due to rounding off error.

QUESTION 17 : PAPER - MAY 2024

Vista Limited's retained earnings per share for the year ending 31.03.2023 being 40% is Rs.3.60 per share. Company is foreseeing a growth rate of 10% per annum in the next two years. After that the growth rate is expected to stabilizes at 8% per annum. Company will maintain its existing pay-out ratio. If the investor's required rate of return is 15%, calculate the intrinsic value per share as of date using Dividend Discount model.

Thanks ….

CHAPTER

10

ESTIMATED WORKING CAPITAL MANAGEMENT

QUESTION 1 : MAY 2018

Day Ltd. a newly formed company has applied to the private Bank for the first time for financing its working capital requirements. The following information are available about the projections for the current year.

Estimated Level of Activity	Completed units of production 31,200 plus. Units of work in progress 12,000
Raw material cost	Rs 40 per unit
Direct Wages cost	Rs 15 per unit
Overhead	Rs 40 per unit (including Dep of Rs 10 per unit)
Selling Price	Rs 130 per unit
Raw material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods stock	24,000 units
Credit Allowed by the supplier	30 days
Credit allowed to purchasers	60 days
Direct Wages (Lag in Payment)	15 days
Expected Cash Balance	Rs 2,00,000

Assume that production is carried on evenly through out the year (360 days) and wages and overheads accrue similarly. All sales are on the credit basis. You are required to calculate the Net working Capital Requirement on Cash Cost Basis.

SOLUTION :

Calculation of Net Working Capital requirement:

	Rs.	Rs.
A. Current Assets:		
Inventories:		
Stock of Raw material (Refer to Working note (iii)	1,44,000	

Stock of Work in progress (Refer to Working note	7,50,000	
Stock of Finished goods (Refer to Working note (iv)	20,40,000	
Debtors for Sales(Refer to Working note (v)	1,02,000	
Cash	2,00,000	
Gross Working Capital	32,36,000	32,36,000
B. Current Liabilities:		
Creditors for Purchases (Refer to Working note (vi)	1,56,000	
Creditors for wages (Refer to Working note (vii)	23,250	
	1,79,250	1,79,250
Net Working Capital (A - B)		**30,56,750**

Working Notes:

(i) Annual cost of production

	Rs.
Raw material requirements {(31,200 × Rs. 40) + (12,000 x Rs. 40)}	17,28,000
Direct wages {(31,200 ×Rs. 15) +(12,000 X Rs. 15 x 0.5)}	5,58,000
Overheads (exclusive of depreciation) {(31,200 × Rs. 30) + (12,000 x Rs. 30 x 0.5)}	11,16,000
Gross Factory Cost	34,02,000
Less: Closing W.I.P [12,000 (Rs. 40 + Rs. 7.5 + Rs.15)]	(7,50,000)
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods (Rs. 26,52,000 × 24,000/31,200)	(20,40,000)
Total Cash Cost of Sales*	6,12,000

[*Note: Alternatively, Total Cash Cost of Sales = (31,200 units – 24,000 units) x (Rs. 40 + Rs. 15 + Rs. 30) = Rs. 6,12,000]

(ii) Work in progress stock

	Rs.
Raw material requirements (12,000 units × Rs.40)	4,80,000
Direct wages (50% × 12,000 units × Rs. 15)	90,000
Overheads (50% × 12,000 units × Rs. 30)	1,80,000
	7,50,000

(iii) Raw material stock

It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year. Hence, the raw material consumption for the year (360 days) is as follows:

	Rs.
For Finished goods (31,200 × Rs. 40)	12,48,000

For Work in progress (12,000 × Rs. 40)	4,80,000
	17,28,000

Raw material stock = $\frac{Rs.17,28,000}{360 days}$ × 30 days = Rs1,44,000

(iv) Finished goods stock:

24,000 units @ Rs. (40 + 15 + 30) per unit = Rs.20,40,000

(v) Debtors for sale: Rs.6,12,000 × $\frac{60 days}{360 days}$ = Rs.1,02,000

(vi) Creditors for raw material Purchases [Working Note (iii)]:

Annual Material Consumed (Rs.12,48,000 + Rs.4,80,000)	Rs.17,28,000
Add: Closing stock of raw material [(Rs.17,28,000 x 30 days) / 360 days]	Rs. 1,44,000
	Rs.18,72,000

Credit allowed by suppliers = $\frac{Rs.18,72,000}{360 days}$ × 30 days= Rs. 1,56,000

(vii) Creditors for wages:

Outstanding wage payment = [(31,200 units x Rs. 15) + (12,000 units x Rs. 15 x .50)] x 15 days / 360 days

= $\frac{Rs.5,58,000}{360 days}$ × 15 days = Rs. 23,250

QUESTION 2 : MAY 2019

Bita Ltd manufactures used in the steel industry. The following information regarding the company is given for your consideration:

i. Expected level of production 9000 units per annum
ii. Raw materials are expected to remain in store for an average of two months before issue to production
iii. Work-in-progress (50 percent complete as to conversion cost) will approximate to ½ month's production
iv. Finished goods remain in warehouse on an average for one month
v. Credit allowed by suppliers in one month.
vi. Two month's credit is normally allowed to debtors
vii. A minimum cash balance of Rs. 67,500 is expected to be maintained
viii. Cash sales are 75 percent less than the credit sales
ix. Safety margin of 20 percent to cover unforeseen contingencies
x. The production pattern is assumed to be even during the year.
xi. The cost structure for Bita Limited's product is as follows

	Rs.
Raw Materials	80 Per Unit
Direct Labour	20 Per Unit
Overheads (including depreciation Rs.20)	80 Per Unit
Total Cost	180 Per Unit
Profit	20 Per Unit
Selling Price	200 Per Unit

You are required to estimate the working capital requirement of Bita Limited

SOLUTION :

Statement showing Estimate of Working Capital Requirement

	(Amount In Rs)	(Amount in Rs)
A. Current Assets		
(i) Inventories :		
- *Raw* material inventory $\left(\frac{9,000 \text{ units x Rs. } 80}{12 months} \text{ x 2 months}\right)$		1,20,000
- Work in Progress:		
Raw material inventory $\left(\frac{9,000 \text{ units x Rs. } 80}{12 months} \text{ x 0.5 months}\right)$	30,000	
Wages $\left(\frac{9,000 \text{ units x Rs. } 20}{12 months} \text{ x 0.5 months}\right)$ x 50%	3,750	
Overheads $\left(\frac{9,000 \text{ units x Rs. } 60}{12 months} \text{ x 0.5 months}\right)$ x 50% (Other than Depreciation)	11,250	**45,000**
Finished goods (inventory held for 1 months)		**1,20,000**
(ii) Debtors (for 2 months) $\left(\frac{9,000 \text{ units x Rs. } 160}{12 \text{ months}} \text{ x 2month}\right)$ x 80% or $\left(\frac{11,52,000}{12 \text{ months}} \text{ x 2 month}\right)$		**1,92,000**
(iii) Cash balance expected		**67,500**
Total Current assets		**5,44,500**
B. Current Liabilities		
(i) Creditors for Row material (1month) $\left(\frac{9,000 \text{ units x Rs.80}}{12 \text{ months}} \text{ x 1 month}\right)$		**60,000**
Total current liabilities		**60,000**
Net working capital (A-B)		**4,84,500**
Add : Safety margin of 20 percent		**96,900**
Working capital Requirement		**5,81,400**

Working notes

1. If Credit Sales is x then cash sales is x-75% of x i.e. x/4.
   Or x + 0.25x = Rs. 18,00,000
   Or x = Rs. 14,40,000
   So, credit Sales is Rs. 14,40,000
   Hence, Cash cost of credit sales $\left(\frac{Rs.14,40,000}{5} \text{ x 4}\right)$ = Rs. 11,52,000

2. It is assumed that safety margin of 20% is on net working capital
3. No information is given regarding lag in payment of wages, hence ignored assuming it is paid regularly.
4. Debtors/Receivables is calculated based on total cost.
   [If Debtors/Receivables is calculated based on sales, then debtors will be
   $\left(\frac{9,000 \text{ units x Rs. } 200}{12 \text{ months}} \text{ x } 2\text{month}\right) \text{ x } 80\% \text{ or } \left(\frac{14,40,000}{12 \text{ months}} \text{ x } 2 \text{ month}\right) = \text{Rs. } 2,40,000$
   Then Total Current Assets will be **Rs. 5,92,500** and accordingly Net Working capital and Working capital requirement will be **Rs. 5,32,500** and **Rs. 6,39,000** respectively.

QUESTION 3 : NOV 2020

PK Ltd. a manufacturing company, provides the following information:

	Rs.
Sales	1,08,00,000
Raw Material Consumed	27,00,000
Labour Paid	21,60,000
Manufacturing Overhead (Including Depreciation for the year Rs. 3,60,000)	32,40,000
Administrative & Selling Overhead	10,80,000

Additional Information

a. Receivables are allowed 3 months' credit.
b. Raw Material Supplier extended 3 months' credit.
c. Lag in payment of Labour is 1 month
d. Manufacturing Overhead are paid one month in arrear.
e. Administrative & selling overhead is paid 1 month advance.
f. Inventory holding period of Raw Material & Finished Goods are of 3 months
g. Work-in-Progress is Nil.
h. PK Ltd sells goods at cost plus $33\frac{1}{3}\%$
i. Cash Balance Rs. 3,00,000
j. Safety Margin 10%

You are required to compute the Working Capital Requirements of PK Ltd. on Cash Cost basis.

SOLUTION :

Statement showing the requirements of Working Capital (Cash Cost basis)

Particulars	Rs.	Rs.
A. **Current Assets :**		
Inventory		
Stock of Raw material (Rs. 27,00,000 x 3/12)	6,75,000	
Stock of Finished goods (Rs. 77,40,000 x 3/12)	19,35,000	
Receivables (Rs. 88,20,000 x 3/12)	22,05,000	
Administrative and Selling Overheads (Rs. 10,80,000 x 1/12)	90,000	

Cash in Hand	3,00,000	
Gross Working Capital	52,05,000	**52,05,000**
B. **Current Liabilities**		
Payables for Raw materials * (Rs. 27,00,000 x 3/12)	6,75,000	
Outstanding Expenses :		
Wages Expenses (Rs. 21,60,000 x 1/12)	1,80,000	
Manufacturing Overheads (Rs. 28,80,000 x /1/12)	2,40,000	
Total Current Liabilities	10,95,000	10,95,000
Net Working Capital (A – B)		**41,10,000**
Add : Safety margin @ 10%		4,11,000
Total Working Capital requirements		**45,21,000**

Working notes:

(i)

(A) Computation of Annual Cash Cost of Production	**Rs.**
Raw Material consumed	27,00,000
Wages (Labour paid)	21,60,000
Manufacturing overhead (Rs. 32,40,000 – Rs. 3,60,000)	28,80,000
Total cash cost of production	77,40,000
(B) Computation of Annual Cash Cost of Sales	**Rs.**
Cash cost of production as in (A) above	77,40,000
Administration & Selling overhead	10,80,000
Total cash cost of sales	88,20,000

* Purchase of Raw Material can also be calculated by adjusting Closing Stock and Opening Stock (assumed nil). In that case Purchase will be Raw Material consumed + Closing Stock – Opening Stock i.e. Rs. 27,00,000 + Rs. 6,75,000 – Nil = Rs. 33,75,000. Accordingly, Total Working Capital requirements (Rs. 43,35,375) can be calculated.

QUESTION 4 : JAN 2021

The following information is provided by MNP Ltd for the year ending 31st March 2020

Raw Material Storage Period	45 days
Work – in Progress conversion period	20 days
Finished Goods storage period	25 days
Debt Collection Period	30 days
Creditors payment period	60 days
Annual operating cost	Rs. 25,00,000

(Including Depreciation of Rs. 2,50,000)

Assume 360 days in a year

You are required to calculate :

Operating Cycle period

Number of Operating Cycle in a year

Amount of working capital required for the company on a cost basis

The company is market leader in its product and it has no competitor in the market. Based on a market survey it is planning to discontinue sales on credit and deliver products based on pre-payments in order to reduce its working capital requirement substantially. You are required to compute the reduction in working capital requirement in such a scenario.

SOLUTION :

(i) Calculation of Operating Cycle Period:

Operating Cycle Period = R + W+ F + D - C

= 45 + 20 + 25 + 30 – 60 = **60 days**

(ii) Number of Operating Cycle in a Year

$$= \frac{360}{Operating \text{ cycle period}} = \frac{360}{60} = 6$$

(iii) Amount of Working Capital Required

$$= \frac{Annual \text{ operating cost}}{Number \text{ of operating cycle}} = \frac{Rs.\ 25,00,000 - Rs.\ 2,50,000}{6}$$

$$= \frac{Rs.\ 22,50,000}{6} = Rs.\ 3,75,000$$

(iv) Reduction in Working Capital

Operating Cycle Period = R + W+ F + D - C

= 45 + 20 + 25 – 60 = 30 Days

Amount of Working Capital Required = $\frac{Rs.\ 22,50,000}{360} \times 30 = Rs.\ 1,87,500$

Reduction in Working Capital = Rs. 3,75,000 – Rs. 1,87,500 = Rs. 1,87,500

Note : If we use Total Cost basis, then amount of Working Capital required will be Rs. 4,16,666.67 (approx.) and Reduction in Working Capital will be Rs. 2,08,333.33 (approx.)

QUESTION 5 : PAPER MAY 2022

Balance Sheet of X Ltd for the year ended 31st March 2022 is given below

(Rs. In Lakhs)

Liabilities	Amount	Assets	Amount
Equity Shares Rs. 10 each	200	Fixed Assets	500
Retained earnings	200	Raw Materials	150
11% Debentures	300	W.I.P.	100
Public deposits (Short-term)	100	Finished Goods	50
Trade Creditors	80	Debtors	125
Bills Payable	100	Cash/Bank	55
	980		980

Calculate the amount of maximum permissible bank finance under three methods as per Tandon Committee lending norms.

The total core current assets are assumed to be Rs. 30 Lakhs

SOLUTION :

Current Assets = 150 + 100 + 50 + 125 + 55 = Rs. 480 Lakhs

Current Liabilities = 100 + 80 + 100 = Rs. 280 Lakhs
Maximum Permissible Banks Finance under Tandon Committee Norms:

Method I
Maximum Permissible Bank Finance = 75% of (Current Assets – Current Liabilities)
= 75% of (480 - 280)
= Rs. 150 Lakhs

Method II
Maximum Permissible Bank Finance = 75% of Current Assets – Current Liabilities
= 75 % of 480 – 280
= Rs. 80 Lakhs

Method III
Maximum Permissible Bank Finance = 75% of (Current Assets – Core Current Assets) – Current Liabilities
= 75 % of (480 - 30) – 280
= Rs. 57.5 Lakhs

QUESTION 6 : NOV 2023

X Ltd has furnished following cost sheet of per unit cost:

Raw material cost	-	Rs. 150
Direct labour cost	-	Rs. 40
Overhead cost	-	Rs. 60
Total cost	-	Rs. 250
Profit	-	Rs. 50
Selling Price	-	Rs. 300

The company keep raw material in stock on an average for 2 months, work in progress on an average for 3 months and finished goods in stock on an average 1 month. The credit allowed by suppliers is 1.5 months and company allows 2 months credit to its debtors. The lag in payment of wages is 1 month and lag in payment of overhead expenses is 1.5 months. The company sells 25% of the output against cash and maintain cash in hand at bank put together at Rs. 1,50,000. Production is carried on evenly throughout the year and wages and overheads also similarly. Work is progress stock is 75% complete in all respects. Prepare statement showing estimate of working capital requirements to finance an activity level of 15,000 units of production.

SOLUTION :

Statement Showing Estimate of Working Capital Needs:
[receivables (Debtors) are calculated based on cost goods sold]

A	Current Assets		
(i)	Inventories :		
	Ram material (2 months) $\{\frac{15{,}000\ unit \times Rs.150}{12\ months} \times 2 months\}$	3,75,000	

	WIP Inventory (3 months) $\{\frac{15{,}000\ unit \times Rs.\ 250}{12\ months} \times 3\ months\} \times 0.75$	7,03,125	
	Finished goods inventory (1 months) $\{\frac{15{,}000\ unit \times Rs.\ 250}{12\ months} \times 1$ months $\}$	3,12,500	13,90,625
(ii)	Receivable (debtors) (2 months) $\{\frac{15{,}000\ unit \times Rs.\ 250}{12\ months} 2\ months\} \times 0.75$		4,68,750
(iii)	Cash and bank balance		1,50,000
	Total Current Assets		20,09,375
B	Current Liabilities :		
(i)	Payables (Creditors) for materials (1.5 months) $\{\frac{15{,}000\ unit \times Rs.\ 150}{12\ months} \times 1.5\ months\}$		2,81,250
(ii)	Outstanding wages (1 months) $\{\frac{15{,}000\ unit \times Rs.\ 40}{12\ months} \times 1\ months$		50,000
(iii)	Outstanding overheads (1.5 months) $\{\frac{15{,}000\ unit \times Rs.\ 60}{12\ months} \times 1.5\ months$		1,12,500
	Total Current Liabilities		4,43,750
	Net Working Capital needs (A – B)		15,65,625

QUESTION 7 : RTP - MAY 2024

PQ Ltd. has commenced new business segment in 2023-24. The following information has been ascertained for annual production of 25,000 units which is the full capacity.

	Cost per unit (Rs.)
Material	100
Labour and variable overhead expenses	50
Fixed manufacturing expenses	35
Depreciation	15
Selling expenses (80% variable)	10

In the first two years of operations, production and sales are expected to be as follows:

Year	**Production (No. of units)**	**Sales (No. of units)**
1	12,000	10,000
2	18,000	19,000

The selling price is expected to be Rs. 250 .

To assess the working capital requirements, the following additional information is available:

(a)	Stock of materials	2 months' average consumption
(b)	Debtors	1.5 month's average sales.
(c)	Cash balance	Rs. 50,000
(d)	Creditors for supply of materials	1 month's average purchase during the year.
(e)	Expenses	All expenses will be paid 1 month in advance during the year.

Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses.

The management is also of the opinion to make 10% margin for contingencies on computed figure and value the closing stock at cost of production.

PREPARE, for the two years:

(i) A projected statement of Profit/Loss (Ignoring taxation); and

(ii) A projected statement of working capital requirements on a cash cost basis.

SOLUTION :

PQ Limited
Projected Statement of Profit / Loss
(Ignoring Taxation)

	Year 1	**Year 2**
Production (Units)	12,000	18,000
Sales (Units)	10,000	19,000
	(Rs)	(Rs)
Sales revenue (A) (Sales unit × Rs. 250)	25,00,000	47,50,000
Cost of production:		
Materials cost (Units produced × Rs. 100)	12,00,000	18,00,000
Direct labour and variable expenses (Units produced × Rs. 50)	6,00,000	9,00,000
Fixed manufacturing expenses (Production Capacity: 25,000 units × Rs. 35)	8,75,000	8,75,000
Depreciation (Production Capacity: 25,000 units × Rs. 15)	3,75,000	3,75,000
Gross Factory Cost	**30,50,000**	**39,50,000**
Add: Opening W.I.P.	-	2,91,000
Less: Closing W.I.P.	2,91,000	3,99,000
Cost of goods produced	**27,59,000**	**38,42,000**
Add: Opening stock of finished goods (Year 1 : Nil; Year 2 : 2,000 units)	-	4,59,833
Cost of Goods available for sale (Year 1: 12,000 units; Year 2: 20,000 units)	27,59,000	43,01,833
Less: Closing stock of finished goods at average cost		
(year 1: 2000 units, year 2: 1000 units)	4,59,833	2,13,444

(Cost of Production × Closing stock/ units produced)		
Cost of Goods Sold	**22,99,167**	**40,88,389**
Add: Selling expenses – Variable (Sales unit × Rs. 8)	80,000	1,52,000
Add: Selling expenses -Fixed (25,000 units × Rs. 2)	50,000	50,000
Cost of Sales : (B)	24,29,167	42,90,389
Profit (+) / Loss (-): (A - B)	**70,833**	**4,59,611**

Working Notes:

Calculation of Stock of Work-in-progress

Particulars	**Year 1 Rs.**	**Year 2 Rs.**
Raw Material (material cost × 15%)	1,80,000	2,70,000
Labour & Mfg. Expenses (Labour & mfg. expenses × 15% × 40%)	88,500	1,06,500
Depreciation (Depreciation × 15% × 40%)	22,500	22,500
Total	2,91,000	3,99,000

1. Calculation of creditors for supply of materials:

	Year 1 Rs	**Year 2 Rs.**
Materials consumed during the year	12,00,000	18,00,000
Add: Closing stock (2 month's average consumption)	2,00,000	3,00,000
	14,00,000	21,00,000
Less: Opening Stock	-	2,00,000
Purchases during the year	14,00,000	19,00,000
Average purchases per month (Creditors)	1,16,667	1,58,333

2. Prepayment for expenses:

	Year 1 Rs	**Year 2 Rs.**
Direct labour and variable expenses	6,00,000	9,00,000
Fixed manufacturing expenses	8,75,000	8,75,000
Selling expenses (variable + fixed)	1,30,000	2,02,000
Total	16,05,000	19,77,000
Average per month	1,33,750	1,64,750

(ii) Projected Statement of Working Capital Requirement (Cash Cost Basis)

	Year 1 Rs	**Year 2 Rs.**
(A) Current Assets		
Inventories:		
- Stock of Raw Material		

(12,000 units Rs. 100 2/12); (18,000 units Rs. 100 2/12)	2,00,000	3,00,000
- Finished Goods (Refer working note 3) - Work In Process (Refer working note 5)	4,01,083 2,68,500	1,92,611 3,76,500
Receivables (Debtors) (Refer working note 4)	2,66,927	4,84,684
Prepayment for Expenses (Refer working note 2)	1,33,750	1,64,750
Minimum Cash balance	50,000	50,000
Total Current Assets/ Gross working capital (A)	13,20,260	15,68,545
(B) Current Liabilities		
Creditors for raw material (Refer working note 1)	1,16,667	1,58,333
Total Current Liabilities	1,16,667	1,58,333
Net Working Capital (A – B)	12,03,594	14,10,212
Add: 10% contingency margin	1,20,359	1,41,021
Total Working capital required	**13,23,953**	**15,51,233**

Working Note:

3. Cash Cost of Production:

	Year 1 Rs	**Year 2 Rs.**
Gross Factory Cost as per projected Statement of P&L	30,50,000	39,50,000
Add: Opening W.I.P	-	2,68,500
Less: Closing W.I.P	2,68,500	3,76,500
Cost of goods produced	27,81,500	38,42,000
Less: Depreciation	(3,75,000)	(3,75,000)
Cash Cost of Production	24,06,500	34,67,000
Add: Opening Stock at Average Cost:	-	4,01,083
Cash Cost of Goods Available for sale	24,06,500	38,68,083
Less: Closing Stock at Avg. Cost $\left(\frac{Rs.\,24,06,500 \times 2,000}{12,000}\right)$ $\left(\frac{Rs.\,34,67,000 \times 1,000}{18,000}\right)$	4,01,083	1,92,611
Cash Cost of Goods Sold	20,05,417	36,75,472

4. Receivables (Debtors)

	Year 1 Rs	**Year 2 Rs.**
Cash Cost of Goods Sold	20,05,417	36,75,472
Add: Selling expenses – Variable (Sales unit × Rs. 8)	80,000	1,52,000
Add: Selling expenses -Fixed (25,000 units × Rs. 2)	50,000	50,000
Cash Cost of Debtors	21,35,417	38,77,472
Average Debtors	2,66,927	4,84,684

Calculation of Stock of Work – in - progress (Cash Cost Basis)

Particulars		Rs.
Raw Material (material cost × 15%)	1,80,000	2,70,000
Labour & Mfg. Expenses (Labour & mfg. expenses × 15% × 40%)	88,500	1,06,500
Total	2,68,500	3,76,500

QUESTION 8 : MTP – MAY 2020 / MTP – OCT 2023 / RTP – MAY 2019

Cost sheet of A&R Ltd. provides the following particulars:

	Amount per unit (Rs.)
Raw materials cost	200.00
Direct Labour cost	75.00
Overheads cost	150.00
Total cost	425.00
Profit	75.00
Selling Price	500.00

The Company keeps raw material in stock, on an average for four weeks; 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 is two weeks.

The Company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at Rs.2,50,000.

Required:

PREPARE a statement showing estimate of Working Capital needed to finance an activity level of 2,60,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 80% complete in all respects.

SOLUTION :

Statement showing Estimate of Working Capital Needs

	(Amount in Rs.)	(Amount in Rs.)
A. Current Assets		
(I) Inventories:		
Raw material (4 weeks) $\left[\frac{2,60,000 \text{ units x Rs. } 200}{52 \text{ weeks}} \text{ x 4 weeks}\right]$	40,00,000	
WIP Inventory (1 week) $\left[\frac{2,60,000 \text{ units x Rs. } 425}{52 \text{ weeks}} \text{ x 1 weeks}\right] \text{ x } 0.8$	17,00,000	
Finished goods inventory (2 weeks)	42,50,000	99,50,000

$\left[\frac{2,60,000 \text{ units x Rs. } 425}{52 \text{ weeks}} \text{ x 2 weeks}\right]$		
(ii) Receivables (Debtors) (4 weeks) $\left[\frac{2,60,000 \text{ units x Rs. } 425}{52 \text{ weeks}} \text{ x 2 weeks}\right] \text{ x } \frac{4}{5^{th}}$		68,00,000
(iii) Cash and bank balance		2,50,000
Total Current Assets		1,70,00,000
B. Current Liabilities		
(I) Payables (Creditors) for materials (3 weeks) $\left[\frac{2,60,000 \text{ units x Rs. } 200}{52 \text{ weeks}} \text{ x 3 weeks}\right]$		30,00,000
(ii) Outstanding wages (1 week) $\left[\frac{2,60,000 \text{ units x Rs. } 75}{52 \text{ weeks}} \text{ x 1 weeks}\right]$		3,75,000
(iii) Outstanding overheads (2 weeks) $\left[\frac{2,60,000 \text{ units x Rs. } 150}{52 \text{ weeks}} \text{ x 2 weeks}\right]$		15,00,000
Total Current Liabilities		48,75,000
Net Working Capital Needs (A 3 B)		1,21,25,000

QUESTION 9 : MTP – MAY 2022 / RTP – MAY 2018

Following information is forecasted by Gween Limited for the year ending 31st March, 2022:

	Balance as at 31st March, 2022 (Rs. in lakh)	Balance as at 31st March, 2021 (Rs. in lakh)
Raw Material	845	585
Work-in-progress	663	455
Finished goods	910	780
Receivables	1,755	1,456
Payables	923	884
Annual purchases of raw material (all credit)	5,200	
Annual cost of production	5,850	
Annual cost of goods sold	6,825	
Annual operating cost	4,225	
Annual sales (all credit)	7,605	

Considering one year as equal to 365 days, CALCULATE:

(i) Net operating cycle period.

(ii) Number of operating cycles in the year.

(iii) Amount of working capital requirement.

SOLUTION :

Working Notes:

1. Raw Material Storage Period (R)

$$= \frac{\textit{Average} \text{ stock of Raw Material}}{\textit{Annual} \text{ Consumption of Raw Material}} \times 365$$

$$= \frac{\frac{Rs.\ 585 + Rs.\ 845}{2}}{Rs.\ 4940} \times 365 = 53 \text{ days}$$

Annual Consumption of Raw Material = Opening Stock + Purchases - Closing Stock

= = Rs. 585 + Rs. 5,200 – Rs. 845 = Rs. 4,940 lakh

2. Work - in - Progress (WIP) Conversion Period (W)

$$= \frac{\textit{Average} \text{ stock of WIP}}{\textit{Annual} \text{ Cost of Production}} \times 365$$

$$= \frac{\frac{Rs.\ 455 + Rs.\ 663}{2}}{Rs.\ 5{,}850} \times 365 = 35 \text{ days}$$

3. Finished Stock Storage Period (F)

$$= \frac{\textit{Average} \text{ stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 365$$

$$= \frac{\frac{Rs.\ 780 + Rs.\ 910}{2}}{Rs.\ 6{,}825} \times 365 = 45 \text{ days}$$

4. Receivables (Debtors) Collection Period (D)

$$= \frac{\textit{Average} \text{ Receivables}}{\textit{Annual} \text{ Credit Sales}} \times 365$$

$$= \frac{\frac{Rs.\ 1{,}456 + Rs.\ 1{,}755}{2}}{Rs.\ 7{,}605} \times 365 = 77 \text{ days}$$

5. Payables (Creditors) Payment Period (C)

$$= \frac{\textit{Average} \text{ Payables for Materials}}{\textit{Annual} \text{ Credit Purchases}} \times 365$$

$$= \frac{\frac{Rs.\ 883 + Rs.\ 923}{2}}{Rs.\ 5{,}200} \times 365 = 64 \text{ days}$$

(i) Net Operating Cycle Period

= R + W + F + D – C

= 53 + 35 + 45 + 77 – 64 = 146 days

(ii) Number of Operating Cycles in the Year

$$= \frac{365}{\textit{Operating} \text{ Cycle Period}} = \frac{365}{146} = 2.5 \text{ times}$$

(iii) Amount of Working Capital Required

$$= \frac{\textit{Annual} \text{ Operating Cost}}{\textit{Number} \text{ of Operating Cycles}} = \frac{Rs.\ 4{,}225}{2.5} = \text{Rs. } 1{,}690 \text{ Lakh}$$

Note: Number of days may vary due to fraction.

QUESTION 10 : RTP – MAY 2019 / RTP – NOV 2018

A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are Rs. 2.60 crores and Rs. 2.34 crores respectively. Estimated Sales and EBIT depend on current assets investment, particularly inventories and book-debts. The Financial Controller of the company is examining the following alternative Working Capital Policies:

(Rs. In crore)

Working Capital Policy	Investment in Current Assets	Estimated Sales	EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use Rs. 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate-Average	12%	16%

You are required to CALCULATE the following:

(i) Working Capital Investment for each policy:
- (a) Net Working Capital position
- (b) Rate of Return
- (c) Current ratio

(ii) Financing for each policy:
- (a) Net Working Capital position.
- (b) Rate of Return on Shareholders9 equity.
- (c) Current ratio. (RTP May '19, Nov '18)

SOLUTION :

(i) Statement showing Working Capital Investment for each policy

(Rs. In crore)

	Working Capital Policy		
	Conservative	**Moderate**	**Aggressive**
Current Assets: (i)	4.50	3.90	2.60
Fixed Assets: (ii)	2.60	2.60	2.60
Total Assets: (iii)	7.10	6.50	5.20
Current liabilities: (iv)	2.34	2.34	2.34
Net Worth: (v) = (iii) - (iv)	4.76	4.16	2.86

Total liabilities: (iv) + (v)	7.10	6.50	5.20
Estimated Sales: (vi)	12.30	11.50	10.00
EBIT: (vii)	1.23	1.15	1.00
(a) Net working capital position: (i) - (iv)	2.16	1.56	0.26
(b) Rate of return: (vii) /(iii)	17.32%	17.69%	19.23%
(c) Current ratio: (i)/ (iv)	1.92	1.67	1.11

(ii) Statement Showing Effect of Alternative Financing Policy

(Rs. in crore)

Financing Policy	**Conservative**	**Moderate**	**Aggressive**
Current Assets (i)	3.90	3.90	3.90
Fixed Assets (ii)	2.60	2.60	2.60
Total Assets (iii)	6.50	6.50	6.50
Current Liabilities (iv)	2.34	2.34	2.34
Short term Debt (v)	0.54	1.00	1.50
Total current liabilities	2.88	3.34	3.84
(vi) = (iv) + (v)			
Long term Debt (vii)	1.12	0.66	0.16
Equity Capital (viii)	2.50	2.50	2.50
Total liabilities (ix) = (vi)+(vii)+(viii)	6.50	6.50	6.50
Forecasted Sales	11.50	11.50	11.50
EBIT (x)	1.15	1.15	1.15
Less: Interest on short-term debt	0.06 (12% of Rs. 0.54)	0.12 (12% of Rs. 1)	0.18 (12% of Rs. 1.5)
Interest on long term debt	0.18 (16% of Rs. 1.12)	0.11 (16% of Rs. 0.66)	0.03 (16% of Rs. 0.16)
Earnings before tax (EBT) (xi)	0.91	0.92	0.94
Taxes @ 35% (xii)	0.32	0.32	0.33
Earnings after tax: (xiii) = (xi) 3 (xii)	0.59	0.60	0.61
(a) Net Working Capital Position: (i) - [(iv) + (v)]	1.02	0.56	0.06
(b) Rate of return on shareholders' Equity capital : (xiii)/ (viii)	23.6%	24.0%	24.4%
(c) Current Ratio (i) / (vi)	1.35	1.17	1.02

QUESTION 11 : RTP – MAY 2020 / PYP – MAY 2018 / MTP – MAR 2018

Day Ltd., a newly formed company has applied to the Private Bank for the first Prakshal Shah | 8779794646 time for financing it's Working Capital Requirements. The following information is available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31,200 plus unit of work in progress 12,000
Raw Material Cost	Rs. 40 per unit
Direct Wages Cost	Rs. 15 per unit
Overhead	Rs. 40 per unit (inclusive of Depreciation ¹10 per unit)
Selling Price	Rs. 130 per unit
Raw Material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24,000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment) Expected Cash Balance	15 days Rs. 2,00,000

Assume that production is carried on evenly throughout the year (360 days) and wages and overheads accrue similarly. All sales are on the credit basis. You are required to CALCULATE the Net Working Capital Requirement on Cash Cost Basis.

SOLUTION :

Calculation of Net Working Capital requirement:

	Rs.	Rs.
A. Current Assets:		
Inventories:		
Stock of Raw material (Refer to Working note (iii)	1,44,000	
Stock of Work in progress (Refer to Working note (ii)	7,50,000	
Stock of Finished goods (Refer to Working note (iv)	20,40,000	
Debtors for Sales(Refer to Working note (v)	1,02,000	
Cash	2,00,000	
Gross Working Capital	32,36,000	32,36,000
B. Current Liabilities:		
Creditors for Purchases (Refer to Working note (vi)	1,56,000	
Creditors for wages (Refer to Working note (vii)	23,250	
Net Working Capital (A - B)	1,79,250	1,79,250

Working Notes:

(i) Annual cost of production

	(Rs.)
Raw material requirements {(31,200 × Rs. 40) + (12,000 x Rs. 40)}	17,28,000
wages {(31,200 ×Rs. 15) +(12,000 Prakshal Shah | 8779794646 X Rs. 15 x 0.5)}	5,58,000

Overheads (exclusive of depreciation) {(31,200 × Rs. 30) + (12,000 x Rs. 30 x 0.5)}	11,16,000
Gross Factory Cost	34,02,000
Less: Closing W.I.P [12,000 (Rs. 40 + Rs. 7.5 + Rs. 15)]	(7,50,000)
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods (Rs. 26,52,000 × 24,000/31,200)	(20,40,000)
Total Cash Cost of Sales*	6,12,000

[*Note: Alternatively, Total Cash Cost of Sales = (31,200 units 3 24,000 units) x (Rs. 40 + Rs. 15 + Rs. 30) = Rs. 6,12,000]

(ii) Work in progress stock

	(Rs.)
Raw material requirements (12,000 units × Rs. 40)	4,80,000
Direct wages (50% × 12,000 units × Rs. 15)	90,000
Overheads (50% × 12,000 units × Rs. 30)	1,80,000
	7,50,000

(iii) Raw material stock

It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year. Hence, the raw material consumption for the year (360 days) is as follows:

	(Rs.)
For Finished goods (31,200 × Rs. 40)	12,48,000
For Work in progress (12,000 × Rs. 40)	4,80,000
	17,28,000

Raw material stock = $\frac{Rs.17,28,000}{360\ days}$ x 30 days = Rs. 1,44,000

(iv) Finished goods stock:

24,000 units @ Rs. (40+15+30) per unit = Rs. 20,40,000

Debtors for sale: Rs. 6,12,000 x $\frac{60\ days}{360\ days}$ = Rs. 1,02,000

(v) Creditors for raw material Purchases [Working Note (iii)]:

Annual Material Consumed (Rs. 12,48,000 + Rs. 4,80,000) Rs. 17,28,000

Add: Closing stock of raw material [(Rs. 17,28,000 x 30 days) / 360 days] Rs. 1,44,000

Credit allowed by suppliers = $\frac{Rs.18,72,000}{360\ days}$ x 30 days = Rs. 1,56,000

(vi) Creditors for wages:

Outstanding wage payment = [(31,200 units x Rs. 15) + (12,000 units x Rs. 15 x .50)] x 15 days / 360 days

= $\frac{Rs.5,58,000}{360\ days}$ x 15 days = Rs. 23,250

QUESTION 12 : PYP – NOV 2020

PK Ltd., a manufacturing company, provides the following information:

	(Rs.)
Sales	1,08,00,000
Raw Material Consumed	27,00,000
Labour Paid	21,60,000
Manufacturing Overhead (Including Depreciation for the year Rs. 3,60,000)	32,40,000
Administrative & Selling Overhead	10,80,000

Additional Information:

(a) Receivables are allowed 3 months' credit.
(b) Raw Material Supplier extends 3 months' credit.
(c) Lag in payment of Labour is 1 month.
(d) Manufacturing Overhead are paid one month in arrears.
(e) Administrative & Selling Overhead is paid 1-month advance.
(f) Inventory holding period of Raw Material & Finished Goods are of 3 months.
(g) Work-in-Progress is Nil.
(h) PK Ltd. sells goods at Cost plus 33s%.
(i) Cash Balance Rs. 3,00,000.
(j) Safety Margin 10%.

You are required to compute the Working Capital Requirements of PK Ltd. on Cash Cost basis.

SOLUTION :

Statement showing the requirements of Working Capital (Cash Cost basis)

Particulars	**Rs.**	**Rs.**
A. Current Assets:		
Inventory:		
Stock of Raw material (Rs.27,00,000 × 3/12)	6,75,000	
Stock of Finished goods (Rs. 77,40,000 × 3/12)	19,35,000	
Receivables (Rs. 88,20,000 × 3/12)	22,05,000	
Administrative and Selling Overhead (Rs.10,80,000 × 1/12)	90,000	
Cash in Hand	3,00,000	
Gross Working Capital	52,05,000	52,05,000
B. Current Liabilities:		
Payables for Raw materials* (Rs.27,00,000 × 3/12)	6,75,000	
Outstanding Expenses:		
Wages Expenses (Rs.21,60,000 × 1/12)	1,80,000	
Manufacturing Overhead (Rs.28,80,000 × 1/12)	2,40,000	
Total Current Liabilities	10,95,000	10,95,000
Net Working Capital (A-B)		41,10,000
Add: Safety margin @ 10%		4,11,000
Total Working Capital requirements		45,21,000

Working Notes:

(A) Computation of Annual Cash Cost of Production	**(Rs.)**
Raw Material consumed	27,00,000
Wages (Labour paid)	21,60,000
Manufacturing overhead (Rs. 32,40,000 – Rs. 3,60,000)	28,80,000
Total cash cost of production	77,40,000
(B) Computation of Annual Cash Cost of Sales	**(Rs.)**
Cash cost of production as in (A) above	77,40,000
Administrative & Selling overhead	10,80,000
Total cash cost of sales	88,20,000

*Purchase of Raw material can also be calculated by adjusting Closing Stock and Opening Stock (assumed nil). In that case Purchase will be Raw material consumed +Closing Stock-Opening Stock i.e. Rs.27,00,000 + Rs. 6,75,000 - Nil = Rs.33,75,000. Accordingly, Total Working Capital requirements (Rs.43,35,375) can be calculated.

Thanks ….

CHAPTER

13

CASH BUDGET

QUESTION 1 : MTP - OCT 2019

A firm maintains a separate account for cash disbursement. Total disbursement are Rs.10,50,000 per month or Rs. 1,26,00,000 per year. Administrative and transaction cost of transferring cash to disbursement account is Rs.20 per transfer. Marketable securities yield is 8% per annum. COMPUTE the optimum cash balance according to William J. Baumol model.

SOLUTION :

The optimum cash balance C = $\sqrt{\frac{2 \times Rs.1,26,00,000 \times Rs.20}{0.08}}$ = Rs.79,372.54

QUESTION 2 : NOV 2019

Slide Ltd is preparing a cash flow forecast for the three months period from January to the end of March. The following sales volumes have been forecasted

	December	January	February	March	April
Sales (Units)	1800	1875	1950	2100	2250

Selling price per unit is Rs. 600. Sales are all on one-month credit. Production of goods for sale takes place one month before sales. Each unit produced requires two units of raw materials costing Rs. 150 per unit. No raw material inventory is held. Raw materials purchases are on one month credit. Variable overheads and wages equal to Rs. 100 per unit are incurred during production and paid in the month of production. The opening cash balance on 1st January is expected to be Rs. 35,000. A long term loan of Rs. 2,00,000 is expected to be received in the month of March. A machine costing Rs. 3,00,000 will be purchased in March.

(a) Prepare a cash budget for the months of January, February and March calculate the cash balance at the end of each month in the three months period

(b) Calculate the forecast current ratio at the end of the three months period.

SOLUTION :

Working Notes:

1. Calculation of collection from Trade Receivables :

Particulars	December	January	February	March
Sales (Units)	1,800	1,875	1,950	2,100
Sales (@Rs. 600 per unit)/ Trade Receivables (Debtors) (Rs)	10,80,000	11,25,000	11,70,000	12,60,000
Collection from Trade Receivables (Debtors) (Rs)		10,80,000	11,25,000	11,70,000

2. Calculation of Payment to Trade Payables:

Particulars	December	January	February	March
Output (Units)	1,875	1,950	2,100	2,250
Raw Material (2 Units per output) (Units)	3,750	3,900	4,200	4,500
Raw Material (@ Rs. 150 per unit) / Trade Payables (Creditors) (Rs)	5,62, 500	5,85,000	6,30,000	6,75,000
Payment to Trade Payables (Creditors) (Rs)		5,62,500	5,85,000	6,30,000

3. Calculation of Variable Overheads and Wages:

Particulars	January	February	March
Output (Units)	1,950	2,100	2,250
Payment in the same month @ Rs. 100 per unit	1,95,000	2,10,000	2,25,000

a. Preparation of Cash Budget

Particulars	January (Rs)	February (Rs)	March (Rs)
Opening Balance	35,000	3,57,500	6,87,500
Receipts:			
Collection from Trade Receivables (Debtors)	10,80,000	11,25,000	11,70,000
Receipt of Long – Term Loan			2,00,000
Total (A)	**11,15,000**	**14,82,500**	**20,57,500**
Payments:			
Trade Payables (Creditors) for Materials	5,62,500	5,85,000	6,30,000
Variable overheads and Wages	1,95,000	2,10,000	2,25,000
Purchase of Machinery			3,00,000
Total (B)	**7,57,500**	**7,95,000**	**11,55,000**
Closing Balance (A-B)	**3,57,500**	**6,87,500**	**9,02,500**

b. Calculation of Current Ratio

Particulars	March (Rs)
Output Inventory (i.e. units produced in March)	9,00,000

[(2,250 units x 2 units of raw material per unit of output x Rs. 150 per unit of raw material) + 2,250 units x Rs. 100 for variable overheads wages] Or, [6,75,000 + 2,25,000] from Working Notes 2 and	
Trade Receivables (Debtors)	12,60,000
Cash Balance	9,02,500
Current Assets	**30,62,500**
Trade payables (Creditors)	6,75,000
Current Liabilities	**6,75,000**
Current Ratio (Current Assets / Current Liabilities)	**4.537 Approx.**

QUESTION 3 : PAPER - DEC 2021

A garment trader is preparing cash forecast for first three months of calendar year 2021. His estimated sales for the forecasted periods are as below :

	January (Rs. '000)	February (Rs. '000)	March (Rs. '000)
Total Sales	**600**	**600**	**800**

(i) The trader sells directly to public against cash payments and to other entitles on credit. Credit sales are expected to be four times the value of direct sales to public. He expects 15% customers to pay in the month in which credit sales are made, 25% to pay in the next month and 58% to pay in the next to next month. The outstanding balance is expected to be written off.

(ii) Purchases of goods are made in the month prior to sales and it amounts to 90% of sales and are made on credit. Payments of these occur in the month after the purchase. No inventories of goods are held.

(iii) Cash balance as on 1st January 2021 is Rs. 50,000

(iv) Actual Sales for the last two months of calendar year 2020 are as below :

	November (Rs. '000)	December (Rs. '000)
Total Sales	**640**	**880**

You are required to prepare a monthly cash budget for the three months from January to March 2021.

SOLUTION :

(1) Calculation of cash and credit sales

(Rs. in thousands)

	Nov.	Dec.	Jan.	Feb.	Mar
Total Sales	640	880	600	600	800
Cash Sales (1/5th of total sales)	128	176	120	120	160
Credit Sales (4/5th of total sales)	512	704	480	480	640

(2) Calculation of Credit Sales Receipts

(Rs. in thousands)

	Nov.	Dec.	Jan.	Feb.	Mar
Forecast Credit sales (Working note 1)	512.00	704.00	480.00	480.00	640.00
Receipts:					
15% in the month of sales			**72.00**	**72.00**	**96.00**
25% in next month			**176.00**	**120.00**	**120.00**
58% in next to next month			**296.96**	**408.32**	**278.40**
Total			544.96	600.32	494.40

Cash Budget

(Rs. in thousands)

	Nov.	Dec.	Jan.	Feb.	Mar
Opening Balance (A)			50.00	174.96	355.28
Sales	640.00	880.00	600.00	600.00	800.00
Receipts:					
Cash Collection (Working note 1)			120.00	120.00	160.00
Credit Collections (Working note 2)			544.96	600.32	494.40
Total (B)			664.96	720.32	654.40
Purchases (90% of sales in the month prior to sales)		540	540	720	
Payments:					
Payment for purchases (next month)			**540**	**540**	**720**
Total (C)			**540**	**540**	**720**
Closing balance(D) = (A + B – C)			174.96	355.28	289.68

QUESTION 4 : PAPER - NOV 2022

K Ltd a Quarterly cash outflow of Rs. 9,00,000 arising uniformly during the Quarter. The company has an Investment portfolio of Marketable Securities. It plans to meet the demands for cash by periodically selling marketable securities. The marketable securities are generating a return of 12% p.a. Transactions cost of converting investments to cash is Rs. 60. The company uses Baumol model to find out the optimal transaction size for converting marketable securities into cash. Consider 360 days in a year.

You are required to calculate

i. Company's average cash balance
ii. Number of conversions each year and
iii. Time interval between two conversions.

SOLUTION :

Answer:

i. Computation of Average Cash balance:

Annual cash outflow (U) = 9,00,000 x 4 = Rs. 36,00,000

Fixed cost per transaction (P) = Rs. 60

Opportunity cost of one-rupee p.a. (S) = $\frac{12}{100} = 0.12$

Optimum cash balance (C) =

$$\sqrt{\frac{2UP}{S}} = \sqrt{\frac{2 \text{ x } 36,00,000 \text{ x } 60}{0.12}} = \text{Rs. } 60,000$$

∴ Average Cash balance = $\frac{(0 + 60,000)}{2} = \text{Rs. } 30,000$

(ii) Number of conversions p.a.

Annual cash outflow = Rs. 36,00,000

Optimum cash balance = Rs. 60,000

∴ No. of conversions p.a = $\frac{36,00,000}{60,000} = 60$

(iii) Time interval between two conversions

No. of days in a year = 360

No. of conversions p.a. = 60

∴ Time interval = $\frac{360}{60} = 6 \text{ days}$

QUESTION 5 : RTP - NOV 2022

A company was incorporated w.e.f. 1st April, 2021. Its authorised capital was Rs. 1,00,00,000 divided into 10 lakh equity shares of Rs. 10 each. It intends to raise capital by issuing equity shares of Rs. 50,00,000 (fully paid) on 1st April. Besides this, a loan of Rs. 6,50,000 @ 12% per annum will be obtained from a financial institution on 1st April and further borrowings will be made at same rate of interest on the first day of the month in which borrowing is required. All borrowings will be repaid along with interest on the expiry of one year.

The company will make payment for the following assets in April.

Particulars	**(Rs.)**
Plant and Machinery	10,00,000
Land and Building	20,00,000
Furniture	5,00,000
Motor Vehicles	5,00,000
Stock of Raw Materials	5,00,000

The following further details are available:

(1) Projected Sales (April-September):

	(Rs.)
April	15,00,000
May	17,50,000
June	17,50,000
July	20,00,000
August	20,00,000
September	22,50,000

(2) Gross profit margin will be 25% on sales.
(3) The company will make credit sales only and these will be collected in the second month following sales.
(4) Creditors will be paid in the first month following credit purchases. There will be credit purchases only.
(5) The company will keep minimum stock of raw materials of Rs. 5,00,000.
(6) Depreciation will be charged @ 10% per annum on cost on all fixed assets.
(7) Payment of miscellaneous expenses of Rs. 50,000 will be made in April.
(8) Wages and salaries will be Rs. 1,00,000 each month and will be paid on the first day of the next month.
(9) Administrative expenses of Rs.50,000 per month will be paid in the month of their incurrence.
(10) No minimum cash balance is required.

You are required to PREPARE the monthly cash budget (April-September), the projected Income Statement for the 6 months period and the projected Balance Sheet as on 30th September, 2021.

SOLUTION :

	Apr.	May	June	July	Aug.	Sept.
Opening cash	-	10,50,000	-	1,37,500	5,25,000	7,25,000
balance						
A. Cash inflows						
Equity shares	50,00,000	-	-	-	-	-
Loans (Refer to working note 1)	6,50,000	1,25,000	-	-	-	-
Receipt from debtors	-	-	15,00,000	17,50,000	17,50,000	20,00,000
Total (A)	56,50,000	11,75,000	15,00,000	18,87,500	22,75,000	27,25,000
B. Cash Outflows						
Plant and Machinery	10,00,000	-	-	-	-	-
Land and Building	20,00,000	-	-	-	-	-
Furniture	5,00,000	-	-	-	-	-
Motor Vehicles	5,00,000	-	-	-	-	-
Stock of raw materials	5,00,000	-	-	-	-	-
(Minimum stock)						
Miscellaneous expenses	50,000	-	-	-	-	-
Payment to creditors for credit purchases (Refer to working note 2)	-	10,25,000	12,12,500	12,12,500	14,00,000	14,00,000
Wages and salaries	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Admn. expenses	50,000	50,000	50,000	50,000	50,000	50,000
Total :(B)	46,00,000	11,75,000	13,62,500	13,62,500	15,50,000	15,50,000
Closing balance (A)-(B)	10,50,000	-	1,37,500	5,25,000	7,25,000	11,75,000

Budgeted Income Statement for six-month period ending 30th September

Particulars	Rs.	Particulars	Rs.
To Purchases	83,37,500	By Sales	1,12,50,000
To Wages and Salaries	6,00,000	By Closing stock	5,00,000

To Gross profit c/d	28,12,500		
	1,17,50,000		1,17,50,000
To Admn. expenses	3,00,000	By Gross profit b/d	28,12,500
To Depreciation	2,00,000		
(10% on Rs. 40 lakhs for six months)			
To Accrued interest on loan (Refer to working note 3)	45,250		
To Miscellaneous expenses	50,000		
To Net profit c/d	22,17,250		
	28,12,500		28,12,500

Projected Balance Sheet as on 30th September 2021

Liabilities		**Amount (Rs.)**	**Assets**			**Amount (Rs.)**
Share Capital:			Fixed Assets:			
Authorized capital			Land and Building	20,00,000		
Less: Depreciationrised capital 10,00,000 equity shares of Rs. 10 each		1,00,00,000	Less : Depreciation	1,00,000	19,00,000	
Issued, subscribed and paid-up capital 5,00,000 equity shares of Rs. 10 each		50,000	Plant and Machinery	10,00,000		
Reserve and Surplus:			Less: Depreciation	50,000	9,50,000	
Profit and Loss		22,17,250	Furniture	5,00,000		
Long-term loans		7,75,000	Less: Depreciation	25,000	4,75,000	
Current liabilities and provisions:			Motor Vehicles	5,00,000		
Sundry creditors	15,87,500		Less: Depreciation	25,000	4,75,000	38,00,000
Accrued interest	45,250		Current Assets:			
Outstanding expenses	1,00,000	17,32,750	Stock		5,00,000	
			Sundry debtors		42,50,000	
			Cash		11,75,000	59,25,000
		97,75,000				**97,75,000**

Working Notes:

Subsequent Borrowings Needed

	April	**May**	**June**	**July**	**August**	**September**
Cash Inflow						
Equity shares	50,00,000					
Loans	6,50,000					
Receipt from debtors	-	-	15,00,000	17,50,000	17,50,000	20,00,000
Total (A)	56,50,000	-	15,00,000	17,50,000	17,50,000	20,00,000
Cash Outflow						

Purchase of fixed assets	40,00,000					
Stock	5,00,000					
Miscellaneous expenses	50,000					
Payment to creditors	-	10,25,000	12,12,500	12,12,500	14,00,000	14,00,000
Wages and salaries	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Administrative expenses	50,000	50,000	50,000	50,000	50,000	50,000

(1) There is shortage of cash in May of Rs. 1,25,000 which will be met by borrowings in May.

(2) Payment to Creditors

Purchases = Cost of goods sold - Wages and salaries

Purchases for April = (75% of 15,00,000) - Rs. 1,00,000 = Rs. 10,25,000

(Note: Since gross margin is 25% of sales, cost of manufacture i.e. materials plus wages and salaries should be 75% of sales)

Hence, Purchases = Cost of manufacture minus wages and salaries of Rs. 1,00,000)

The creditors are paid in the first month following purchases.

Therefore, payment in May is Rs. 10,25,000

The same procedure will be followed for other months.

April	(75% of 15,00,000)	– Rs. 1,00,000	= Rs. 10,25,000
May	(75% of 17,50,000)	– Rs. 1,00,000	= Rs. 12,12,500
June	(75% of 17,50,000)	– Rs. 1,00,000	= Rs. 12,12,500
July	(75% of 20,00,000)	– Rs. 1,00,000	= Rs. 14,00,000
August	(75% of 20,00,000)	– Rs. 1,00,000	= Rs. 14,00,000
September	(75% of 22,50,000)	– Rs. 1,00,000	= Rs. 15,87,500
Minimum Stock			Rs. 5,00,000
Total Purchases			Rs. 83,37,500

(3) Accrued Interest on Loan

12% interest on Rs.6,50,000 for 6 months	39,000
Add: 12% interest on Rs.1,25,000 for 5 months	6,250
	45,250

QUESTION 6 : MTP - MAR 2023

You are given the following information:

(i) Estimated monthly Sales are as follows:

	Rs.		Rs.
January	5,50,000	June	4,40,000
February	6,60,000	July	5,50,000
March	7,70,000	August	4,40,000
April	4,40,000	September	3,30,000
May	3,30,000	October	5,50,000

(ii) Wages and Salaries are estimated to be payable as follows:

	Rs.		Rs.
April	49,500	July	55,000
May	44,000	August	49,500
June	55,000	September	49,500

(iii) Of the sales, 75% is on credit and 25% for cash. 60% of the credit sales are collected within one month and the balance in two months. There are no bad debt losses.

(iv) Purchases amount to 75% of sales and are made and paid for in the month preceding the sales.

(v) The firm has taken a loan of Rs.6,00,000. Interest @ 12% p.a. has to be paid quarterly in January, April and so on.

(vi) The firm is to make payment of tax of Rs.26,000 in July 2023.

(vii) The firm had a cash balance of Rs.35,000 on 1St April 2023 which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

Required:

PREPARE monthly cash budgets for six months beginning from April, 2023 on the basis of the above information.

SOLUTION :

Computation 3 Collections from Customers

Particulars	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Total Sales	6,60,000	7,70,000	4,40,000	3,30,000	4,40,000	5,50,000	4,40,000	3,30,000
Credit Sales (75% of total Sales)	4,95,000	5,77,500	3,30,000	2,47,500	3,30,000	4,12,500	3,30,000	2,47,500
Collection (within one month)		2,97,000	3,46,500	1,98,000	1,48,500	1,98,000	2,47,500	1,98,000
Collection (within two months)			1,98,000	2,31,000	1,32,000	99,000	1,32,000	1,65,000
Total Collections			5,44,500	4,29,000	2,80,500	2,97,000	3,79,500	3,63,000

Monthly Cash Budget for Six Months: April to September 2023

Particulars	Apr.	May	June	July	Aug.	Sept.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Receipts:						
Opening Balance	35,000	35,000	35,000	35,000	35,000	35,000
Cash Sales	1,10,000	82,500	1,10,000	1,37,500	1,10,000	82,500
Collections from Debtors	5,44,500	4,29,000	2,80,500	2,97,000	3,79,500	3,63,000
Total Receipts (A)	6,89,500	5,46,500	4,25,500	4,69,500	5,24,500	4,80,500
Payments:						

Purchases	2,47,500	3,30,000	4,12,500	3,30,000	2,47,500	4,12,500
Wages and Salaries	49,500	44,000	55,000	55,000	49,500	49,500
Interest on Loan	18,000	-----	-----	18,000	-----	-----
Tax Payment	-----	-----	-----	26,000	-----	-----
Total Payment (B)	3,15,000	3,74,000	4,67,500	4,29,000	2,97,000	4,62,000
Minimum Cash Balance	35,000	35,000	35,000	35,000	35,000	35,000
Total Cash Required (C)	3,50,000	4,09,000	5,02,500	4,64,000	3,32,000	4,97,000
Surplus/ (Deficit) (A)-(C)	3,39,500	1,37,500	-77,000	5,500	1,92,500	-16,500
Investment/Financing:						
Total effect of (Invest)/ Financing (D)	-3,39,500	-1,37,500	77,000	-5,500	-1,92,500	16,500
Closing Cash Balance (A) + (D) - (B)	35,000	35,000	35,000	35,000	35,000	35,000

Thanks ….

CHAPTER

12

MANAGEMENT OF INVENTORIES

QUESTION 1 : PYP - MAR 2022

A company requires 36,000 units of a product per year at cost of Rs. 100 per unit. Ordering cost per order is Rs. 250 and the carrying cost is 4.5% per year of the inventory cost. Normal lead time is 25 days and safety stock is NIL.

Assume 360 working days in a year.

i. Calculate the Recorder Inventory Level.

ii. Calculate the Economic Order Quantity (EOQ).

iii. If the supplier offers 1% quantity discount for purchase in lots of 90,000 units or more, should the company accept the proposal?

SOLUTION :

Annual Consumption = 36,000 (A)

Ordering Cost = Rs. 250 per order (O)

Carrying Cost $= \frac{4.5}{100} \times 100$

= Rs. 4.5 (C)

Lead Time = 25 days

(i) Reorder Level = Lead Time × Daily Consumption

$= 25 \times \frac{36,000}{360}$

= 2,500 units

Economic Order Quantity (EOQ) $= \sqrt{\frac{2AO}{C}}$

$= \sqrt{\frac{2 \times 36,000 \times 250}{4.5}}$

= 2,000 Units

(ii) Evaluation of Profitability of Quantity Discount Offer:

(a) When EOQ is ordered

		Rs.
Purchase Cost	(36,000 units x Rs. 100)	36,00,000
Ordering Cost	[(36,000 units/2,000 units) x Rs. 250]	4,500
Carrying Cost	(2,000 units x ½ x Rs. 4.5)	4,500
Total Cost		**36,09,000**

(b) When Quantity Discount is accepted

		Rs.
Purchase Cost	(36,000 units x Rs. 99*)	35,64,000
Ordering Cost	[(36,000 units/9,000 units) x Rs. 250]	1,000
Carrying Cost	(9,000 units x ½ x Rs. 99 x 4.5%)	20,048
Total Cost		**35,85,048**

*Unit Cost = Rs.100
Less : Quantity Discount @ 1% = Rs. 1
Purchase Cost = Rs. 99

Advise – The total cost of inventory is lower if Quantity Discount is accepted. Hence, the company is advised to accept the proposal.

Thanks ….

CHAPTER

13

MANAGEMENT OF RECEIVABLES

QUESTION 1 : NOV 2018

MN Ltd has a current turnover of Rs 30,00,000 p.a. Cost of Sales is 80% of turnover and bad debts are 2% of turnover. Cost of sales includes 70% variable cost and 30% of Fixed cost, while company's required rate of return is 15%. MN Ltd currently allows 15 days credit to its customer, but it is considering increase this 45 days credit in order to increase turnover. It has been estimated that this change in policy will increase the turnover by 20%, while bad debts will increase by 1%. It is not expected that the policy change will result in an increase fixed cost and creditors and stock will be unchanged.

Should MN Ltd. introduce the proposed policy? Assume 360 days a year.

SOLUTION :

Statement Showing Evaluation of Credit Policies

	Particulars	**Present Policy**	**Proposed Policy**
A	Expected Contribution		
	(a) Credit Sales	30,00,000	36,00,000
	(b) Less: Variable Cost	16,80,000	20,16,000
	(c) Contribution	13,20,000	15,84,000
	(d) Less: Bad Debts	60,000	1,08,000
	(e) Contribution after Bad debt [(c)-(d)]	12,60,000	14,76,000
B	Opportunity Cost of investment in Receivables	15,000	54,000
C	Net Benefits [A-B]	12,45,000	14,22,000
D	Increase in Benefit		1,77,000

Recommendation: Proposed Policy i.e credit from 15 days to 45 days should be implemented by NM Ltd since the net benefit under this policy are higher than those under present policy

Working Note:

(1)

	Present Policy	**Propose Policy**

	(Rs.)	(Rs.)
Sales	30,00,000	36,00,000
Cost of Sales (80% of sales)	24,00,000	28,80,000
Variable cost (70% of cost of sales)	16,80,000	20,16,000

2. Opportunity Costs of Average Investments

$$= \text{Variable Cost} \times \frac{\text{Collection period}}{360} \times \text{Rate of Return}$$

Present Policy $= \text{Rs. } 24,00,000 \times \frac{45}{360} \times 15\% = \text{Rs.}54,000$

Proposed Policy $= \text{Rs. } 28,80,000 \times \frac{15}{360} \times 15\% = \text{Rs.}18,000$

QUESTION 2 : JULY 2021

Current annual sale of SKD Ltd is Rs. 360 Lakhs. Its directors are of the option that company's current expenditure on receivables management is too high and with a view to reduce the expenditure they are considering following two new alternate credit policies:

	Policy X	Policy Y
Average collection period	1.5 Months	1 month
% of default	2%	1%
Annual collection expenditure	Rs. 12 Lakh	Rs. 20 Lakh

Selling price per unit of product is Rs. 150. Total cost per unit is Rs. 120. Current credit terms are 2 months and percentage of default is 3%. Current annual collection expenditure is Rs. 8 lakh. Required rate of return on investment of SKD Ltd is 20%. Determine which credit policy SKD Ltd. should follow.

SOLUTION :

Statement showing the Evaluation of Credit policies (Total Approach)

	Particulars	Present Policy (2 months) Rs. In Lakhs	Proposed Policy X (1.5 months) Rs. In Lakhs	Proposed Policy Y (1 month) Rs. In Lakhs
A.	**Expected Profit :**			
	(a) Credit Sales *	360	360	360
	(b) Total Cost other than Bad Debts and collection expenditure (360/150 x 120)	288	288	288
	(c) Bad Debts	10.8 (360 x 0.03)	7.2 (360 x 0.02)	3.6 (360 x 0.01)
	(d) Collection expenditure	8	12	20
	(e) Expected Profit [(a) – (b) – (c) – (d)]	53.2	52.8	48.4
B.	**Opportunity Cost of Investments in Receivables (Working Note)**	9.6	7.2	4.8
C.	**Net Benefits (A – B)**	43.6	45.6	43.6

Recommendation: The Proposed Policy X should be followed since the net benefits under this policy are higher as compared to other policies

*** Note :** It is assumed that all sales are on credit.

Working Note:

Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost x $\frac{Collection\,period}{12}$ x $\frac{Rate\ of\ Return}{100}$

Present Policy = Rs. 288 Lakhs x $\frac{2}{12}$ x $\frac{20}{100}$ = Rs. 9.6 Lakhs

Policy X = Rs. 288 Lakhs x $\frac{1.5}{12}$ x $\frac{20}{100}$ = Rs. 7.2 Lakhs

Policy Y = Rs. 288 Lakhs x $\frac{1}{12}$ x $\frac{20}{100}$ = Rs. 4.8 Lakhs

QUESTION 3 : DEC 2021

A factoring firm has offered a company to buy its accounts receivables.

The relevant information is given below.

(i) The current average collection period for the company's debt is 80 days and ½ % of debtors default. The factor has agreed to pay over money due, to the company after 60 days and it will suffer all the losses of bad debts also.

(ii) Factor will charge commission @ 2%

(iii) The company spends Rs. 1,00,000 p.a. on administration of debtor. These are avoidable cost.

(iv) Annual credit sales are Rs. 90 lakhs. Total variable costs is 80% of sales. The company's cost of borrowing is 15% per annum.

Assume 365 days in a year.

Should the company enter into agreement with factoring firm?

SOLUTION :

(a)

	Particulars	Rs.
A.	**Annual Savings (Benefit) on taking Factoring Service**	
	Cost of credit administration saved	1,00,000
	Bad debts avoided (Rs. 90 lakh x ½%)	45,000
	Interest saved due to reduction in average collection period [Rs. 90 lakh x 0.80 × 0.15 × (80 days – 60 days)/365 days]	**59,178**
	Total	**2,04,178**
B.	**Annual Cost of Factoring to the Firm:**	
	Factoring Commission [Rs. 90 lakh × 2%]	1,80,000
	Total	**1,80,000**
C.	**Net Annual Benefit of Factoring to the Firm (A – B)**	**24,178**

Advice: Since savings to the firm exceeds the cost to the firm on account of factoring, therefore, the company should enter into agreement with the factoring firm

QUESTION 4 : MAY 2023

A company has current sale of Rs. 12 Lakhs per year. The profit-volume ratio is 20% and post tax cost of investment is receivables is 15%. The current credit terms are 1/10, net 50 days and average collection period is 40 days. 50% of customers in terms of sales revenue are availing cash discount and bad debt is 2% of sales.

In order to increase sales, the company want to liberalize its existing credit terms to 2/10, net 35 days. Due to which, expected sales will increase to Rs. 15 lakhs. Percentage of default in sales will remain same. Average collection period will decrease by 10 days. 80% of customers in terms of sales revenue are expected to avail cash discount under this proposed policy.

Tax rate is 30%.

ADVISE, should the company change its credit terms. (Assume 360 days in a year)

SOLUTION :

Advice

(i) Calculation of Cash Discount

Cash Discount = Total credit sales × % of customers who take up discount × Rate

$$Present\ Policy = \frac{12,00,000 \times 50 \times 0.01}{100} \text{ Rs. } 6,000$$

Proposed Policy = 15,00,000 × 0.80 × 0.02 = Rs. 24,000

(ii) Opportunity Cost of Investment in Receivables

Present Policy: Opportunity Cost = Total Cost × $\frac{Collection\ period}{360} \times \frac{Rate\ \text{of Return}}{100}$

= 9,60,000 x $\frac{40}{360} \times \frac{15}{100}$ = Rs. 16,000

Proposed Policy Total Cost × $\frac{Collection\ period}{360} \times \frac{Rate\ \text{of Return}}{100}$

= 12,00,000 x $\frac{30}{360} \times \frac{15}{100}$ = Rs. 15,000

Statement showing Evaluation of Credit Policies

Particulars	Present Policy	Proposed Policy
Credit Sales	12,00,000	15,00,000
Variable Cost @ 80%* of sales	9,60,000	12,00,000
Bad Debts @ 2%	24,000	30,000
Cash Discount	6,000	24,000
Profit before tax	**2,10,000**	**2,46,000**
Tax @ 30%	63,000	73,800
Profit after Tax	**1,47,000**	**1,72,200**
Opportunity Cost of Investment in Receivables	16,000	15,000
Net Profit	**1,31,000**	**1,57,200**

*Only relevant or variable costs are considered for calculating the opportunity costs on the funds blocked in receivables. Since 20% is profit-volume ratio, hence the relevant costs are taken to be 80% of the respective sales.

Advise: Proposed policy should be adopted since the net benefit is increased by (Rs. 1,57,200 – Rs. 1,31,000) = Rs. 26,200.

QUESTION 5 : PYP - MAY 2023

A company is presently having credit sales of Rs. 12 lakh. The existing credit terms are 1/10, net 45 days and average collection period is 30 days. The current bad debts loss is 1.5%. In order to accelerate the collection process further as also to increase sales, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by 1/3 of existing sales, bad debts increase to 2% of sales and average collection period to decline to 20 days. The contribution to sales ratio of the company is 22% and opportunity cost of investment in receivables is 15 percent (pre-tax). 50 per cent and 80 percent of customers in terms of sales revenue are expected to avail cash discount under existing and liberalization scheme respectively. The tax rate is 30%. ADVISE, should the company change its credit terms? (Assume 360 days in a year).

SOLUTION :

Working Notes:

(i) Calculation of Cash Discount

Cash Discount = Total credit sales × % of customers who take up discount × Rate

Present Policy = $\frac{12,00,000 \text{ x } 50 \text{ x } 0.1}{100}$ = Rs. 6,000

Proposed Policy = 16,00,000 × 0.80 × 0.02 = Rs. 25,600

(ii) Opportunity Cost of Investment in Receivables

Present Policy = 9,36,000 × (30/360) × (70% of 15)/100 = 78,000 ×10.5/100 = Rs. 8,190

Proposed Policy = 12,48,000 × (20/360) V10.50/100 = Rs. 7,280

Statement showing Evaluation of Credit Policies

Particulars	Present Policy	Proposed Policy
Credit Sales	12,00,000	16,00,000
Variable Cost @ 78%* of sales	9,36,000	12,48,000
Bad Debts @ 1.5% and 2%	18,000	32,000
Cash Discount	6,000	25,600
Profit before tax	2,40,000	2,94,400
Tax @ 30%	72,000	88,320
Profit after Tax	1,68,000	2,06,080
Opportunity Cost Receivables of Investment in	8,190	7,280
Net Profit	1,59,810	1,98,800

*Only relevant or variable costs are considered for calculating the opportunity costs on the funds blocked in receivables. Since 22% is contribution, hence the relevant costs are taken to be 78% of the respective sales.
Advise: Proposed policy should be adopted since the net benefit is increased by (Rs. 1,98,800 - 1,59,810) Rs. 38,990.

QUESTION 6 : MTP - OCT 2019 / MTP – OCT 2020 / MTP OCT - 2022

RST Limited is considering relaxing its present credit policy and is in the process of evaluating two proposed polices. Currently, the firm has annual credit sales of Rs 225 lakhs and accounts receivable turnover ratio of 5 times a year. The current level of loss due to bad debts is Rs.7,50,000. The firm is required to give a return of 20% on the investment in new accounts receivables. The company9s variable costs are 60% of the selling price. Given the following information, DETERMINE which is a better option? Amount in lakhs)

	Present Policy	Policy Option I	Policy Option II
Annual credit sales (Rs)	225	275	350
Accounts receivable turnover ratio	5	4	3
Bad debt losses (Rs)	7.5	22.5	47.5

SOLUTION :

Statement showing Evaluation of Credit Policies (Amount in lakhs)

	Particulars	Present Policy (Rs.)	Proposed Policy I (Rs.)	Proposed Policy II (Rs.)
A	Expected Profit :			
	(a) Credit Sales	225.00	275.00	350.00
	(b) Total Cost other than Bad Debts:			
	Variable Costs	135.00	165.00	210.00
	(c) Bad Debts	7.50	22.50	47.50
	(d) Expected Profit [(a)-(b)-(c)]	82.50	87.50	92.50
B	Opportunity Cost of Investment in Receivables*	5.40	8.25	14.00
	Net Benefits [A-B]	77.10	79.25	78.50

Recommendation: The Proposed Policy I should be adopted since the net benefits under this policy is higher than those under other policies.

Working Note:

*Calculation of Opportunity Cost of Average Investments

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection Period}}{12} \times \frac{\textit{Rate of Return}}{100}$$

Present Policy = Rs.135 lakhs × 2.4/12 × 20% = Rs. 5.40 lakhs
Proposed Policy I = Rs. 165 lakhs × 3/12 × 20% = Rs. 8.25 lakhs
Proposed Policy II = Rs. 210 lakhs × 4/12 × 20% = Rs. 14.00 lakhs

QUESTION 7 : MTP - MAY 2019

A bank is analyzing the receivables of J Ltd. in order to identify acceptable collateral for a short-term loan. The company's credit policy is 2/10 net 30. The bank lends 80 percent on accounts where customers are not currently overdue and where the average payment period does not exceed 10 days past the net period. A schedule of J Ltd.9s receivables has been prepared. ANALYSE, how much will the bank lend on pledge of receivables, if the bank uses a 10 per cent allowance for cash discount and returns?

Account	Amount Rs.	Days Outstanding in days	Average Payment Period historically
74	25,000	15	20
91	9,000	45	60
107	11,500	22	24
108	2,300	9	10
114	18,000	50	45
116	29,000	16	10
123	14,000	27	48
	1,08,800		

SOLUTION :

Analysis of the receivables of J Ltd. by the bank in order to identify acceptable collateral for a short- term loan:

(i) The J Ltd.9s credit policy is 2/10 net 30. The bank lends 80 per cent on accounts where customers are not currently overdue and where the average payment period does not exceed 10 days past the net period i.e. thirty days. From the schedule of receivables of J Ltd. Account No. 91 and Account No. 114 are currently overdue and for Account No. 123 the average payment period exceeds 40 days. Hence Account Nos. 91, 114 and 123 are eliminated. Therefore, the selected Accounts Are Account Nos. 74, 107, 108 and 116.

(ii) Statement showing the calculation of the amount which the bank will lend on a pledge of receivables if the bank uses a 10 per cent allowances for cash discount and returns

Account No.	Amount (Rs.)	per cent of amount (Rs.)	80% of amount (Rs.)
	(a)	(b) = 90% of (a)	(c) = 80% of (b)
74	25,000	22,500	18,000
107	11,500	10,350	8280
108	2,300	2,070	1,656
116	29,000	26,100	20,880
Total loan amount			**48,816**

QUESTION 8 : MTP - SEPT 2022

GT Ltd. is taking into account the revision of its credit policy with a view to increasing its sales and profit. Currently, all its sales are on one month credit. Other information is as follows:

Contribution 2/5th of Sales Revenue

Additional funds raising cost 20% per annum

The marketing manager of the company has given the following options along with estimates for considerations:

Particulars	Current Position	Option I	Option II	Option III
Sales Revenue (Rs.)	40,00,000	42,00,000	44,00,000	50,00,000
Credit period (in months)	1	$1\frac{1}{2}$	2	3
Bad debts (% of sales)	2	$2\frac{1}{2}$	3	5
Cost of Credit administration (Rs.)	24,000	26,000	30,000	60,000

You are required to ADVISE the company for the best option.

SOLUTION :

Statement Showing Evaluation of Credit Policies

(Rs. in lakhs)

Particulars	Current position (1 month)	Option I (1.5 months)	Option II (2 months)	Option III (3 months)
Sales Revenue	40,00,000	42,00,000	44,00,000	50,00,000
Contribution @ 40%	16,00,000	16,80,000	17,60,000	20,00,000
Increase in contribution over current level (A)	-	80,000	1,60,000	4,00,000
Debtors = (Average Collection period x Credit Sale 12	$\frac{1 \times 40,00,000}{12}$ = 3,33,333.33	$\frac{1.5 \times 42,00,000}{12}$ = 5,25,000	$\frac{2 \times 44,00,000}{12}$ = 7,33,333.33	$\frac{3 \times 50,00,000}{12}$ = 12,50,000
Increase in debtors over current level	2	1,91,666.67	4,00,000.00	9,16,666.67
Cost of funds for additional amount of debtors @ 20% (B)	-	38,333.33	80,000.00	1,83,333.33
Credit administrative cost	24,000	26,000	30,000	60,000
Increase in credit administration cost over present level (C)		2,000	6,000	36,000
Bad debts	80,000	1,05,000	1,32,000	2,50,000
Increase in bad debts over current levels (D)	-	25,000	52,000	1,70,000
Net gain/loss A 3 (B + C + D)	-	14,666.67	22,000.00	10,666.67

Advise: It is suggested that the company GT Ltd. should implement Option II with a net gain of Rs. 22,000 which has a credit period of 2 months.

QUESTION 9 : RTP - MAY 2023

River limited currently uses the credit terms of 1.5/15 net 45 days and average collection period was 30 days. The company presently having sales of Rs. 50,00,000 and 30% customers availing the discount. The chances of default are currently 5%. Variable cost constitutes 65% and total cost constitute 85% of sales. The company is planning liberalization of credit terms to 2/20 net 50 days. It is expected that sales are likely to increase by Rs. 5,00,000, the default chances are 10% and average collection period will decline to 25 days. There won't be any change in the fixed cost and 50% customers are expected to avail the discount. Tax rate is 35%.

EVALUATE this policy in comparison with the current policy and recommend whether the new policy should be implemented. Assume cost of capital to be 10% (post tax) and 360 days in a year.

SOLUTION :

Evaluation of Credit Policies

	Particulars	1.5/15 net 45	2/20 net 50
A	Sales	Rs. 50,00,000	Rs. 55,00,000
B	Variable Cost (65%)	Rs. 32,50,000	Rs. 35,75,000
B	Fixed Cost (20% in 1st Case)	Rs. 10,00,000	Rs. 10,00,000
D	Bad Debts (5% and 10%)	Rs. 2,50,000	Rs. 5,50,000
E	Discounts		
	(Rs. 5000000x30%x1.5%)	Rs. 22,500	-
	(Rs. 5500000x50%x2%)	-	Rs. 55,000
F	PBT (A-B-C-D-E)	Rs. 4,77,500	Rs. 3,20,000
G	Tax @ 35%	Rs. 1,67,125	Rs. 1,12,000
H	PAT	Rs. 3,10,375	Rs. 2,08,000
I	Opportunity Cost		
	(Rs. 3250000 + Rs. 1000000) x 30/360x10%	Rs. 35,417	-
	(Rs. 3575000 + Rs. 1000000) x 25/360 x 10%	-	Rs. 31,771
J	Net Benefit	Rs. 2,74,958	Rs. 1,76,229

The new policy leads to lower net benefit for the company. Hence it should not be implemented.

QUESTION 10 : RTP - NOV 2023 / RTP – NOV 2019

A regular customer of your company has approached to you for extension of credit facility for purchasing of goods. On analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges:

Pattern of Payment Schedule	
At the end of 30 days	20% of the bill
At the end of 60 days	30% of the bill
At the end of 90 days	30% of the bill
At the end of 100 days	18% of the bill
Non-recovery	2% of the bill

The customer wants to enter into a firm commitment for purchase of goods of Rs. 40 lakhs in 2022, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is Rs. 400 on which a profit of Rs. 20 per unit is expected to be made. It is anticipated that taking up of this contract would mean an extra recurring expenditure of Rs. 20,000 per annum. If the opportunity cost is 18% per annum, would you as the finance manager of the company RECOMMEND the grant of credit to the customer? Assume 1 year = 360 days.

SOLUTION :

Statement showing the Evaluation of credit Policies

Particulars	Proposed Policy Rs.
A. Expected Profit:	
(a) Credit Sales	40,00,000
(b) Total Cost	
(i) Variable Costs (Rs. 380 x 10000 units)	38,00,000
(ii) Recurring Costs	20,000
	38,20,000
(c) Bad Debts	80,000
(d) Expected Profit [(a) 3 (b) 3 (c)]	1,00,000
B. Opportunity Cost of Investments in Receivables	1,31,790
C. Net Benefits (A - B)	(31,790)

Recommendation: The Proposed Policy should not be adopted since the net benefits under this policy are negative.

Working Note: Calculation of Opportunity Cost of Average Investments

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\textit{Collection}\ \text{period}}{360} \times \frac{\textit{Rate}\ \text{of Return}}{100}$$

Particulars	20%	30%	30%	18%	Total
A. Total Cost	7,64,000	11,46,000	11,46,000	6,87,600	37,43,600
B. Collection period	30/360	60/360	90/360	100/360	
C. Required Rate of Return	18%	18%	18%	18%	
D. Opportunity Cost (A × B × C)	11,460	34,380	51,570	34,380	1,31,790

QUESTION 11 : PAPER – MAY 2024

Following is the sales information in respect of Bright ltd. :

Annual Sales (90% on credit)	Rs.7,50,00,000
Credit period	45 days
Average Collection period	70 days
Bade debts	0..75%
Credit administration cost (out of which 2/5th is avoidable)	Rs.18,60,000

A factor firm has offered to manage the company's debtors on a non-recourse basis at a service charge of 2%. Factor agrees to grant advance against debtors at an interest rate of 14% after withholding 20% as reserve. Payment period guaranteed by factor is 45 days. The cost of capital of the company is 12.5%. One time redundancy payment of Rs.50,000 is required to be made to factor.

Calculate the effective cost of factoring to the company.

(Assume 360 days in a year)

Thanks ….

CHAPTER

14 MANAGEMENT OF PAYABLES

QUESTION 1 : RTP - MAR 2018

A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase. However, A Ltd. has a choice of paying Rs.98.50 per Rs.100 it owes to X Ltd. on or before 10th day of purchase.

Required:

EXAMINE whether A Ltd. should accept the offer of discount assuming average billing of A Ltd. with X Ltd. is Rs.10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

SOLUTION :

Annual Benefit of accepting the Discount

$$\frac{Rs.1.5}{Rs.100 - Rs.1.50} \times \frac{365\ days}{40 - 10\ days} = 18.53\%$$

Annual Cost = Opportunity Cost of foregoing interest on investment = 15%

If average invoice amount is Rs.10,00,000

	If discount is	
	Accepted (Rs.)	**Not Accepted (Rs.)**
Payment to Supplier (Rs.)	9,85,000	10,00,000
Return on investment of ¹9,85,000 for 30 days {Rs.9,85,000 × (30/365) × 15%}		(12,144)
	9,85,000	9,87,856

Thus, from above table it can be seen that it is cheaper to accept the discount.

Thanks ....

CHAPTER

15

FINANCING OF WORKING CAPITAL

QUESTION 1 : RTP - NOV 2021 / MTP – APR 2023

Sundaram limited a plastic manufacturing company had invested enormous amount of money in a new expansion project. Due to such a great amount of capital investment, Company needs an additional Rs.2,00,00,000 in working capital immediately. The CFO has determined the following three feasible sources of working capital funds:

Bank Loan: The company's bank will lend Rs.2,30,00,000 at 12% per annum. However, the bank will require 15% of the loan granted to be kept in a current account as the minimum average balance which otherwise would have been just Rs. 50,000.

Trade Credit: A major supplier with 2/20 net 80 credit terms has approached for supply of raw material worth Rs.1,90,00,000 p.m.

Factoring: factoring firm will buy the companies receivables of Rs. 2,50,00,000 per month, which have a collection period of 60 days. factor will advance up to 75% of the face value of the receivables at 14 percent per annum. Factor Commission will amount to 2% on all receivables purchased. Factoring will save credit department expense and bad debts of Rs. 1,75,000 p.m. and Rs. 2,25,000 p.m.

Based on annual percentage cost, ADVISE which alternative should the company select. Assume 360 days a year.

SOLUTION :

(i) **Bank Loan:** As the minimum average balance more than Rs. 50,000 need not be kept if loan is not undertaken, the incremental money made available by bank through bank loan is Rs. 2,30,00,000- (15% x Rs. 2,30,00,000-Rs. 50,000) = Rs. 1,96,00,000. Real annual cost of bank loan = (Rs. 2.3 crores x 12%) / Rs. 1.96 crores = 14.08%.

(ii) **Trade Credit**: The real annual cost of trade credit will be 2/98 x 360/60 x 100 = 12.24%.

(iii) **Factoring:**

Commission charges per year = 2% x 2.5 crores x 12 = Rs. 60,00,000 Savings per year = (1,75,000+2,25,000) x 12 = Rs. 48,00,000

Net Factoring cost per year = Rs. 60,00,000 3 Rs. 48,00,000 = Rs.12,00,000 Annual cost of borrowing Rs. 2.5 crores x 75% i.e. Rs. 1,87,50,000 will be

$$\frac{1,87,50,000 \times 14\% + Rs.12,00,000}{1,87,50,000} = 20.4\%$$

Conclusion : The company should select trade credit as a preferred mode of financing the working capital requirement as it results in lowest cost on an annual basis.

QUESTION 2 : RTP - MAY 2023

Kalyan limited has provided you the following information for the year 2021-22:

By working at 60% of its capacity the company was able to generate sales of Rs. 72,00,000. Direct labour cost per unit amounted to Rs. 20 per unit. Direct material cost per unit was 40% of the selling price per unit. Selling price was 3 times the direct labour cost per unit. Profit margin was 25% on the total cost.

For the year 2022-23, the company makes the following estimates:

Production and sales will increase to 90% of its capacity. Raw material per unit price will remain unchanged. Direct expense per unit will increase by 50%. Direct labour per unit will increase by 10%. Despite the fluctuations in the cost structure, the company wants to maintain the same profit margin on sales. Raw materials will be in stock for one month whereas finished goods will remain in stock for two months. Production cycle is for 2 months. Credit period allowed by suppliers is 2 months. Sales are made to three zones :

Zone	Percentage of sale	Mode of Credit
A	50%	Credit period of 2 months
B	30%	Credit period of 3 months
C	20%	Cash Sales

There are no cash purchases and cash balance will be Rs. 1,11,000

The company plans to apply for a working capital financing from bank for the year 2022 - 23. ESTIMATE Net Working Capital of the Company receivables to be taken on sales and also COMPUTE the maximum permissible bank finance for the company using 3 criteria of Tandon Committee Norms. (Assume stock of finished goods to be a core current asset)

SOLUTION :

Cost Structure

		2021-22			2022-23	
Particulars	**Calculations**	**P.U.**	**Amount (p.u. x units)**	**Calculations**	**P.U.**	**Amount (p.u. x units)**
Direct Material	40% of SP	Rs.24	Rs.28,80,000	Same as PY	Rs.24	Rs.43,20,000
Direct labour	Given	Rs.20	Rs.24,00,000	20*1.1	Rs.22	Rs.39,60,000
Direct Expenses	bal. fig.	Rs.4	Rs.4,80,000	4*1.5	Rs.6	Rs.10,80,000
Total Cost	SP - Profit	Rs.48	Rs.57,60,000		Rs.52	Rs.93,60,000
Profit	(SP/125 x 25)	Rs.12	Rs.14,40,000	52*25%	Rs.13	Rs.23,40,000
Sales	3 x Direct Labour p.u.	Rs.60	Rs.72,00,000		Rs.65	Rs.1,17,00,000

*units=		Rs.72,00,000 / Rs.60 = 1,20,000		1,20,000/60 x 90 = 1,80,000

Operating Cycle

Raw material holding period	1 month
Finished Goods holding period	2 months
WIP conversion period	2 months
Creditor Payment Period	2 months
Receivables Collection Period	2/3 months

Estimation of Working Capital

Particulars	**Calculation**	**Amount**
Current Assets		
Stock of Raw Material	43,20,000 x 1/12	Rs.3,60,000
Stock of WIP		
RM cost	Rs.43,20,000	
Labour cost	Rs.19,80,000	
Direct Exp cost	Rs.5,40,000	
Total WIP Cost	Rs.68,40,000	
Stock of WIP	68,40,000 x 2/12	Rs.11,40,000
Stock of Finished Goods	93,60,000 x 2/12	Rs.15,60,000
Receivables (on sales)		
A	1,17,00,000 x 50% x 2/12	Rs.9,75,000
B	1,17,00,000 x 30% x 3/12	Rs.8,77,500
C	NIL	-
Cash Balance	Given	Rs.1,11,000
Total Current Assets		Rs. 50,23,500
Current Liabilities		
Payables	*Rs.44,40,000 x 2/12	Rs.7,40,000
Net Working Capital		Rs. 42,83,500

Opening RM stock = 28,80,000 x 1/12= Rs.2,40,000

* RM purchased = RM consumed – Opening Stock + Closing Stock

= Rs.43,20,000 – Rs.2,40,000 + Rs.3,60,000

= Rs.44,40,000

Computation of Maximum Permissible Bank Finance

Method	Formula	Calculation	Rs.
I	75% x (Current Assets – Current Liabilities)	75% x (Rs.50,23,500 – Rs.7,40,000)	Rs.32,12,625
II	75% x Current Assets – Current Liabilities	75% x Rs.50,23,500 – Rs.7,40,000	Rs.30,27,625
III	75% x (Current Assets- Core CA) – Current	75% x (Rs.50,23,500 – Rs.15,60,000) – Rs.7,40,000	Rs.18,57,625

Thanks ….

OTHER COURSES

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- Basic of Accounting
- CA Inter - Advanced Accounting
- CA Inter - Financial Management
- CA Inter - Strategic Management
- CA Final - Advanced Financial Management
- CA Final - Financial Reporting

KANDIVALI

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