

CA INTER



NEW SYLLABUS

FINANCIAL MANAGEMENT

(COMPILER VER 3.0)



PYP



RTP



MTP

COVERED



CHAPTERWISE QUESTIONS



EXAM ORIENTED
QUESTIONS



PYP | RTP | MTP
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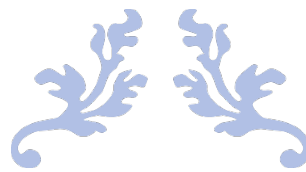


CHAPTERWISE
ARRANGEMENT



SMART PREP.
BETTER SCORES.

PROF.
RAHUL MALKAN



***CA-INTERMEDIATE
FINANCIAL
MANAGEMENT
COMPILER – 3.0***



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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 Modern World?

SOLUTION :

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

being a strategic business partner of the chief executive officer, or CEO. Some of the role of a CFO in today's 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 shareholder's 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 manager's 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 shareholders. 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 firm's profit.
- (ii) The maximization of firm's 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 firm's 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 shareholder's 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 firm's 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 firm's 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 Manager's 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 company's 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 shareholders' 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 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 shareholders' 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 shareholders' 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, $Wealth = Present\ Value\ of\ benefits - Present\ Value\ of\ Costs$. 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 shareholders 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 market 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 today's 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.

QUESTION 15 : PAPER – JAN 2025

Discuss the objectives and advantages of wealth maximization goal of Financial Management.

SOLUTION :

Objective of Wealth Maximisation:

Highest market value of shares.

Advantages of Wealth Maximisation:

- (i) Emphasizes the long term gains
- (ii) Recognises risk or uncertainty
- (iii) Recognises the timing of returns
- (iv) Considers shareholders' return.

QUESTION 16 : RTP – SEPT 2026

PQR Ltd. expanded its business by purchasing new machinery and increasing production. However, due to poor financial planning, the company is facing cash shortages, rising expenses, and difficulty managing its working capital. The management is now focusing on better budgeting, cost control, and cash flow management. In the light of the above case, explain the importance of financial management and how it helps a business achieve growth, profitability, and financial stability.

SOLUTION :

Importance of Financial Management cannot be over-emphasized. It is, indeed, the key to successful business operations. Without proper administration of finance, no business enterprise can reach at its full potentials for growth and success. Money is to an enterprise, what oil is to an engine.

Financial Management is all about planning investment, funding the investment, monitoring expenses against budget and managing gains from the investments. Financial management means management of all matters related to an organization's finances.

The best way to demonstrate the importance of good financial management is to describe some of the tasks that it involves:-

- (a) **Taking care** not to over-invest in fixed assets
- (b) **Balancing** cash-outflow with cash-inflows

- (c) **Ensuring** that there is a sufficient level of short-term working capital
- (d) **Setting** sales revenue targets that will deliver growth
- (e) **Increasing** gross profit by setting the correct pricing for products or services
- (f) **Controlling** the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and
- (g) **Tax planning** that will minimize the taxes a business has to pay.

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 increase a company's liquidity, they are also considered to be an important source 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 years 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 seller's 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 contract 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 company's 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 promoter's 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. IDBI's VCF provides funding equal to 80-87.50% 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 policy, will fix credit limits for individual exporters and the Corporation's 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 company's 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 shareholders' 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 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 maximising the shareholders' 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 shareholders' 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.

QUESTION 37 : PAPER – SEPT 2024

Discuss any 2 advantages and 2 disadvantages of raising finance by issue of debentures.

SOLUTION :**Advantages of raising finance by issue of debentures are:**

- (i) The cost of debentures is much lower than the cost of preference or equity capital as the interest is tax-deductible. Also, investors consider debenture investment safer than equity or preferred investment and, hence, may require a lower return on debenture investment.
- (ii) Debenture financing does not result in dilution of control.
- (iii) In a period of rising prices, debenture issue is advantageous. The fixed monetary outgo decreases in real terms as the price level increases. In other words, the company has to pay a fixed rate of interest.

Disadvantages of debenture financing are:

- (i) Debenture interest and the repayment of its principal amount is an obligatory payment.
- (ii) The protective covenants associated with a debenture issue may be restrictive.
- (iii) Debenture financing enhances the financial risk associated with the firm because of the reasons given in point (i).
- (i) Since debentures need to be paid at the time of maturity, a large amount of cash outflow is needed at that time.

QUESTION 38 : RTP – MAY 2025

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. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for commercial application of indigenous technology.
- (iv) **Participating debenture:** Such security carries charges in three phases — 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 39 : PAPER – MAY 2025

What are key features of bridge financing?

SOLUTION :

Key features of Bridge Financing

- (i) 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.
- (ii) The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions.
- (iii) Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes.
- (iv) Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

QUESTION 40 : PAPER – SEPT 2025

Explain in brief the following types of bonds:

- (i) Callable Bonds
- (ii) Puttable Bonds
- (iii) Masala Bonds
- (iv) Drop Lock 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.
- (iii) **Masala Bonds:** Masala (means spice) bond is an Indian name used for Rupee denominated bond that Indian corporate borrowers can sell to investors in overseas markets.
- (iv) **Drop Lock Bond:** It is a Floating Rate Note with a normal floating rate. The floating rate bond would be automatically converted into fixed rate bond if interest rate falls below a predetermined level. The new fixed rate stays till the drop lock bond reaches its maturity.

QUESTION 41 : RTP – JAN 2026

What do you understand by Spontaneous Sources of finance and explain its sources of finance?

SOLUTION :

Spontaneous sources of finance are those which naturally arise in the course of business operations. Trade credit, credit from employees, credit from suppliers of services, etc. are some of the examples which may be quoted in this respect.

Spontaneous Sources of Finance

- (i) **Trade Credit:** Trade credit is a spontaneous source of finance which is normally extended to the purchaser organization by the sellers or services providers. It contributes to about one-third of the total short-term requirements.
- (ii) **Bills Payable:** In the case of “Bills Payable” the purchaser will have to give a written promise to pay the amount of the bill/invoice either on demand or at a fixed future date to the seller or the bearer of the note.
- (iii) **Accrued Expenses:** The accrued expenses refer to the services availed by the firm, but the payment for which has yet to be made. It is a built in and an automatic source of finance as most of the services like wages, salaries, taxes, duties etc., are paid at the end of the period.

QUESTION 42 : PAPER – JAN 2026

Discuss briefly the key features of seed capital assistance as a source of finance.

SOLUTION :

Seed Capital Assistance: The Seed Capital Assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits but lack adequate financial resources. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme.

The Seed Capital Assistance is interest free but carries a service charge of one per cent per annum for the first five years and at increasing rate thereafter. However, IDBI will have the option to

charge interest at such rate as may be determined by IDBI on the loan if the financial position and profitability of the company so permits during the currency of the loan. The repayment schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium up-to five years.

QUESTION 43 : RTP – MAY 2026

DISCUSS the features of international funding and angel financing in the context of corporate financing.

SOLUTION :

International Funding: With liberalization and globalization a business enterprise has options to raise capital from International markets also. Foreign Direct Investment (FDI) and Foreign Institutional Investors (FII) are two major routes for raising funds from foreign sources besides ADR's (American depository receipts) and GDR's (Global depository receipts). Obviously, the mechanism of procurement of funds has to be modified in the light of the requirements of foreign investors.

Angel Financing: Angel Financing is a form of an equity-financing where an angel investor is a wealthy individual who provides capital for start-up or expansion, in exchange for an ownership/equity in the company. Typically, angels, as they are known as, will invest around 25 to 60 per cent to help a company get started. This source of finance sometimes is the last option for startups which doesn't qualify for bank funding and are too small for venture capital financing.

QUESTION 44 : PAPER – MAY 2026

An Indian exporter has shipped goods to a foreign buyer, but the export proceeds are yet to be realised. He approaches the bank for immediate finance assistance.

- (i) Identify the type of finance involved.
- (ii) Explain any three forms of such type of finance.

SOLUTION :

Post-shipment Finance is the type of finance involved:

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 usance 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 shipments (comprehensive risks) policy covering both political and commercial risks. The Corporation, on acceptance of the policy, will fix credit limits for individual exporters and the Corporation's 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, usance, 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 45 : RTP – SEPT 2026

Global Infra Ltd., an Indian infrastructure company, plans to raise funds from international markets for its expansion project. The Finance Director is evaluating various foreign bond options. Explain various foreign bonds for Global Infra Ltd. and their key features.

SOLUTION :

Foreign Bonds

Sl. No.	Name of Bond	Salient Features
1	Foreign Currency Convertible Bond (FCCB)	• This bond comes at a very low rate of interest. • The advantage to the issuer is that the issuer can get foreign currency at a very low cost. • The risk is that in case the bond has to be redeemed on the date of maturity, the issuer has to make the payment and at that time the issuer may not have the money.
2	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.
3	Convertible Floating Rate Notes (FRN)	• A convertible FRN is issued by giving its holder an option to convert it into a longer term debt security with a specified coupon • It protects an investor against falling interest rate • The long- term debt security can be sold in the market and the investor can earn profit • Capital gain is not applicable to FRN
4	Drop Lock Bond	• It is a Floating Rate Note with a normal floating rate • The floating rate bond would be automatically converted into fixed rate bond if interest rate falls below a predetermined level • The new fixed rate stays till the drop lock bond reaches its maturity

		• The difference between the convertible floating rate note and drop lock bond is that the former is a long option structure and the later one is a short option structure
5	Variable Rate Demand Obligations	• A normal floating rate note with a nominal maturity • The holder of the floating rate note can sell the obligation back to the trustee at par plus accrued interest • It gives the investor an option to exit, so it is more liquid than the normal FRN
6	Yield Curve Note (YCN)	• It is a structured debt security • Yield increases when prevailing interest rate declines • Yield decreases when prevailing interest rate increases • This is used to hedge the interest rate • This works like inverse floater
7	Euro Bond	• Euro bonds are issued or traded in a country using a currency other than the one in which the bond is denominated. This means that the bond uses a certain currency, but operates outside the jurisdiction of the Central Bank that issues that currency. • Eurobonds are issued by multinational corporations, for example, a British company may issue a Eurobond in Germany, denominating it in U.S. dollars. • It is important to note that the term has nothing to do with the euro, and the prefix "euro" is used more generally to refer to deposit outside the jurisdiction of the domestic central bank

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		Fixed Asset	
Current Liabilities		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 - (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 31 st 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

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

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

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

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

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

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

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

Cost of Goods Sold (COGS):

$$\begin{aligned} \text{Cost of Goods Sold} &= \text{Sales} - \text{Gross Profit} \\ &= \text{Rs.2,00,00,000} - 20\% \text{ of Rs.2,00,00,000} \\ &= \text{Rs.1,60,00,000} \end{aligned}$$

$$\begin{aligned} \text{Net Profit} &= 10\% \text{ of Sales} = 10\% \text{ of Rs.2,00,00,000} \\ &= \text{Rs.20,00,000} \end{aligned}$$

Inventory:

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

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

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

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

Receivables:

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

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

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

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

Cash:

$$\begin{aligned} \text{Cash}^* &= \text{Current Assets}^* - \text{Inventory} - \text{Receivables} \\ \text{Cash} &= \text{Rs.1,00,00,000} - \text{Rs.40,00,000} - \text{Rs.50,00,000} \\ &= \text{Rs.10,00,000} \end{aligned}$$

(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 Shareholders' funds + Debenture + Preference shares

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

= Rs.26,00,000

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

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

$$\text{Return on capital employed [ROCE - (Post-tax)]} = \frac{\text{Profit After tax}}{\text{Capital Employed}} \times 100$$

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

- iii. **Calculation of Earnings per share**

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

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

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

- iv. **Calculation of PE ratio**

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

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

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 charges (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

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

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

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

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

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

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		Fixed Assets	
Reserves and Surplus		Current Assets	
15% Debentures		Stock	
Payables		Receivables	
Bank Term Loan		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.

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

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

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

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

(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

$\therefore$ Current Assets = 2.5 x Current Liabilities = 2.5 x 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	<u>1,50,000</u>
Total Liabilities	28,50,000
Less: Current Assets	<u>10,00,000</u>
Fixed Assets	18,50,000

(v) Calculation of Composition of Current Assets

Inventory Turnover = 12

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

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

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

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	20,00,000	Fixed Assets	
Reserves and Surplus		Inventories	
Long term Debts		Accounts Receivable	
Accounts Payable		Cash	
Total		Total	

SOLUTION :

- (1) Total liability = Total Assets =
50,00,000 Debt to Total Asset Ratio
= 0.40
$$\frac{\text{Debt}}{\text{Total Assets}} = 0.40$$

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

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

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

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 = $100/80 \times 64,00,000 = 80,00,000$

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

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

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

Closing inventory = 9,77,778

(7) Accounts Receivable period = 36 days

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

$$\begin{aligned} \text{Accounts Receivable} &= 36/360 \times \text{credit sales} \\ &= 36 / 360 \times 80,00,000 \text{ (assumed all sales are on credit)} \\ \text{Accounts Receivable} &= \text{Rs. } 8,00,000 \end{aligned}$$

(8) Quick Ratio = 0.9

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

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

$$\text{Cash} + 8,00,000 = \text{Rs. } 9,90,000$$

$$\text{Cash} = \text{Rs. } 1,90,000$$

(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:

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

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

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

$$\text{Reserve \& Surplus} = 5,00,000 + 0.5 \text{ Reserve \& Surplus}$$

$$0.5 \text{ Reserve \& Surplus} = 5,00,000$$

$$\text{Reserve \& Surplus} = 10,00,000$$

$$\text{Shareholders' funds} = 10,00,000 + 10,00,000$$

$$\text{Shareholders' funds} = \text{Rs. } 20,00,000$$

(ii) Calculation of Value of Stock:

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

$$\text{Sales} = 1.5 \times 20,00,000$$

$$\text{Sales} = 30,00,000$$

$$\text{Gross Profit} = 30,00,000 \times 20\% = 6,00,000$$

$$\text{Cost of Goods Sold} = 30,00,000 - 6,00,000$$

$$= \text{Rs. } 24,00,000$$

$$\text{Stock velocity} = 2 \text{ months}$$

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

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

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

Average stock = Rs. 4,00,000

(iii) Calculation of Debtors:

Debtors Turnover Ratio = 6

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

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

Average Debtors = Rs. 5,00,000

(iv) Calculation of Current Liabilities:

Net Working Capital Turnover ratio = 2.5

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

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

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

Current Ratio = 2.5

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

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:

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

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

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

$$\begin{aligned} \text{Cost of Goods Sold} &= \text{Sales} - \text{Gross Profit} \\ &= \text{Rs. } 16,00,000 - \text{Rs. } 4,00,000 = \text{Rs. } 12,00,000 \end{aligned}$$

- (ii) Determination of Sundry Debtors:

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

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

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

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

$$\begin{aligned} \text{Or, Sundry Debtors} + \text{Bills receivable} &= \text{Rs. } 4,00,000 \\ \text{Sundry Debtors} &= \text{Rs. } 4,00,000 - \text{Rs. } 25,000 = \text{Rs. } 3,75,000 \end{aligned}$$

- (iii) Determination of Sundry Creditors:

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

$$\text{So, Creditors' turnover ratio} = \frac{12 \text{ months}}{2 \text{ months}} = 6$$

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

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

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 - Rs. 10,000 = Rs. 1,91,667

(iv) Closing Stock

Stock Turnover Ratio

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

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

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

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

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

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

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

Workings:

*Calculation of Credit purchases:

Cost of goods sold = Opening stock + Purchases - 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**

$$\text{Debt} = (10,00,000 \times 50\%) = \text{Rs. } 5,00,000$$

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

$$\text{Direct cost} = 50,000 \times 10 = \text{Rs. } 5,00,000$$

$$\text{Sales} = 5,00,000 \times 150\% = \text{Rs. } 7,50,000$$

	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
INTERMEDIATE EXAMINATION: NOVEMBER 2022	
∴ EBT	= 1,00,000
Less: Tax @ 30%	= 30,000
∴ PAT	= 70,000
Net profit margin	= $\left(\frac{70,000}{7,50,000} \right) \times 100 = 9.33\%$

(ii) Net Operating Profit margin

$$\begin{aligned} \text{Net operating profit margin} &= \left(\frac{\text{EBIT}}{\text{Sales}} \right) \times 100 \\ &= \left(\frac{1,50,000}{7,50,000} \right) \times 100 = 20\% \end{aligned}$$

(iii) Return on Assets

$$\begin{aligned} \text{Return on Assets} &= \left[\left(\frac{\text{PAT} + \text{Interest}}{\text{Total Assets}} \right) \right] \times 100 \\ &= \left[\left(\frac{1,20,000}{10,00,000} \right) \right] \times 100 = 12\% \end{aligned}$$

OR

$$\begin{aligned} \text{Return on Assets} &= \frac{\text{EBIT}}{\text{Assets}} \times 100 \\ &= \left(\frac{1,50,000}{10,00,000} \right) \times 100 = 15\% \end{aligned}$$

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

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

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		By Sales	
To Direct Wages			
To Works overhead			
To Gross Profit			
To Selling and Distribution Expenses		By Gross Profit	
To Net Profit			

Balance sheet as on 31st March

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

		Cash	
Total		Total	

SOLUTION :**a) Working Notes:**

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

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

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

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

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)

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

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

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

vi. Calculation of Current Liabilities

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

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

vii. Calculation of Receivables

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

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

$\rightarrow \text{Receivables} = \text{Rs. } 12,82,191.78 \text{ or Rs. } 12,82,192$

viii. Calculation of Long term Loan

$\frac{\text{Long term Loan}}{\text{Current Liabilities}} = \frac{2}{1} = \frac{\text{Long term Loan}}{11,00,000} \times \frac{2}{1} \rightarrow \text{Long Term}$

$\text{loan} = \text{Rs. } 22,00,000$

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
Cash balance	1,88,508

x. Calculation of Net worth

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

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

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

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

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)	46,41,000		
(Balancing figure)			
To Gross Profit c/d	11,70,000		
	<u>78,00,000</u>		<u>78,00,000</u>
To Selling and Distribution Expenses	5,46,000	By Gross Profit b/d	11,70,000
(Balancing figure)			
To Net Profit (8% of Sales)	6,24,000		
	<u>11,70,000</u>		<u>11,70,000</u>

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

- Net profit margin
- Net operating profit margin
- Return on assets
- Return on owner's equity

SOLUTION :**(i) Computation of Net Profit Margin**

$$\text{Debt} = (10,00,000 \times 50\%) = \text{Rs. } 5,00,000$$

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

$$\text{Direct cost} = 50,000 \times 10 = \text{Rs. } 5,00,000$$

$$\text{Sales} = 5,00,000 \times 150\% = \text{Rs. } 7,50,000$$

	Rs.	
Gross profit = 7,50,000 – 5,00,000	= 2,50,000	
Less: Operating expenses	<u>= 1,00,000</u>	
∴ EBIT	= 1,50,000	
Less: Interest	<u>= 50,000</u>	
∴ EBT	= 1,00,000	
Less : Tax @ 30%	<u>= 30,000</u>	
∴ PAT	<u>= 70,000</u>	
Net profit margin	$= \left(\frac{70,000}{7,50,000} \right) \times 100 = 9.33\%$	

(ii) Net Operating Profit margin

$$\begin{aligned} \text{Net operating profit margin} &= \left(\frac{EBIT}{Sales} \right) \times 100 \\ &= \left(\frac{1,50,000}{7,50,000} \right) \times 100 = 20\% \end{aligned}$$

(iii) Return on Assets

$$\begin{aligned} \text{Return on Assets} &= \left[\left(\frac{PAT + \text{Interest}}{\text{Total Assets}} \right) \right] \times 100 \\ &= \left[\left(\frac{1,20,000}{10,00,000} \right) \right] \times 100 = 12\% \end{aligned}$$

Return on Assets

OR

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

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

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 in 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
- $$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 4$$
- $$\therefore \frac{\text{Current Assets}}{3,10,000} = 4$$
- $$\therefore \text{Current Assets} = \text{Rs. } 12,40,000$$
- (ii) Acid Test Ratio = 2.5
- $$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} = 2.5$$
- $$\therefore \frac{12,40,000 - \text{Inventory}}{3,10,000} = 2.5$$
- $$\therefore 12,40,000 - \text{Inventory} = \text{Rs. } 7,75,000$$
- $$\text{Inventory} = \text{Rs. } 4,65,000$$
- (iii) Inventory Turnover Ratio (on Sales) = 6
- $$\frac{\text{Sales}}{\text{Inventory}} = 6$$
- $$\frac{\text{Sales}}{4,65,000} = 6$$
- $$\therefore \text{Sales} = \text{Rs. } 27,90,000$$
- (iv) Debtors Collection Period = 70 days
- $$\therefore (\text{Debtors} / \text{sales}) \times 360 = 70$$
- $$\therefore (\text{Debtors} / 27,90,000) \times 360 = 70$$
- $$\text{Debtors} = \text{Rs. } 5,42,500$$
- (v) Total Assets Turnover Ratio (on Sales) = 0.96
- $$\therefore \frac{\text{Sales}}{\text{Total Assets}} = 0.96$$
- $$\therefore \frac{27,90,000}{\text{Total Assets}} = 0.96$$
- $$\text{Total Assets} = \text{Rs. } 29,06,250$$
- (vi) Fixed Assets (FA) = Total Assets – Current Assets
- $$= 29,06,250 - 12,40,000$$
- $$\text{Fixed Assets} = \text{Rs. } 16,66,250$$

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

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

$$\therefore \text{Cash} = \text{Rs. } 1,33,000$$

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

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

$$(ix) \text{ Equity Dividend Coverage Ratio} = 1.6$$

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

$$\therefore DPS = \text{Rs. } 2.1875$$

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

$$\therefore \text{Number of Equity Shares} = 80,000$$

$$\therefore \text{Equity Share Capital} = 80,000 \times 10 = \text{Rs. } 8,00,000$$

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

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

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

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

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

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

$$\text{Average Receivables} = \text{Rs. 2,62,500}$$

$$\text{Closing Receivables} = \text{Rs. 2,62,500}$$

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

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

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

$$\text{Or Average Stock} = \text{Rs. } 2,10,000$$

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

$$\text{Opening Stock} + \text{Closing Stock} = \text{Rs. } 4,20,000 \dots\dots\dots (1)$$

$$\text{Also, Closing Stock} - \text{Opening Stock} = \text{Rs. } 40,000 \dots\dots\dots (2)$$

$$\text{Solving (1) and (2), we get closing stock} = \text{Rs. } 2,30,000$$

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

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

$$\text{Or Rs. } 1,20,000 + 2 \text{ Payables} = \text{Rs. } 4,92,500 + \text{Cash}$$

$$\text{Or } 2 \text{ Payables} - \text{Cash} = \text{Rs. } 3,72,500$$

$$\text{Or Cash} = 2 \text{ Payables} - \text{Rs. } 3,72,500 \dots\dots\dots (3)$$

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

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

$$\text{Or Rs. } 1,80,000 + 3 \text{ Payables} = \text{Rs. } 5,25,000 + 2 \text{ Cash}$$

$$\text{Or } 3 \text{ Payables} - 2 \text{ Cash} = \text{Rs. } 3,45,000 \dots\dots\dots (4)$$

Substitute (3) in (4)

$$\text{Or } 3 \text{ Payables} - 2(2 \text{ Payables} - \text{Rs. } 3,72,500) = \text{Rs. } 3,45,000$$

$$\text{Or } 3 \text{ Payables} - 4 \text{ Payables} + \text{Rs. } 7,45,000 = \text{Rs. } 3,45,000$$

$$(\text{Payables}) = \text{Rs. } 3,45,000 - \text{Rs. } 7,45,000$$

$$\text{Payables} = \text{Rs. } 4,00,000$$

$$\text{So, Cash} = 2 \times \text{Rs. } 4,00,000 - \text{Rs. } 3,72,500$$

$$\text{Cash} = \text{Rs. } 4,27,500$$

$$(v) \quad \text{Long term Debt} = 45\% \text{ of Net Worth}$$

$$\text{Or Rs. } 6,75,000 = 45\% \text{ of Net Worth}$$

$$\text{Net Worth} = \text{Rs. } 15,00,000$$

$$(vi) \quad \text{Equity Share Capital (ESC)} + \text{Reserves} = \text{Rs. } 15,00,000$$

$$\text{Or ESC} + 0.2\text{ESC} = \text{Rs. } 15,00,000$$

$$\text{Or } 1.2 \text{ ESC} = \text{Rs. } 15,00,000$$

$$\text{Equity Share Capital (ESC)} = \text{Rs. } 12,50,000$$

$$(vii) \quad \text{Reserves} = 0.2 \times \text{Rs. } 12,50,000$$

$$\text{Reserves} = \text{Rs. } 2,50,000$$

$$(viii) \quad \text{Total of Liabilities} = \text{Total of Assets}$$

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. 17,15,000 × 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,

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

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

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

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

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

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

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 :

$$\begin{aligned}
 \text{Gross Profit} &= \text{Rs. } 1,20,000 \\
 \text{Gross Profit Margin} &= 40\% \\
 \therefore \text{Sales} &= \frac{\text{Gross Profit}}{\text{Gross Profit Margin}} = \text{Rs. } 1,20,000 / 0.40 = \text{Rs. } 3,00,000 \\
 \text{Net profit (PBT)} &= 3,00,000 \times 10\% = \text{Rs. } 30,000 \\
 \text{PBIT/PBT} &= 2 \\
 \text{PBIT} &= 2 \times 30,000 \\
 \text{PBIT} &= 60,000 \\
 \text{Interest} &= 60,000 - 30,000 = \text{Rs. } 30,000 \\
 \text{Credit Sales to Total Sales} &= 80\% \\
 \therefore \text{Credit Sales} &= \text{Rs. } 3,00,000 \times 0.80 = \text{Rs. } 2,40,000 \\
 \text{Total Assets Turnover} &= 0.4 \text{ times} \\
 \therefore \text{Total Assets} &= \frac{\text{Sales}}{\text{Total Assets Turnover}} \\
 &= \frac{\text{Rs. } 3,00,000}{0.4} = \text{Rs. } 7,50,000 \\
 \text{Inventory turnover} &= 5 \text{ times} \\
 \text{Inventory} &= \frac{\text{Sales}}{\text{Inventory turnover}} = \frac{3,00,000}{5} \\
 \text{Average Collection Period} &= 30 \text{ days} \\
 \therefore \text{Debtors turnover} &= \frac{\text{Credit Sales}}{\text{Debtors turnover}} = \frac{\text{Rs. } 2,40,000}{12} = \text{Rs. } 20,000 \\
 \text{Current ratio} &= 2 \\
 2 &= \frac{\text{Debtors} + \text{Inventory} + \text{Cash (Current Assets)}}{\text{Creditors (Current Liabilities)}} \\
 2 \text{ Creditors} &= (\text{Rs. } 20,000 + \text{Rs. } 60,000 + \text{Cash}) \\
 2 \text{ Creditors} &= \text{Rs. } 80,000 + \text{Cash} \text{ ----- (i)} \\
 \text{Long-term Debt to Equity} &= 40\% \\
 \text{Shareholders' Funds (Equity)} &= \text{Rs. } 5,00,000 \\
 \therefore \text{Long-term Debt} &= \text{Rs. } 5,00,000 \times 40\% = \text{Rs. } 2,00,000 \\
 \text{Creditors} &= \text{Total Assets} - (\text{Shareholder's fund} + \text{Long term debt}) \\
 &= \text{Rs. } 7,50,000 - (5,00,000 + 2,00,000) = \text{Rs. } 50,000 \\
 \therefore \text{Cash} &= (\text{Rs. } 50,000 \times 2) - \text{Rs. } 80,000 = \text{Rs. } 20,000 \text{ [From equation (i)]}
 \end{aligned}$$

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
	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 $= \frac{\text{EBIT}}{\text{Interest}} = \frac{27,22,500}{5,62,500} = 4.84 \text{ times}$
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

$$\text{i.e. } \frac{\text{Debt}}{\text{Equity}} = \frac{1.5}{1} \quad \text{ie } \frac{45,00,000}{\text{Equity}} = \frac{1.5}{1}$$

$$\text{So, Equity} = 30,00,000$$

2) Return on Shareholder Fund = 54%

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

$$\text{So, PAT} = 30,00,000 \times 54\% = 16,20,000$$

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%

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

$$\text{therefore Operating Cost} = 1,81,50,000 - 27,22,500 = 1,54,27,500$$

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

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

$$\text{\& Cost of Goods Sold} = 1,15,70,625$$

6) Current Ratio = 1 : 8 : 1

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

7) Assets = Liabilities

$$\text{FA} + \text{CA} = \text{Equity} + \text{Debt} + \text{CL}$$

$$39,00,000 + 1.8\text{CL} = 30,00,000 + 45,00,000 + \text{CL}$$

$$\text{i.e. } 0.8 \text{ CL} = 36,00,000$$

$$\text{therefore CL} = 45,00,000$$

$$\text{i.e. CA} = 45,00,000 \times 1.8 = 81,00,000$$

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:

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

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

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

$$\begin{aligned} \text{Cost of Goods Sold} &= \text{Sales} - \text{Gross Profit} \\ &= \text{Rs. } 16,00,000 - \text{Rs. } 4,00,000 = \text{Rs. } 12,00,000 \end{aligned}$$

(ii) Determination of Sundry Debtors:

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

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

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

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

$$\begin{aligned} \text{Or, Sundry Debtors} + \text{Bills receivable} &= \text{Rs. } 4,00,000 \\ \text{Sundry Debtors} &= \text{Rs. } 4,00,000 - \text{Rs. } 25,000 = \text{Rs. } 3,75,000 \end{aligned}$$

(iii) Determination of Sundry Creditors:

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

$$\text{So, Creditors' turnover ratio} = \frac{12 \text{ months}}{2 \text{ months}} = 6$$

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

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

$$\begin{aligned} \text{So, Sundry Creditors} + \text{Bills Payable} &= \text{Rs. } 2,01,667 \\ \text{Or, Sundry Creditors} + \text{Rs. } 10,000 &= \text{Rs. } 2,01,667 \end{aligned}$$

$$\text{Or, Sundry Creditors} = \text{Rs. } 2,01,667 - \text{Rs. } 10,000 = \text{Rs. } 1,91,667$$

(iv) Closing Stock

Stock Turnover Ratio

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

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

$$\begin{aligned} \text{Now Average Stock} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\ &= \frac{\text{Opening Stock} + \text{Rs. 10,000}}{2} = \text{Rs. 8,00,000} \end{aligned}$$

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

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

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

Workings:

*Calculation of Credit purchases:

Cost of goods sold = Opening stock + Purchases - 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 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 = $\frac{CPGS}{Average\ Inventory}$

= 6 = $\frac{Rs. 4,50,00,000}{Average\ Inventory}$

Average inventory = Rs.75,00,000

Computation of Purchases

Purchases = COGS + (Closing Stock - Opening Stock)

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

Purchases = Rs.4,66,00,000

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

Computation of Average Debtors

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

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 = $\frac{Rs. 6,00,00,000}{125} \times 100$

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

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

Debtors Turnover Ratio =

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

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

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

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

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

Average Creditors = Rs.42,00,000

(iii) Computation of Average Payment Period

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

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

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

Alternatively

Average Payment Period = 365/Creditors Turnover Ratio

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

(iv) Computation of Average Collection Period

Average Collection Period =

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

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

Alternatively

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

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

(v) Computation of Current Assets

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

2.4 Current Liabilities = Current Assets

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

Further, Working capital = Current Assets - Current liabilities

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

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

$$\text{CA} = \text{Rs.96,00,000}$$

(vi) Computation of Current Liabilities

Current liabilities

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

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 :

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

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

SOLUTION :

QUESTION 23 : RTP – SEPT 2024

Following are the data in respect of LP enterprises for the year ended 31st March, 2024:

Debt to Total assets ratio	:	0.40
Long-term debts to equity ratio	:	30%
Gross profit margin on sales	:	20%
Accounts receivables period	:	36 days
Quick ratio	:	0.9
Inventory holding period	:	60 days
Cost of goods sold	:	Rs. 64,00,000

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	20,00,000	Fixed assets	
Reserves & surplus		Inventories	
Long-term debts		Accounts receivable	

Accounts payable		Cash	
Total	50,00,000	Total	

Required:

COMPLETE the Balance Sheet of LP enterprises as on 31st March, 2024. All calculations should be in nearest Rupee. Assume 360 days in a year.

SOLUTION :**Working Notes:**

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

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

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

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 - Rs. 20,00,000
So, Reserves & Surplus = Rs. 10,00,000
- (3)
$$\frac{\text{Long term Debt}}{\text{Equity Shareholders' Fund}} = 30\%$$

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

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 = $\frac{100}{80} \times 64,00,000 = 80,00,000$
- (6) Inventory Turnover = $\frac{360}{60}$

$$\frac{\text{COGS}}{\text{Closing inventory}} = \frac{360}{60}$$

$$\frac{64,00,000}{\text{Closing inventory}} = \frac{360}{60}$$

Closing inventory = 10,66,667
- (7) Accounts Receivable period = 36 days

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

Account Receivable = $\frac{36}{360} \times \text{Credit sales}$

$$= \frac{36}{360} \times 80,00,000 \text{ (assumed all sales are on credit)}$$

- Accounts Receivable** = Rs. 8,00,000
- (8) Quick Ratio = 0.9
- $\frac{\text{Quick Assets}}{\text{Current liabilities}}$ = 0.9
- $\frac{\text{Cash + Debtors}}{11,00,000}$ = 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 – (10,66,667 + 8,00,000 + 1,90,000)
- (10) = **29,43,333**

Balance Sheet of LP enterprises as on 31st March 2024

Liabilities	(Rs.)	Assets	(Rs.)
Share Capital	20,00,000	Fixed Assets	29,43,333
Reserved surplus	10,00,000	Current Assets:	
Long Term Debt	9,00,000	Inventory	10,66,667
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 24 : PAPER – SEPT 2024

Following information relates to MNP Limited for the year ended on 31st March, 2024:

Inventory turnover ratio (based on cost of goods sold)	7.5 times
Total assets turnover ratio	2.5 times
Long term debt to Shareholders' fund	0.6:1
Debtors collection period	30 days
Gross profit ratio	25% on sales
Current Ratio	2.9:1

Balance Sheet as on 31st March, 2024

Liabilities	Rs.	Assets	Rs.
Equity share capital	6,00,000	Fixed Assets	?
Reserves & Surplus	3,00,000	Inventories	?
Long term debt	?	Debtors	?
Creditors	3,00,000	Cash	?
Total		Total	

You are required to complete the Balance Sheet of MNP Limited as on 31st March, 2024. Assume a 360 days year and all sales are credit sales.

SOLUTION :**Working Notes:**

Long term debt to Shareholder's fund	= 0.6:1	
Long term debt	= 0.6 x Rs. 9,00,000	= Rs. 5,40,000
Total Assets		= Rs. 17,40,000
Total Asset turnover ratio	= $\frac{\text{Sales}}{\text{Total Sales}}$	= 2.5 times
Sales	= 2.5 x Rs. 17,40,000	= Rs. 43,50,000
Current Ratio	= $\frac{\text{Current Assets}}{\text{Current Liabilities}}$	= 2.91
Current Assets	= 2.9 x Rs. 3,00,000	= Rs. 8,70,000
Fixed Assets	= Total Assets - Current Assets	
	= Rs. 17,40,000 – Rs. 8,70,000 = Rs. 8,70,000	
Gross profit ratio	= 25% on sales	
Gross Profit (GP)	= Rs. 43,50,000 x 0.25 = Rs. 10,87,500	
Cost of Good Sold (COGS)	= Sales – GP	
	= Rs. 43,50,000 - Rs. 10,87,500	
	= Rs. 32,62,500	
Inventory Turnover Ratio	= $\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = 7.5 \text{ times}$	
Inventory	= Rs. 32,62,500/7.5	= Rs. 4,35,000
Debtor Collection Period	= $\frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}} = 30 \text{ days}$	
Receivables	= 30 days x Rs. 43,50,000/360 days = Rs. 3,62,500	

Balance Sheet as on 31st March 2024

Liabilities	Rs.		Rs.
Share Capital	6,00,000	Fixed Assets	8,70,000
Reserve and Surplus	3,00,000	Inventories	4,35,000
Long-term loan	5,40,000	Debtors	3,62,500
Creditors	3,00,000	Cash	72,500
		(Balancing Figure)	
	17,40,000		17,40,000

QUESTION 25 : RTP – JAN 2025

Vardhaman Limited gives you the following information related for the year ending 31st March, 2024:

Particulars	Amount (Rs.)
Current Ratio	03:01
Loan funds to Owned Funds Ratio	01:03
Gross Profit Ratio	25%
Stock Turnover Ratio	10

Net Working Capital	Rs. 5,00,000
Return on Total Assets (pre-tax)	15%
MPS	Rs. 20
Total Assets Turnover Ratio	2.5
Opening stock	Rs. 6,50,500
Fixed Assets	Rs. 15,00,000
75,000 equity shares of	Rs. 10 each
25,000, 12% Pref. Shares of	Rs. 10 each
Depreciation	Rs. 50,000
Interest on Debt	9%
Future Instalments	Rs. 2,00,000

Tax rate applicable to the company is 25%

You are required to CALCULATE:

- (i) Quick Ratio
- (ii) Fixed Assets Turnover Ratio
- (iii) Debt Service Coverage
- (iv) Earnings per Share
- (v) Price Earnings Ratio

SOLUTION :

WN 1: Calculation of Current Assets & Current Liabilities

Current Ratio = $CA / CL = 3:1$

Therefore, CA = 3CL

Net Working Capital = $CA - CL = 5,00,000$
 $= 3CL - CL = 5,00,000$

Therefore, CL = 2,50,000,

CA = 7,50,000

WN 2: Calculation of Average Stock Value & Closing Stock

Total Assets = Fixed Assets + Current Assets
 $= 15 \text{ L} + 7.5 \text{ L} = \mathbf{22.50 \text{ lakhs}}$

Total Assets Turnover Ratio = $\text{Sales} / \text{Total Assets} = 2.5$ (given)

Therefore Sales = $22.5 \text{ lakhs} \times 2.5$

Sales = **56,25,000**

GP Margin = 25%, therefore COGS = 75% of Sales

COGS = $56.25 \times 75\% = \mathbf{42,18,750}$

Stock Turnover Ratio = $\text{COGS} / \text{Average Stock} = 10$ (given)

Average Stock = $42,18,750 / 10 = \mathbf{4,21,875}$

Average Stock = $\text{Op. Stock} + \text{Cl. Stock} / 2$

4,21,875 = $6,50,500 + \text{Cl. Stock} / 2$

Cl Stock = 1,93,250

WN 3: Calculation of Cash Profit before Interest & Tax

Return on Total Assets (pre-tax) = $(\text{EBIT} / \text{Total Assets})$

$$0.15 = \text{EBIT} / 22.50 \text{ lakhs}$$

$$\text{Therefore, EBIT} = \mathbf{3,37,500}$$

$$\text{Cash Profit before Int \& Tax} = \text{EBIT} + \text{Depreciation}$$

$$= 337500 + 50000$$

$$\text{Cash Profit before Int \& Tax} = \mathbf{3,87,500}$$

WN 4 : Calculation of Loan Funds (Debt) & Owned Funds (Equity)

Debt to Equity = 1 : 3, which means 3 times Debt = Equity (Owned Funds)

As per the Accounting equation,

$$\text{Equity} + \text{Debt} + \text{Current Liab.} = \text{Fixed Assets} + \text{Current Assets}$$

$$3 \text{ Debt} + \text{Debt} + 2,50,000 = 15,00,000 + 7,50,000$$

$$4 \text{ Debt} = 20,00,000$$

$$\text{Therefore Debt (Loan Funds)} = \mathbf{5,00,000}$$

$$\text{Equity (Owned Funds)} = \mathbf{15,00,000}$$

WN 5: Calculation of Earnings Available to Eq. Share holders

Particulars	Amount (Rs.)
EBIT	3,37,500
(-) Int (5 lakhs x 9%)	(45,000)
EBT	2,92,500
(-) Tax @ 0.25	(73,125)
EAT	2,19,375
(-) Pref Div. (250000 x 12%)	(30,000)
Earnings For Eq. Sh Holders	1,89,375

$$1. \quad \text{Quick Ratio} = \{\text{CA} - \text{CL Stock}\} / \text{CL}$$

$$= 7,50,000 - 1,93,250 / 2,50,000$$

$$\text{Quick Ratio} = \mathbf{2.23 : 1}$$

$$2. \quad \text{Fixed Assets Turnover Ratio} = \text{Sales} / \text{Total Fixed Assets}$$

$$= 56,25,000 / 15,00,000$$

$$\text{Fixed Assets Turnover Ratio} = \mathbf{3.75 \text{ times}}$$

$$3. \quad \text{Debt Service Coverage Ratio} = \text{Cash profit before Int \& Tax} / \text{Int} + \text{Instalments}$$

$$= 3,87,500 / (45,000 + 2,00,000)$$

$$\text{Debt Service Coverage Ratio} = \mathbf{1.58 \text{ times.}}$$

$$4. \quad \text{EPS} = \text{Earnings for Eq. Shareholders} / \text{No of Eq. Shareholders}$$

$$= 1,89,375 / 75,000$$

$$\text{EPS} = \mathbf{Rs. 2.53}$$

$$5. \quad \text{Price to Earnings Ratio} = \text{MPS} / \text{EPS}$$

$$= 20 / 2.53$$

$$\text{Price to Earnings Ratio} = \mathbf{7.91 \text{ times}}$$

QUESTION 26 : PAPER – JAN 2025

The equity share capital of Sky Pack Ltd. as on 31st March, 2024 was Rs. 2,00,000. The relevant ratios of the company are as follows:

$$\text{Current debt to Total debt} = 0.35$$

$$\text{Total debt to Owner's equity} = 0.65$$

Fixed assets to Owner's equity	0.55
Total assets turnover	2.5 times
Inventory turnover	10 times

You are required to prepare the Balance Sheet of Sky Pack Ltd. as on 31st March, 2024.

SOLUTION :

Sky Pack Ltd Balance Sheet

Liabilities	Rs.	Assets	Rs.
Equity share capital	2,00,000	Fixed assets	1,10,000
Current debt	45,500	Cash (balancing figure)	1,37,500
Long term debt	84,500	Inventory	82,500
	3,30,000		3,30,000

Working Notes

- Total debt = 0.65 Equity share capital
= 0.65 x Rs. 2,00,000 = Rs. 1,30,000
Current debt to total debt = 0.35.
Current debt = 0.35 Rs. 1,30,000 = Rs.45,500
Long term debt = Rs.1,30,000 - Rs.45,500 = Rs. 84,500
- Fixed assets = 0.55 Equity share Capital
= 0.55 Rs. 2,00,000 = Rs. 1,10,000
- Total assets to turnover = 2.5 Times : Inventory turnover = 10 Times
Hence, Inventory /Total assets = 2.5/10=1/4, Total assets = Rs. 3,30,000
Therefore Inventory = Rs. 3,30,000/4 = Rs. 82,500

QUESTION 27 : RTP – MAY 2025

Using the information given below, PREPARE the Balance Sheet of Navy Private Limited–

Particulars	Details
Stock turnover Ratio	15 times
Cash and Bank balance	10% of Current Assets (net off prepaid exp)
GP Ratio	20%
Creditors turnover (cost of goods sold) ratio	10 times
Debtors turnover ratio	12 times
Net Fixed Assets	25% of Total Liabilities
Depreciation	15% on Opening WDV
Current Ratio	1.6 : 1
Capital Gearing Ratio	0.6 : 1

All Purchases and Sales are assumed to be on credit basis.

Balance Sheet of Navy Private Limited as of 31.03.2025

Particulars	Amount (Rs.)	Amount (Rs.)

A] Equities and Long Term Liabilities		
Share Capital	36,00,000	
Reserves and Surplus	??	
14% Bonds	??	???
B] Current Liabilities		
Trade Payables	??	
Outstanding expenses and provisions	??	
(*Net of Prepaid expenses of Rs.7,50,000)		45,00,000
TOTAL		?????
C] Fixed Assets		
Opening WDV	??	
(-) Depreciation	??	???
D] Current Assets		
Inventory	??	
Trade Receivables	??	
Cash and Bank Balance	??	???
TOTAL		?????

(All the working notes should form part of your answer)

SOLUTION :

Balance Sheet of Navy Private Limited as of 31.03.2025

Particulars	Notes	Amount (Rs.)	Amount (Rs.)
A] Equities and Long Term Liabilities			
Share Capital		36,00,000	
Reserves and Surplus	WN-7	1,18,750	
14% Bonds	Bal. Fig.	22,31,250	59,50,000
B] Current Liabilities			
Trade Payables	WN-6	40,30,244	
Outstanding expenses and provisions	Bal. Fig.	4,69,756	45,00,000
(*Net of Prepaid expenses of Rs. 7,50,000)			
TOTAL			1,04,50,000
C] Fixed Assets			
Opening WDV	WN-3	32,94,118	
(-) Depreciation	WN-3	-4,94,118	28,00,000 (WN-2)
D] Current Assets			
Inventory	WN-5	26,86,829	
Trade Receivables	WN-5	41,98,170	

Cash and Bank Balance	WN-4	7,65,000	76,50,000 (WN 1)
TOTAL			1,04,50,000

WN 1 – Calculation of Current Assets using Current Ratio

$$\text{Current Ratio} = \frac{\text{CA}}{\text{CL}}$$

$$\text{CL} = 45,00,000 + 7,50,000 = 52,50,000$$

$$1.6 = \text{CA} / 52,50,000$$

$$\text{Therefore CA} = 84,00,000$$

CA = Inventory + Trade Receivables + Cash Bank Balance + Prepaid Exp

$$84,00,000 = \text{Inventory} + \text{Trade Receivables} + \text{Cash Bank Balance} + 7,50,000$$

Therefore, total of Inventory + Trade Receivables + Cash Bank Balance = 76,50,000

WN 2 – Calculation of Fixed Assets & Total Assets

Fixed Assets = 25% of Total liabilities or 25% of Total Assets which means

Current Assets = 75% of Total liabilities or 75% of Total Assets

Fixed Assets + Current Assets = Total Assets/Total Liabilities

$$25 + 75 = 100$$

$$\text{Fixed Assets} = 84,00,000 \times 25/75 = 28,00,000$$

$$\text{Total Assets} = 1,12,00,000$$

WN 3 – Calculation of Depreciation and Opening WDV of Fixed Assets

Opening WDV - Depreciation = Closing WDV

$$100 - 15 = 85$$

$$\text{Therefore, Depreciation} = 28,00,000 \times 15/85 = 4,94,118$$

$$\text{Opening WDV} = 32,94,118$$

WN 4 – Calculation of Cash & Bank Balance

Cash & Bank Balance = 10% of (CA – Prepaid Exp)

Cash & Bank balance = 10% of (84,00,000 – 7,50,000)

Therefore, cash and bank balance = 7,65,000

WN 5 – Calculation of Inventory & Trade receivables

Total CA = Inventory + Trade Receivables + Cash Bank Balance + Prepaid Exp

$$84,00,000 = \text{Inventory} + \text{Trade Receivables} + 7,65,000 + 7,50,000$$

$$\text{Inventory} + \text{Trade Receivables} = 68,85,000$$

Now, Let Sales be X

$$\text{GP Ratio} = 20\% = 0.2X$$

$$\text{COGS} = 80\% = 0.8X$$

$$\text{Debtors T/O Ratio} = \frac{\text{Net Credit Sales}}{\text{Debtors}}$$

$$\begin{aligned}
 12 &= \frac{X}{\text{Debtors}} \\
 \text{Debtors} &= X / 12 \\
 \text{Inventory T/O Ratio} &= \text{COGS} / \text{Inventory} \\
 15 &= 0.8X / \text{Inventory} \\
 \text{Inventory} &= 0.8X / 15 \\
 \text{Inventory} + \text{Trade Receivables} &= 68,85,000 \\
 0.8X / 15 + X / 12 &= 68,85,000 \\
 \text{Therefore } X &= \text{Sales} = 5,03,78,050 \\
 \text{COGS} &= 4,03,02,440 \\
 \text{Trade Receivables} &= 41,98,170 \\
 \text{Inventory} &= 26,86,829
 \end{aligned}$$

WN 6 – Calculation of Trade Payables using Creditors Turnover Ratio

$$\begin{aligned}
 \text{Creditors T/O Ratio} &= \frac{\text{COGS}}{\text{Trade Payables}} \\
 10 &= \frac{4,03,02,440}{\text{Trade Payables}} \\
 \text{Trade Payables} &= 40,30,244
 \end{aligned}$$

WN 7 – Calculation of Reserves and Surplus & 14% Bonds

$$\begin{aligned}
 \text{Total Capital Employed} &= \text{Share Cap} + \text{R\&S} + \text{Bonds} \\
 \text{Capital Gearing Ratio} &= \text{Capital bearing Fixed \%} / \text{Capital not bearing fixed \%} \\
 0.6 &= \text{Bonds} / \text{Share Capital} + \text{R\&S} \\
 \text{Therefore, Bonds} &= 21,60,000 + 0.6 \text{ R\&S} \\
 \text{Substituting the value of bonds in the above equation,} \\
 \text{Total Capital Employed} &= \text{Share Cap} + \text{R\&S} + (21,60,000 + 0.6 \text{ R\&S}) \\
 59,50,000 &= 36,00,000 + 1.6 \text{ R\&S} + 21,60,000 \\
 \text{Therefore R\&S} &= 1,18,750
 \end{aligned}$$

QUESTION 28 : PAPER – MAY 2025

The following information is available for S Ltd. for the year ended 31st March, 2025:

Raw Material consumed	20% of COGS
Raw Material Inventory turnover ratio	4.00
Finished Goods Inventory holding period	0.75 month
Gross profit (based on COGS)	12.50%
Debtor collection period (all sales are credit sales)	3 months
Proprietary ratio	0.3125
Fixed Assets turnover ratio (based on sales)	3.00
Fixed Assets to Total Assets	40%

You are required to prepare a Balance Sheet as on 31st March, 2025 in the following format:

Liabilities	Rs.	Assets	Rs.
Shareholders' Fund (assume no Preference Shares)		Fixed Assets	12,00,000
Long-term Debt	15,00,000	Stock of Raw Material	
Current Liabilities		Stock of Finished Goods	
Total		Debtors	
		Cash	
		Total	

SOLUTION :

Workings:

(i) Calculation of Sales, Cost of Goods Sold and Gross Profit

$$\text{Fixed Assets Turnover} = \frac{\text{Sales}}{\text{Fixed Assets}}$$

$$3 = \frac{\text{Sales}}{12,00,000}$$

$$\text{So, Sales} = 12,00,000 \times 3 = \text{Rs. } 36,00,000$$

$$\text{And Cost of Goods Sold} = 36,00,000 \times \frac{100}{(100 + 12.5)} = \text{Rs. } 32,00,000$$

$$\text{Therefore, Gross Profit} = 32,00,000 \times 12.5\% = \text{Rs. } 4,00,000$$

(ii) Calculation of Stock of Raw Materials

$$\begin{aligned} \text{Raw Material Consumed} &= \text{COGS} \times 20\% \\ &= 32,00,000 \times 20\% \\ &= \text{Rs. } 6,40,000 \end{aligned}$$

$$\text{So, stock of raw material} = \frac{6,40,000}{4} = \text{Rs. } 1,60,000$$

(iii) Calculation of Debtors

$$\text{Debtor Collection Period} = \frac{12}{\text{Receivable Turnover Ratio}} = 3 \text{ months}$$

$$\begin{aligned} \text{Or Debtor} &= 36,00,000 \times \frac{3}{12} \\ &= \text{Rs. } 9,00,000 \end{aligned}$$

(iv) Calculation of Total Assets

$$\text{Total Asset} = \frac{\text{Fixed}}{40\%}$$

$$= 12,00,000 \times \frac{100}{40} = \text{Rs. } 30,00,000$$

$$\text{So Total Liabilities including shareholder's fund} = \text{Rs. } 30,00,000$$

(v) Calculation of Stock of Finished Goods

$$\text{Stock of Finished Goods} = 32,00,000 \times \frac{0.75}{12} = \text{Rs. } 2,00,000$$

(vi) Calculation of Current Assets and Fixed Assets

Current Assets = Total Assets – Fixed Assets

= 30,00,000 – 12,00,000 = Rs. 18,00,000

And Cash Balance = Current Assets – (Raw Material + Finished Goods + Debtors)

= 18,00,000 – (1,60,000 + 2,00,000 + 9,00,000)

= Rs. 5,40,000

(vii) Calculation of Shareholder's Fund

Proprietary Ratio = $\frac{\text{Shareholders Fund}}{\text{Total Funds}}$

0.3125 = $\frac{\text{Shareholders Fund}}{30,00,000}$

Shareholders Fund = Rs.9,37,500

Balance Sheet as on 31st March 2025

Liabilities	(Rs.)	Assets	(Rs.)
Shareholders' Fund	9,37,500	Fixed Assets	12,00,000
Long-term Debt	15,00,000	Stock of Raw Material	1,60,000
Current Liabilities	5,62,500	Stock of Finished Goods	2,00,000
(Balancing Figure)		Debtors	9,00,000
		Cash	5,40,000
	30,00,000		30,00,000

QUESTION 29 : RTP – SEPT 2025

Jamunapati Limited has furnished the following ratios and information relating to the year ended 31st March, 2024:

Sales	Rs. 70,00,000
Return on net worth	25%
Rate of income tax	30%
Share capital to reserves	7:3
Current ratio	2
Net profit to sales	7%
Inventory turnover	10
Cost of goods sold	Rs. 24,00,000
Interest on 15% debentures	Rs. 1,05,000
Receivables	Rs. 3,00,000
Payables	Rs. 3,00,000

You are required to:

- CALCULATE the operating expenses for the year ended 31st March, 2024.
- PREPARE a Balance Sheet as on 31st March, 2024 in the following format:

Balance Sheet as on 31st March, 2024

Liabilities	Rs.	Assets	Rs.
Share Capital		Fixed Assets	
Reserve and Surplus		Current Assets	

15% Debentures		Stock	
Payables		Receivables	
		Cash	

SOLUTION :**(a) Calculation of Operating Expenses for the year ended 31st March, 2024**

	(Rs.)
Net Profit [@ 7% of Sales]	4,90,000
Add: Income Tax (@ 30% of PBT)	2,10,000
Profit Before Tax (PBT)	7,00,000
Add: Debenture Interest	1,05,000
Profit before interest and tax (PBIT)	8,05,000
Now, Sales (given)	70,00,000
Less: Cost of goods sold	24,00,000
Gross Profit	46,00,000
Less: PBIT	8,05,000
Operating Expenses	37,95,000

(b) Balance Sheet as on 31st March, 2024

Liabilities	Rs.	Assets	Rs.
Share Capital	13,72,000	Fixed Assets	23,60,000
Reserve and Surplus	5,88,000	Current Assets:	
15% Debentures	70,00,000	Stock	2,40,000
Payables	3,00,000	Receivables	3,00,000
		Cash	60,000
	29,60,000		29,60,000

Working Notes:**(i) Share Capital and Reserves and Surplus**

The return on net worth is 25%. Therefore, the profit after tax of Rs. 4,90,000 should be equivalent to 25% of the net worth.

$$\text{Net worth} \times \frac{25}{100} = \text{Rs. } 4,90,000$$

$$\therefore \text{Net worth} = \frac{\text{Rs. } 4,90,000 \times 100}{25} = \text{Rs. } 19,60,000$$

The ratio of share capital to reserves is 7:3

$$\text{Share Capital} = 19,60,000 \times \frac{7}{10} = \text{Rs. } 13,72,000$$

$$\text{Reserves and Surplus} = 19,60,000 \times \frac{3}{10} = \text{Rs. } 5,88,000$$

(ii) Debentures

Interest on Debentures @ 15% = Rs. 1,05,000

$$\therefore \text{Debenture} = \frac{1,05,000 \times 100}{15} = \text{Rs. } 7,00,000$$

(iii) Current Assets

$$\begin{aligned}
 \text{Current Ratio} &= 2 \\
 \text{Payables} &= \text{Rs. } 3,00,000 \\
 \therefore \text{Current Assets} &= 2 \text{ Current Liabilities} \\
 &= 2 \times 3,00,000 \\
 &= \text{Rs. } 6,00,000
 \end{aligned}$$

It is assumed that current liabilities include payables only.

(iv) Fixed Assets

	Rs.
Share capital	13,72,000
Reserves and Surplus	5,88,000
Debentures	7,00,000
Payables	3,00,000
Total Liabilities	29,60,000
Less: Current Assets	6,00,000
Fixed Assets	23,60,000

(v) Composition of Current Assets

$$\text{Inventory Turnover} = 10$$

$$\frac{\text{Cost of goods sold}}{\text{Closing stock}} = 10$$

$$\text{Closing stock} = \frac{\text{Rs. } 24,00,000}{10} = \text{Rs. } 2,40,000$$

Composition	Rs.
Stock	2,40,000
Receivables	3,00,000
Cash (balancing figure)	60,000
Total Current Assets	6,00,000

QUESTION 30 : PAPER – SEPT 2025

Diwan Limited has outlined its financial projections for the fiscal year 2025-26. The company plans to utilize total assets amounting to Rs. 50,00,000, with 35% of assets financed through debt at interest rate of 10.50% per annum. Projected sales revenue is Rs. 55,00,000. Direct costs are estimated at Rs. 30,00,000 and other operating expenses are estimated at Rs.4,80,000. The applicable tax rate is 33%

You are required to calculate:

- Profit After Tax (PAT)
- Net profit margin (After tax)
- Return on Assets (After tax)
- Asset turnover ratio
- Return on Equity

SOLUTION :

(i) **Income Statement**

Particulars	Rs.
Sales	55,00,000
Less: Direct Cost	30,00,000
Gross Profit	25,00,000
Less: Operating Expenses	4,80,000
EBIT	20,20,000
Less: Interest (50,00,000 x 35% x 10.5%)	1,83,750
Profit Before Tax	18,36,250
Less: Tax @ 33%	6,05,963
Profit After Tax	12,30,287

- (ii) Net Profit Margin after tax = $\frac{\text{Net Profit after taxes}}{\text{Sales}}$
 $= \frac{12,30,287}{55,00,000} = 22.37\%$
OR
 $= \frac{\text{EBIT} (1 - t)}{\text{Sales}}$
 $= \frac{20,20,000 (1 - 0.33)}{55,00,000} = 24.61\%$
- (iii) Return on Assets (ROA) = $\frac{\text{EBIT} (1 - t)}{\text{Average total assets}}$
 $= \frac{20,20,000 (1 - 0.33)}{50,00,000} = 27.07\%$
- (iv) Asset turnover = $\frac{\text{Sales}}{\text{Assets}} = \frac{55,00,000}{50,00,000} = 1.1 \text{ times}$
- (v) Return on equity = $\frac{\text{Net profit after taxes}}{\text{Owner's equity}}$
 $= \frac{\text{Rs.12,30,287}}{65\% \text{ of Rs.50,00,000}}$
 $= \frac{12,30,287}{32,50,000} = 37.85\%$

QUESTION 31 : RTP – JAN 2026

ABC Industries Ltd, a listed company, is a renowned player in the pharmaceutical sector. The company has availed various credit facilities from X bank, namely, Cash Credit Facility, Term Loan(s), Working Capital Demand Loan, Bank Guarantee(s) / Letter of Credit. This strategic mix of various credit facilities showcases the company's balanced approach to leveraging and risk management. The company has totally 1 Lakh Equity Shares of Rs. 10 each outstanding. The company's shares are traded at a premium of 20%. The company's capital yields a healthy return rate, indicative of its operational efficiency and market competitiveness. However, it operates in

a high-tax environment with an income-tax rate of 50%, which significantly impacts its net earnings and available reinvestment capital.

At the beginning of the year 2024-25, the company went in for re-organisation of capital structure, with share capital remaining the same as follows:

- (a) Share capital - 40%,
- (b) 12% Preference Share Capital – 10%
- (c) Other Shareholders' funds - 15%
- (d) 15% Term Loan - 10%
- (e) Current Liabilities - 25%

Term Loan is repayable in 5 instalments starting from 31.03.2025. Since the first instalment is not yet paid, as part of periodic review by the Bank and in order to ensure compliance with their internal and regulatory requirements, the Bank requested the company to furnish a Financial Soundness Report duly certified by your Chartered Accountant/Auditor. The report should inter alia cover various Ratios that:

1. estimates whether the business can pay short term debts.
2. measures the ability to meet current debt immediately.
3. measures the ability to meet the commitment of various debt services like interest, instalment etc.
4. measures the ability of business to meet the interest obligations.
5. measures the ability of business to pay the preference dividend.
6. shows how many times the cash flow before interest and taxes covers all fixed financing charges.

The Chief Executive officer asked the Statutory auditor to prepare a reply letter quoting the proper ratio that covers the issues raised by the bank in this format –

Issue	Ratio	Numerator	Denominator	Ideal Ratio/ Range	Ratio of the Company	Favourable/ Adverse

Closing fixed assets after providing 20% Depreciation constituted 60% of the total assets. Current assets comprises Inventories, Advance Tax, Prepaid Insurance and Receivables. The receivables (one-fifth of the current assets) to sales ratio revealed a credit period of 2 months. There were no cash sales. Operating profit margin being 15%. Also find out the ratios that

1. indicates composition of capital structure in terms of debt and equity
2. measures overall profits generated for each share in existence.
3. indicates market response of the equity shareholders' investment.
4. Indicates expectations of the equity investors about the earnings of the firm.

SOLUTION :

Equity Share Capital	40% of Total = Given	10,00,000
Total Liabilities	10,00,000 / 40%	25,00,000
Preference Share Capital	25,00,000 x 10%	2,50,000
Other Shareholders' funds	25,00,000 x 15%	3,75,000

15% Term Loan	$25,00,000 \times 10\%$	2,50,000
Current Liabilities	$25,00,000 \times 25\%$	6,25,000
Total Assets	Total Liabilities	25,00,000
Fixed Assets	60% of Total	15,00,000
Depreciation	$\frac{15,00,000}{80\%} \times 20\%$	3,75,000
Current Assets	40% of Total	10,00,000
Receivables	1/5th of Current Assets	2,00,000
Stock, Advance Tax & Prepaid Insurance	Balance	8,00,000
Quick Assets	Only Receivables	2,00,000
Total Sales	$\frac{\text{Receivables}}{2} \times 12$	12,00,000
EBIT	$12,00,000 \times 15\%$	1,80,000
Interest	$2,50,000 \times 15\%$	37,500
EBT		1,42,500
PAT	$1,42,500 \times 50\%$	71,250
Preference dividend	$2,50,000 \times 12\%$	30,000
PAES		41,250
EPS (ratio measures overall profits generated for each share in existence)	$41,250 / 1,00,000$	0.41
Debt Equity ratio (indicates composition of capital structure in terms of debt and equity)	$2,50,000 / 16,25,000$	0.15
MPS	FV 10 + 20% Premium	12
Market value to Book value (indicates market response of the equity shareholders' investment)	$12 \text{ Lakhs} / 13.75 \text{ Lakhs}$	0.87
PE Ratio (indicates expectations of the equity investors about the earnings of the firm)	$12/0.41$	29.27 times

Issue	Ratio	Numerator	Denominator	Ideal Ratio / Range	Ratio of the Company	Favourable / Adverse
1	Current Ratio	Current Assets	Current Liabilities	2	1.6	Adverse
2	Quick Ratio	Quick Assets	Current Liabilities	1	0.32	Adverse
3	DSCR	Earnings available for Debt services	Interest & Instalments	2	6.1	Favourable
4	Interest coverage ratio	EBIT	Interest	> 1	4.8	Favourable
5	Preference Dividend coverage ratio	PAT	Preference dividend	> 1	2.375	Favourable

6	Fixed charges coverage ratio	EBIT + Depn	Interest + Repayment of loan	> 1	6.34	Favourable
7	Debt equity ratio	Debt	Equity	Not applicable	0.15	
8	EPS	Profit available for equity holders	No. of Equity Shares	Not applicable	0.41	
9	MV/BV	MV of Equity	BV of Equity Shares	Not applicable	0.87	

Earnings available for Debt services = PAT + Interest + Depreciation + Instalments
= 71,250 + 37,500 + 3,75,000 + 50,000 = 5,33,750

QUESTION 32 : PAPER – JAN 2026

From the books of AIL Limited following information is taken for the year 2024-25:

Gross profit margin (25% of Sales) Rs. 30,00,000

Inventory holding period 28 Days

Opening Inventory Rs. 8,00,000

Current Ratio 1.20

Quick Ratio 0.80

Selling & Distribution Expenses Rs. 12,00,000

Depreciation and other Non-cash Expenses Rs. 4,80,000

Assume 360 days in a year.

You are required to calculate:

- Inventory as on 31.03.2025
- Working Capital
- Basic Defense Interval

SOLUTION :

$$(i) \quad \text{Sales} = \frac{30,00,000}{0.25} = \text{Rs. } 1,20,00,000$$

Gross Profit = Rs. 30,00,000

Cost of goods sold (COGS) = Sales - Gross Profit = Rs. 90,00,000

$$\begin{aligned} \text{Average Inventory} &= \frac{\text{Cost of goods sold (COGS)}}{\text{Inventory Turnover}} \\ &= \frac{\text{Rs. } 90,00,000 \times 28}{360} = 7,00,000 \end{aligned}$$

$$\frac{\text{Opening Inventory} + \text{Closing Inventory}}{2} = 7,00,000$$

$$8,00,000 + \text{Closing Inventory} = 7,00,000 \times 2$$

$$\text{Closing Inventory} = \text{Rs. } 6,00,000$$

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

$$\text{Or, } \frac{(CA)}{(CL)} = \frac{1.2}{1}$$

$$\therefore CA = 1.2 CL \quad \text{.....(1)}$$

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

$$= \frac{\text{Current Assets} - 6,00,000}{\text{Current Liabilities}}$$

$$\text{Or, } 0.8CL = CA - 6,00,000$$

$$CA = 0.8CL + 600000 \quad \text{.....(2)}$$

Equating 1 and 2

$$1.2 CL = 0.8CL + 6,00,000$$

$$CL = \text{Rs. } 15,00,000$$

$$CA = 1.2 CL = \text{Rs. } 18,00,000$$

$$\text{Working Capital} = CA - CL = 18,00,000 - 15,00,000 = \text{Rs. } 3,00,000$$

$$\text{(iii) Basic Defense Interval Ratio} = \frac{\left(\begin{array}{l} \text{Cash and Bank balance +} \\ \text{Marketable Securities} \end{array} \right)}{\text{Operating Expenses (Cash)} \div \text{No. of days}}$$

Cash Operating Expenses = COGS + Selling and Dist. Exp – Depreciation and Non-cash expenditures

$$= 90,00,000 + 12,00,000 - 4,80,000$$

$$= \text{Rs. } 97,20,000$$

$$\text{Quick Assets} = 18,00,000 - 6,00,000 = \text{Rs. } 12,00,000$$

$$\text{Basic Defense Interval Ratio} = \frac{12,00,000}{97,20,000 \div 360} = \frac{12,00,000}{27,000} = 44.44$$

QUESTION 33 : RTP – MAY 2026

The following information pertains to P Limited for the year ended 31st March, 2025 :

Particulars	Amount / Ratio
Sales	Rs. 3,60,00,000
Rate of Income Tax	40%
Return on Net Worth	30%
Share Capital to Reserves Ratio	06:04
Current Ratio	02:01
Percentage of Net Profit to Sales	8%
Inventory Turnover (based on cost of goods sold)	12
Cost of goods sold	Rs. 1,44,00,000
Sundry Debtors	Rs. 12,00,000
Sundry Creditors	Rs. 16,00,000
Interest on 14% debentures	Rs. 3,36,000

You are required to CALCULATE:

(i) Operating Expenses

- (ii) Share Capital and Reserves
- (iii) Closing Stock
- (iv) Fixed Assets

SOLUTION :**(i) Operating Expenses**

Net Profit = 8% on Sales	Rs. 28,80,000
= 8% x Rs. 3,60,00,000	
Add: Income Tax = 40% x Rs. 28,80,000/60%	Rs. 19,20,000
Profit Before tax	Rs. 48,00,000
Add: Debenture Interest	Rs. 3,36,000
Profit before interest and tax	Rs. 51,36,000
Sales	Rs. 3,60,00,000
Less:	
Cost of goods sold Rs. 1,44,00,000	
Profit before interest & tax Rs. 51,36,000	Rs. 1,95,36,000
Operating Expenses	Rs. 1,64,64,000

(ii) Share Capital and Reserves

Return on Net worth is 30%, hence profit after tax of Rs. 28,80,000 is equivalent to 30% of Net Worth.

$$\text{Net worth} \times 30/100 = \text{Rs. } 28,80,000$$

$$\text{Net Worth} = 28,80,000 \times 100/30 = \text{Rs. } 96,00,000$$

$$\text{Ratio of Share Capital to Reserves} = 6:4$$

$$\text{Share Capital} = \text{Rs. } 96,00,000 \times 6/10 = \text{Rs. } 57,60,000$$

$$\text{Reserves} = \text{Rs. } 96,00,000 \times 4/10 = \text{Rs. } 38,40,000$$

(iii) Closing Stock

$$\text{Inventory Turnover (based on cost of goods sold)} = 12$$

$$\text{Cost of goods sold} = \text{Rs. } 1,44,00,000$$

$$\text{Inventory Turnover Ratio} = \text{Cost of goods sold/Closing Stock} = 12$$

$$12 = \text{Rs. } 1,44,00,000/\text{Closing Stock}$$

$$\text{Therefore, Closing Stock} = \text{Rs. } 1,44,00,000/12$$

$$= \text{Rs. } 12,00,000$$

(iv) Fixed Assets

Calculation of Total liabilities

$$\text{Interest on 14 \% Debentures} = \text{Rs. } 3,36,000$$

$$\text{Therefore debentures} = \frac{\text{Rs. } 3,36,000 \times 100}{14\%}$$

$$= \text{Rs. } 24,00,000$$

Total of Liabilities Side

Share Capital	Rs. 57,60,000

Reserves	Rs. 38,40,000
Debentures	Rs. 24,00,000
Sundry Creditors	Rs. 16,00,000
Total Liabilities	Rs. 1,36,00,000

$$\begin{aligned}
 \text{Current Ratio} &= 2:1 \\
 \text{Sundry Creditors} &= \text{Rs. } 16,00,000 \\
 \frac{\text{Current Assets}}{\text{Current Liabilities}} &= 2 \\
 \frac{\text{Current Assets}}{\text{Sundry Creditors}} &= 2 \\
 \frac{\text{Current Assets}}{\text{Rs. } 16,00,000} &= 2 \\
 \text{Current Assets} &= 2 \times \text{Rs. } 16,00,000 \\
 &= \text{Rs. } 32,00,000 \\
 \text{Fixed Assets} &= \text{Total Liabilities} - \text{Current Assets} \\
 &= \text{Rs. } 1,36,00,000 - \text{Rs. } 32,00,000 \\
 &= \text{Rs. } 1,04,00,000
 \end{aligned}$$

QUESTION 34 : PAPER – MAY 2026

Following information is related to Exe Ltd. for the year ended 31st March, 2026:

Total dividend coverage ratio	2.863 times
Dividend yield on the equity shares	4%
Market price per equity share	Rs. 40.00
Equity share capital of 10 each	12,00,000
Preference share capital of 10 each	Rs. 3,00,000
Price-earnings ratio	8 times

You are required to calculate:

- Total dividend paid to equity shareholders
- Earnings per share
- Rate of preference dividend
- Total profit after tax

SOLUTION :

Dividend per Equity Share (DPS) = 4 % of Rs.40.00 = Rs.1.60

No. of Equity Shares = Rs.12,00,000 / Rs.10 = 1,20,000 shares

- Total Dividend Paid to Equity Shareholders**
 $1,20,000 \times \text{Rs. } 1.60 = \text{Rs. } 1,92,000$

- Calculation of Earnings Per Share (EPS)**

$$\begin{aligned}
 \text{P/E ratio} &= \frac{\text{MPS}}{\text{EPS}} \\
 8 &= 40 / \text{EPS} \\
 \text{EPS} &= \text{Rs. } 5
 \end{aligned}$$

- Rate of Preference Dividend**

Profit Available to Equity Shareholders

$$\text{EPS} \times \text{No. of Equity Shares} = \text{Rs.} 5 \times 1,20,000 = \text{Rs.} 6,00,000$$

$$\text{Let preference dividend} = P$$

$$\text{Then, PAT} = 6,00,000 + P$$

$$\begin{aligned} \text{Total dividend} &= \text{Equity Dividend} + \text{Preference Dividend} \\ &= 1,92,000 + P \end{aligned}$$

$$\text{Dividend coverage ratio} = 2.863$$

$$2.863 = \frac{(6,00,000 + P)}{(1,92,000 + P)}$$

$$6,00,000 + P = 2.863(1,92,000 + P)$$

$$6,00,000 + P = 5,49,696 + 2.863P$$

$$50,304 = 1.863P$$

$$P = \text{Rs. } 27,000$$

$$\text{Rate of Preference Dividend} = 27,000 / 3,00,000 \times 100 = 9\%$$

(iv) Total Profit after Tax

$$\text{PAT} = \text{Rs.} 6,00,000 + \text{Rs.} 27,000 = \text{Rs.} 6,27,000$$

QUESTION 35 : RTP – SEPT 2026

The following information of ASD Ltd. relate to the year ended 31st March, 2026:

Net profit	8% of sales
Raw materials consumed	20% of Cost of Goods Sold
Direct wages	10% of Cost of Goods Sold
Stock of raw materials	3 months' usage
Stock of finished goods	6% of Cost of Goods Sold
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-

- (a) Profit & Loss Statement of ASD Limited for the year ended 31st March, 2026 in the following format.

Particulars	(Rs.)	Particulars	(Rs.)
To Direct Materials consumed	?	By Sales	?
To Direct Wages	?		
To Works (Overhead)	?		
To Gross Profit c/d	?		
	?		?
To Selling and Distribution Expenses	?	By Gross Profit b/d	?

To Net Profit	?		
	?		?

(b) Balance Sheet as on 31st March, 2026 in the following format.

Liabilities	(Rs.)	Assets	(Rs.)
Share Capital	?	Fixed Assets	1,30,00,000
Reserves and Surplus	?	Current Assets:	
Long term loans	?	Stock of Raw Material	?
Current liabilities	?	Stock of Finished Goods	?
		Debtors	?
		Cash	?
	?		?

SOLUTION :

Working Notes:

(i) Calculation of Sales

$$\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$$

$$\therefore \frac{1,30,00,000}{\text{Sales}} = \frac{1}{3} \Rightarrow \text{Sales} = \text{Rs. } 3,90,00,000$$

(ii) Calculation of Current Assets

$$\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11}$$

$$\therefore \frac{1,30,00,000}{\text{Current Assets}} = \frac{13}{11} \Rightarrow \text{Current Assets} = \text{Rs. } 1,10,00,000$$

(iii) Calculation of Raw Material Consumption and Direct Wages

	Rs.
Sales	3,90,00,000
Less: Gross Profit (15 % of Sales)	<u>58,50,000</u>
Cost of Goods sold	<u>3,31,50,000</u>

Raw Material Consumption (20% of Cost of Goods Sold) Rs. 66,30,000

Direct Wages (10% of Cost of Goods Sold) Rs. 33,15,000

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

$$= 66,30,000 \times \frac{3}{12} = \text{Rs. } 16,57,500$$

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

$$= 3,31,50,000 \times \frac{6}{100} = \text{Rs. } 19,89,000$$

(vi) Calculation of Current Liabilities

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

$$\frac{1,10,00,000}{\text{Current Liabilities}} = 2 \Rightarrow \text{Current Liabilities} = \text{Rs. } 55,00,000$$

(vii) Calculation of Debtors

$$\text{Average collection period} = \frac{\text{Debtors}}{\text{Credit Sales}} \times 12 \text{ months}$$

$$\frac{\text{Debtors}}{3,90,00,000} \times 12 = 2 \Rightarrow \text{Debtors} = \text{Rs. } 65,00,000$$

(viii) Calculation of Long-term Loan

$$\frac{\text{Long term Loan}}{\text{Current Liabilities}} = \frac{2}{1}$$

$$\frac{\text{Long term Loan}}{55,00,000} = \frac{2}{1} \Rightarrow \text{Long term loan} = \text{Rs. } 1,10,00,000$$

(ix) Calculation of Cash Balance

		Rs.
Current assets		1,10,00,000
Less: Debtors	65,00,000	
Raw materials stock	16,57,500	
Finished goods stock	<u>19,89,000</u>	<u>1,01,46,500</u>
Cash balance		<u>8,53,500</u>

(x) Calculation of Net worth

		Rs.
Fixed Assets		1,30,00,000
Current Assets		1,10,00,000
Total Assets		2,40,00,000
Less: Long term Loan	1,10,00,000	
Current Liabilities	<u>55,00,000</u>	<u>1,65,00,000</u>
Net worth		75,00,000

Net worth = Share capital + Reserves = Rs. 75,00,000

$$\frac{\text{Capital}}{\text{Reserve and Surplus}} = \frac{1}{4} \Rightarrow \text{Share Capital} = \text{Rs. } 75,00,000 \times \frac{1}{5}$$

$$= \text{Rs. } 15,00,000$$

$$\text{Reserves and Surplus} = \text{Rs. } 75,00,000 \times \frac{4}{5} = \text{Rs. } 60,00,000$$

**Profit and Loss Statement of ASD Ltd.
for the year ended 31st March, 2026**

Particulars	(Rs.)	Particulars	(Rs.)
To Direct Materials consumed	66,30,000	By Sales	
To Direct Wages	33,15,000		
To Works (Overhead) (Bal. fig.)	2,32,05,000		

To Gross Profit c/d (15% of Sales)	58,50,000		
	3,90,00,000		3,90,00,000
To Selling and Distribution Expenses (Bal. fig.)		By Gross Profit b/d	
To Net Profit (8% of Sales)			
	58,50,000		58,50,000

Balance Sheet of ASD Ltd. as at 31st March, 2026

Particulars	(Rs.)	Particulars	(Rs.)
Share Capital	15,00,000	Fixed Assets	1,30,00,000
Reserves and Surplus	60,00,000	Current Assets:	
Long term loans	1,10,00,000	Stock of Raw Material	16,57,500
Current liabilities	55,00,000	Stock of Finished Goods	19,89,000
		Debtors	65,00,000
		Cash	8,53,500
	2,40,00,000		2,40,00,000

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

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

SOLUTION :

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

Calculation of EBT: Rs.

Sales	75,00,000
Less: Variable costs	<u>42,00,000</u>
Contribution	33,00,000
Less: Fixed costs	<u>6,00,000</u>
EBIT	27,00,000
Less: Interest (12 % of Rs. 45,00,000)	<u>5,40,000</u>
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

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

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

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

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

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

OR

$$\text{DCL} = \text{DOL} \times \text{DFL} = 1.22 \times 1.25 = 1.53$$

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:

$$\text{Rs. } 75,00,000 \times (1 - 0.6536) = \text{Rs. } 25,98,000 \text{ (approx.)}$$

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 = $30 \times 2.5 = \text{Rs. } 75 \text{ crores}$

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

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

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

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

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

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

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

(iv) Combined Leverage

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

Or,

= Operating Leverage × Financial Leverage

$$= 1.25 \times 1.103 = 1.379$$

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 :

- The percentage increase in earnings per share;
- 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	$\frac{4}{5} \times 100 = 80\%$	
(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	<u>Rs. 60,000</u>
	2,40,000
Non-current liabilities 10% debt	2,40,000
Current liabilities	1,20,000
	<u>6,00,000</u>

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. $= \frac{\text{Total Sales}}{\text{Total Assets}} = 4$

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**

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

- (b) **Degree of Financial Leverage**

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

- (c) **Degree of Combined Leverage**

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

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

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

$$= 1.263 \times 1.033 = 1.304 \text{ (approx.)}$$

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

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

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

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

(b) If EPS is Rs. 2

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

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

(c) IF EPS is Rs. 0

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

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%	<u>2,00,000</u>
Contribution	3,00,000
(-) Fixed cost	<u>2,00,000</u>
EBIT	1,00,000
(-) Interest	<u>25,000</u>
Profit before tax	<u>75,000</u>

Using the concept of leverage, find out

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

Also verify the results in each of the above case.

SOLUTION :

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

So, If EBIT increases by 10% then Taxable Income (EBT) will be increased by $1.333 \times 10 = 13.33\%$ (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) = $\frac{\text{Rs. } 10,000}{\text{Rs. } 75,000} \times 100 = 13.333\%$, hence verified

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

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

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 = $\frac{\text{Rs. } 30,000}{\text{Rs. } 1,00,000} \times 100 = 30\%$, hence verified.

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

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

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) = $\frac{\text{Rs. 30,000}}{\text{Rs. 75,000}} \times 100 = 40\%$, 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:

- CALCULATE the operating leverage and financial leverage.
- FIND out the combinations of operating and financial leverage which give the highest value and the least value.

SOLUTION :

- Operating Leverage

	Situation 1	Situation 2	Situation 3
	(Rs.)	(Rs.)	(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 = $\frac{C}{EBIT}$	$\frac{\text{Rs } 24,000}{\text{Rs } 21,000} = 1.14$	$\frac{\text{Rs } 24,000}{\text{Rs } 18,000} = 1.33$	$\frac{\text{Rs } 24,000}{\text{Rs } 15,000} = 1.60$

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	$\frac{Rs\ 18,000}{Rs\ 16,200} = 1.11$	$\frac{Rs\ 18,000}{Rs\ 17,100} = 1.05$
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

$$CL = OL \times FL$$

	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 I 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

- Operating Leverage
- Combined Leverage
- Earnings per share
- Earnings Yield

SOLUTION :

Workings:

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

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

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

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

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

$$\text{EBT} = \text{Rs. 9,71,223}$$

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

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

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

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

$$= 1.556 \times 1.39 = 2.163 \text{ (approx.)}$$

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

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

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

iv. **Earning Yield**

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

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:

- The percentage change in taxable income if sales increase by 15%.
- The percentage change in EBIT if sales decrease by 10%.
- The percentage change in taxable income if EBIT increase by 15%.

SOLUTION :

Workings:

- Contribution = Sales x P/V ratio

$$= 15,00,000 \times 70\% = 10,50,000$$
- Operating Leverage =
$$\frac{\text{Contribution}}{\text{Earnings before interest and Tax (EBIT)}}$$

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

 EBIT = Rs. 7,50,000
- Financial Leverage =
$$\frac{\text{EBIT}}{\text{EBT}}$$

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

 EBT = Rs. 6,00,000
- Fixed Cost = Contribution 3 EBIT

$$= 15,00,000 - 7,50,000 = 7,50,000$$
- Interest = EBIT 3 EBT

$$= ₹ 7,50,000 - ₹ 6,00,000 = ₹ 1,50,000$$

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 = $\frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs } 10,50,000}{\text{Rs } 6,00,000} = 1.75 \text{ times}$

Or, Combined Leverage = Operating Leverage x Financial Leverage

$$= 1.4 \times 1.25 = \mathbf{1.75 \text{ times}}$$

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

$$\text{Increase in Earnings before tax (EBT)} = ₹ 7,57,500 - ₹ 6,00,000 = ₹ 1,57,500$$

So, percentage change in Taxable Income (EBT) = $\frac{\text{Rs } 1,57,500}{\text{Rs } 6,00,000} \times 100 = 26.25\%$, 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 (Rs 15,00,000 - 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

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

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

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

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

Verification

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

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

So, percentage change in Taxable Income (EBT) = $\frac{\text{Rs } 1,12,500}{\text{Rs } 6,00,000} \times 100 = 18.75\%$, 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 = $30 \times 2.5 = \text{Rs. } 75 \text{ Crores}$

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

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

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

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

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

(iv) Combined Leverage

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

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

$$\text{So, } \frac{\text{Contribution}}{\text{EBIT}} = 4$$

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

$$\text{So, } \text{Sales} = \frac{\text{Rs. 7,20,000}}{60\%} = \text{Rs. 12,00,000}$$

Contribution = Sales – Variable Cost = Rs. 12,00,000 – Rs. 6,00,000 = Rs. 6,00,000

$$\text{EBIT} = \frac{\text{Rs. 6,00,000}}{4} = \text{Rs. 1,50,000}$$

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.
$$\text{Financial Leverage} = \frac{EBIT}{EBT} = \frac{1,50,000}{1,20,000} = 1.25 \text{ times}$$

Combined Leverage = Operating Leverage × Financial Leverage
 = 4 × 1.25 = **5 times**

OR,

$$\text{Combined Leverage} = \frac{\text{Contribution}}{EBIT} \times \frac{EBIT}{EBT}$$

$$\text{Combined Leverage} = \frac{\text{Contribution}}{EBIT} = \frac{\text{Rs.6,00,000}}{\text{Rs.1,20,000}} = 5 \text{ times}$$

iii. Percentage Change in Earnings per share

$$\text{Combined Leverage} = \frac{\% \text{ Change in EPS}}{\% \text{ Change in Sales}} = 5 = \frac{\% \text{ change in EPS}}{5\%}$$

$$\therefore \% \text{ Change in EPS} = 25\%$$

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:

- Determine company's Return on Capital Employed (Pre-tax) and EPS
- Does the company have a favorable financial leverage?
- Calculate operating and combined leverage of the company
- Calculate percentage change in EBIT, if sales increases by 10%
- 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

$$\begin{aligned}
 \text{(i) ROCE (Pre-tax)} &= \frac{EBIT}{\text{Capital employed}} \times 100 = \frac{EBIT}{\text{Equity} + \text{Debt}} \times 100 \\
 &= \frac{\text{Rs. } 20,10,000}{\text{Rs. } (75,00,00 + 55,00,000)} \times 100 = 15.46\%
 \end{aligned}$$

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:

$$\text{Operating Leverage} = \frac{\text{Contribution}}{EBIT} = \frac{\text{Rs. } 30,10,000}{\text{Rs. } 20,10,000} = 1.497 \text{ (approx)}$$

$$\text{Financial Leverage} = \frac{EBIT}{EBT} = \frac{\text{Rs. } 20,10,000}{\text{Rs. } 14,60,000} = 1.377 \text{ (approx)}$$

$$\text{Combined Leverage} = \frac{\text{Contribution}}{EBT} = \frac{\text{Rs. } 30,10,000}{\text{Rs. } 14,60,000} = 2.062 \text{ (approx)}$$

$$\text{Or, } = \text{Operating Leverage} \times \text{Financial Leverage} = 1.497 \times 1.377 = 2.06 \text{ (approx.)}$$

(iv) Operating leverage is 1.497. So, if sales are increased by 10%.

EBIT will be increased by $1.497 \times 10\%$ 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.

$$\begin{aligned}
 \text{Accordingly, New Sales} &= \text{Rs. } 86,00,000 \times (1 - 0.4850) \\
 &= \text{Rs. } 86,00,000 \times 0.515 \\
 &= \text{Rs. } 44,29,000 \text{ (approx.)}
 \end{aligned}$$

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 = $(5.6/70) \times 100$ 8%
 Loan amount Rs. 1,25,000
 Interest amount = $1,25,000 \times 8\%$ Rs. 10,000

$$\text{Financial Leverage (FL)} = \left(\frac{EBIT}{EBT} \right) = \left[\frac{EBIT}{(EBIT - \text{Interest})} \right] = \left[\frac{EBIT}{(EBIT - 10,000)} \right]$$

$$1.5 = \left[\frac{EBIT}{(EBIT - 10,000)} \right]$$

$$1.5 \text{ EBIT} - 15,000 = \text{EBIT}$$

$$1.5 \text{ EBIT} - \text{EBIT} = 15,000$$

$$0.5 \text{ EBIT} = 15,000$$

$$\therefore \text{EBIT} = \text{Rs. 30,000}$$

$$\text{EBT} = \text{EBIT} - \text{Interest} = 30,000 - 10,000 = \text{Rs. 20,000}$$

$$\begin{aligned} 2. \quad \text{Operating Leverage (OL)} &= \frac{\text{Contribution}}{\text{EBIT}} \\ 2 &= \frac{\text{Contribution}}{30,000} \end{aligned}$$

$$\text{Contribution} = \text{Rs. 60,000}$$

$$\begin{aligned} 3. \quad \text{Fixed cost} &= \text{Contribution} - \text{Profit} \\ &= 60,000 - 30,000 = \text{Rs. 30,000} \end{aligned}$$

4. Sales = $\frac{\text{Contribution}}{\text{PV Ratio}}$
 $= \frac{60,000}{30\%} \text{ Rs. } 2,00,000$
5. If PV ratio is 30%, then the variable cost is 70% on sales
 $\therefore \text{Variable cost} = 2,00,000 \times 70\% = \text{Rs. } 1,40,000$

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,

$$EPS = \frac{MPS}{PER} = \frac{140}{10} = \text{Rs. } 14$$

Total earnings (EAT) = Rs. 14,000

 $\therefore \text{No. of Equity Shares} = 14,000 / 14 = 1000$ **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
 $= \text{Rs. } 1,36,000$

(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

$$\frac{EBIT}{EBT} = \frac{1,36,000}{EBT} = 0.8$$

(iv) Financial Leverage =

$$\text{So, EBT} = \frac{1,36,000}{0.80} = \text{Rs. } 1,70,000$$

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:

$$(i) \quad \text{Degree of Financial Leverage} = \frac{EBIT}{EBIT - \text{INTEREST}}$$

$$DFL \times (EBIT - \text{Int}) = EBIT$$

$$DFL \times EBIT - \text{Int} \times DFL = EBIT$$

$$DFL \times EBIT - EBIT = \text{Int} \times DFL$$

$$EBIT(DFL - 1) = \text{Int} \times DFL$$

$$EBIT = \frac{\text{int} \times DFL}{DFL - 1}$$

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,

$$EBIT\ B = \frac{Rs\ 6,00,000 \times 2.5}{2.5 - 1}$$

$$EBITB = Rs. 1000000$$

$$(ii) \quad DOL = \frac{\text{Contribution}}{EBIT}$$

$$\text{Contribution} = DOL \times EBIT$$

$$\text{Contribution} = 4 \times 1,50,000$$

$$\text{Contribution A} = 6,00,000$$

$$\text{Contribution B} = 15,00,000$$

$$\text{Contribution C} = 25,00,000$$

$$(iii) \quad \text{Fixed Cost} = \text{Contribution} - EBIT$$

$$\text{Fixed Cost A} = 6,00,000 - 1,50,000 = Rs\ 4,50,000$$

$$\text{Fixed Cost B} = 15,00,000 - 5,00,000 = Rs\ 10,00,000$$

$$\text{Fixed Cost C} = 25,00,000 - 10,00,000 = Rs\ 15,00,000$$

$$(iv) \quad \text{Contribution} = \text{Sales} - VC$$

$$\text{Sales A} = 6,00,000 / 40\% = 15,00,000$$

$$\text{Sales B} = 15,00,000 / 50\% = 30,00,000$$

$$\text{Sales C} = 25,00,000 / 40\% = 62,50,000$$

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:

- Calculate P/V ratio and Earnings Per Share (EPS)
- If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?
- Financial Leverage

SOLUTION :

I) P/V Ratio and Earnings Per Share (EPS) :

$$\text{Operating leverage} = \frac{\text{Contribution (C)}}{\text{Contribution} - \text{Fixed Cost (F)}}$$

$$1.4 = \frac{C}{C - 2,04,000}$$

$$\text{Or, } C = 1.4 (C - 2,04,000)$$

$$\text{Or, } C = 1.4 C - 2,85,600$$

$$\text{Or, Contribution} = 7,14,000$$

$$\text{Now, P/V Ratio} = \frac{\text{Contribution (C)}}{\text{Sales (S)}} \times 100 = \frac{7,14,000}{30,00,000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = 23.80%

$$\begin{aligned} \text{EBT} &= \text{Contribution} - \text{Fixed Cost} - \text{interest} \\ &= 7,14,000 - 2,04,000 - (12\% \times 21,25,000) \\ &= 5,10,000 - 2,55,000 \\ &= 2,55,000 \end{aligned}$$

$$\text{PAT} = \text{EBT} (1-T) = 2,55,000 (1-0.3) = 1,78,500$$

$$\text{EPS} = \frac{\text{Profit After Tax}}{\text{No of Equity Shares}}$$

$$\text{EPS} = \frac{1,78,500}{1,70,000 \text{ Shares}} = 1.05$$

II) Assets turnover :

$$\text{Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{30,00,000}{17,00,000 + 21,25,000} = 0.7843$$

0.7843 < 1.5 means lower than industry turnover.

*Total Assets = Equity Share capital + 12% Debentures

III) Financial Leverage :

$$\begin{aligned}\text{Combined Leverage} &= \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)} \\ 2.8 &= 1.4 \times \text{FL} \\ \text{Or, FL} &= 2\end{aligned}$$

$$\text{Financial Leverage} = 2$$

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 expects 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%.

SOLUTION :**Income Statement with required calculations**

Particulars	(Rs.) Existing	(Rs.) Sales declined by 15%	(Rs.) Sales declined by 20%
Sales in units	50,00,000	42,50,000	40,00,000
Sales price per unit	20	20	20
Variable Cost per unit	(12.50)	(12.50)	(12.50)
Contribution per unit	7.5	7.5	7.5
Contribution	3,75,00,000	3,18,75,000	3,00,00,000
Fixed expenses	(1,75,00,000)	(1,75,00,000)	(1,75,00,000)
EBIT	2,00,00,000	1,43,75,000	1,25,00,000
Debenture Interest	(11,25,000)	(11,25,000)	(11,25,000)
EBT	1,88,75,000	1,32,50,000	1,13,75,000
Tax @ 20%	(37,75,000)	(26,50,000)	(22,75,000)
Profit after tax (PAT)	1,51,00,000	1,06,00,000	91,00,000
No. of shares	25,000	25,000	25,000
Earnings per share (EPS)	<u>Rs.1,51,00,000</u>	<u>Rs.1,06,00,000</u>	<u>Rs.91,00,000</u>
= $\frac{\text{PAT}}{\text{No. of shares}}$	25,000	25,000	25,000
	= Rs.604	= Rs.424	= Rs.364
(i) Decrease in EPS		= Rs.180	= Rs.240

(ii) Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	=	Or % Decrease in $\text{EPS} = \frac{180}{604} \times 100$ = 29.80%	Or % Decrease in $\text{EPS} = \frac{240}{604} \times 100$ = 39.73%
		$= \frac{\text{Rs.} 3,18,75,000}{\text{Rs.} 1,43,75,000}$ = 2.22	$= \frac{\text{Rs.} 3,18,75,000}{\text{Rs.} 1,43,75,000}$ = 2.40
Or Degree of Operating leverage = $\frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$		Or 28.125/15 = 1.875	Or 37.50/20 1.875
(iii) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$		$= \frac{\text{Rs.} 1,43,75,000}{\text{Rs.} 1,32,50,000}$ = 1.08	$= \frac{\text{Rs.} 1,25,00,000}{\text{Rs.} 1,13,75,000}$ = 1.10
Or Degree of Financial Leverage = $\frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$		Or 29.80/28.125 = 1.06	Or 39.733/37.50 = 1.06

QUESTION 17 : RTP – SEPT 2024

Following data of PC 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	Rs. 15,000	Rs. 22,500
Debt	Rs. 15,000	Rs. 7,500
Cost of Debt	12%	12%

Required:

- CALCULATE the operating leverage and financial leverage.
- 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)	3,000	6,000	9,000
EBIT	21,000	18,000	15,000
Operating Leverage	$\frac{\text{Rs.24,000}}{\text{Rs.21,000}}$	$\frac{\text{Rs.24,000}}{\text{Rs.18,000}}$	$\frac{\text{Rs.24,000}}{\text{Rs.15,000}}$
$= \frac{C}{\text{EBIT}}$	= 1.14	= 1.33	= 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 = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{\text{Rs.21,000}}{\text{Rs.19,200}} = 1.09$	$\frac{\text{Rs.21,000}}{\text{Rs.20,100}} = 1.04$
Situation 2		
EBIT	18,000	18,000
Less: Interest on debt	1,800	900
EBT	16,200	17,100
Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{\text{Rs.18,000}}{\text{Rs.16,200}} = 1.11$	$\frac{\text{Rs.18,000}}{\text{Rs.17,100}} = 1.05$
Situation 3		
EBIT	15,000	15,000
Less: Interest on debt	1,800	900
EBT	13,200	14,100
Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{\text{Rs.15,000}}{\text{Rs.13,200}} = 1.14$	$\frac{\text{Rs.15,000}}{\text{Rs.14,100}} = 1.06$

(ii) Combined Leverages

$$CL = OL \times FL$$

		Financial Plan

		A (Rs.)	B (Rs.)
(a)	Situation 1	$1.14 \times 1.09 = 1.24$	$1.14 \times 1.04 = 1.19$
(b)	Situation 2	$1.33 \times 1.11 = 1.48$	$1.33 \times 1.05 = 1.40$
(c)	Situation 3	$1.60 \times 1.14 = 1.82$	$1.60 \times 1.06 = 1.70$

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 Plan B.

QUESTION 18 : PAPER – SEPT 2024

Financial information for the year 2023-24 of two companies, N Limited and C Limited are as under :

Details	N Limited	C Limited
Equity share capital (Rs. 100 each)	Rs. 10,00,000	Rs. 8,00,000
Debt	Rs. 5,00,000@10%	Rs. 7,00,000@8%
Fixed Cost	3,00,000	3,36,000
Combined Leverage	8	4.5
Financial Leverage	2	1.5

You are required to calculate:

- Contribution for N Ltd. and C Ltd.
- Margin of safety in % for N Ltd. and C. Ltd.
- Sales of C Ltd.

SOLUTION :

(i) Calculation of Contribution

N Limited	C Limited
Financial Leverage (FL)	
$= \frac{EBIT}{EBT}$ or $\frac{EBIT}{EBIT - Interest}$	
$2 = \frac{EBIT}{EBIT - 50,000}$	$1.5 = \frac{EBIT}{EBIT - 56,000}$
$2 EBIT - 1,00,000 = EBIT$	$1.5 EBIT - 84,000 = EBIT$
$EBIT = Rs. 1,00,000$	$EBIT = Rs. 1,68,000$
$EBT = Rs. 50,000$	$EBT = 1,12,000$
Combined Leverage (CL)	
$= \frac{Contribution}{EBT}$	
$8 = Contribution / 50,000$	$4.5 = Contribution / 1,12,000$
Contribution = Rs. 4,00,000	Contribution = Rs. 5,04,000

(ii) Calculation of Margin of safety (MOS) in %

$$MOS = \frac{Contribution - Fixed cost}{Contribution} = \frac{EBIT}{Contribution}$$

N Limited	C Limited
MOS = 1,00,000/4,00,000 = 25%	MOS = 1,68,000/5,04,000 = 33.33%

Part (ii) can also be presented in following way:

Calculation of Margin of safety (MOS) in %

MOS = 1/operating leverage (OL)

OL = CL/FL

N Limited	C Limited
OL = 8/2 = 4	OL = 4.5/1.5 = 3
MOS = 1/4 = 25%	MOS = 1/3 = 33.33%

(iii) Sales of C Limited

Let assume that PV ratio is 40%

$$\text{PV Ratio} = \frac{\text{Contribution}}{\text{Sales or Sales}} = \frac{\text{Contribution}}{\text{PV Ratio}}$$

$$\text{Sales} = \frac{5,04,000}{0.40} = \text{Rs.12,60,000}$$

Part (iii) of the solution can be solved by any alternative assumption.

QUESTION 19 : RTP – JAN 2025

From the following financial data of Company X and Company Y:

- PREPARE their Income Statements.
- CALCULATE Margin of Safety for both the Companies
- CALCULATE Percentage change in EPS for both the companies, if percentage change in sales is 25%

(in Rs.)

	Company X	Company Y
Variable Cost	72,000	65% of Sales
Fixed Cost	35,000	-
Interest Expenses	12,000	6,000
Financial Leverage	04:01	-
Operating Leverage	-	05:01
Income Tax Rate	30%	30%
Sales	-	1,45,000

SOLUTION :

(i) Income Statement

Particulars	Co. X (Rs.)	Co. Y (Rs.)

Sales	1,23,000 (WN 2)	1,45,000
(-) Variable Cost	(72,000)	(94,250) (65% on sales)
Contribution	51,000 (WN 2)	50,750
(-) Fixed Cost	(35,000)	(40,600)
EBIT	16,000 (WN 1)	10,150 (WN 3)
(-) Interest	(12,000)	(6,000)
EBT	4,000	4,150
(-) Tax @ 30%	(1,200)	(1,245)
EAT	2,800	2,905

WN 1: Calculation of EBIT for Co. X using Financial Leverage

$$FL = \frac{EBIT}{EBT} \text{ or } \frac{EBIT}{EBIT - \text{Interest}}$$

$$4 = \frac{EBIT}{EBIT - 12,000}$$

EBIT = Rs. 16,000

EBT = Rs. 16,000 – Rs. 12,000 = Rs. 4,000

WN 2: Calculation of Contribution and Sales using reverse mechanism

$$\begin{aligned} \text{Contribution} &= \text{EBIT} + \text{Fixed Cost} \\ &= \text{Rs. 16,000} + \text{Rs. 35,000} \end{aligned}$$

Contribution = Rs. 51,000

Sales = Contribution + Variable Cost

Sales = Rs.1,23,000

WN 3: Calculation of EBIT for Co. Y using Operating leverage

OL = Contribution / EBIT

$$5 = \frac{50,750}{EBIT}$$

EBIT = Rs. 10,150

- (ii) Margin of Safety (MOS) is inversely proportionate to the Operating Leverage as higher the safety margin lower would be the business risk

$$MOS = \frac{1}{OL}$$

$$\text{Operating Leverage (Co. X)} = \frac{51,000}{16,000}$$

$$\text{Operating Leverage (Co. X)} = 3.1875 : 1$$

$$\text{Therefore, MOS for Co. X} = 1 / 3.1875$$

$$\text{MOS for Co. X} = \mathbf{31.37\%}$$

$$\text{Operating Leverage (Co. Y)} = 5 : 1$$

$$\text{Therefore, MOS for Co. X} = \frac{1}{5}$$

MOS for Co. Y = 20%

(iii) Combined leverage measures the percentage change in EPS due to percentage change in sales

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}}$$

$$\text{Combined Leverage (Co. X)} = \frac{51,000}{4,000}$$

$$= 12.75$$

$$\text{Combined Leverage} = \frac{\% \text{ change in EPS}}{\% \text{ change in sales}}$$

$$12.75 = \frac{\% \text{ change in EPS}}{25\%}$$

$$\% \text{ change in EPS (Co. X)} = 318.75\%$$

$$\text{Combined Leverage (Co. Y)} = \frac{50,750}{4,150}$$

$$= 12.23$$

$$12.23 = \frac{\% \text{ change in EPS}}{25\%}$$

$$\% \text{ change in EPS (Co. Y)} = 305.75\%$$

QUESTION 20 : PAPER – JAN 2025

Following is the Balance Sheet of EXIM Ltd. as on 31st March, 2024:

Liabilities	Rs.	Assets	Rs.
Equity Share Capital of Rs. 100 each	20,00,000	Fixed Assets	50,00,000
Retained Earnings	4,00,000	Current Assets	30,00,000
12.5% Debenture	40,00,000		
Current Liabilities	16,00,000		
	80,00,000		80,00,000

The additional information is given as under:

Fixed costs per annum (exclusive interest) : Rs. 16,00,000

Variable operating cost ratio : 70%

Total Assets turnover ratio : 2.5

Income tax rate : 30%

You are required to calculate:

(i) Earnings Per Share

(ii) Operating Leverage

(iii) Financial Leverage

(iv) Combined Leverage

SOLUTION :

Workings:

Total Assets = Rs. 80 lakhs

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = $80 \times 2.5 = \text{Rs. } 200 \text{ lakhs}$

Computation of Profit after Tax (PAT)

	(Rs.) in lakhs
Sales	200.00
Less: Variable Operating Cost @ 70%	140.00
Contribution	60.00
Less: Fixed Cost (other than Interest)	16.00
EBIT	44.00
Less: Interest on Debentures ($12.5\% \times \text{Rs. } 40 \text{ lakhs}$)	5.00
PBT	39.00
Less: Tax @ 30%	11.70
PAT	27.30

(i) Earnings per Share

$$\text{EPS} = \frac{\text{PAT}}{\text{Number of Equity Shares}} = \frac{\text{Rs. } 27.30 \text{ lakhs}}{20,000} = \text{Rs. } 136.5$$

(ii) Operating Leverage

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs. } 60 \text{ lakhs}}{\text{Rs. } 44 \text{ lakhs}} = 1.363$$

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{\text{Rs. } 44 \text{ lakhs}}{\text{Rs. } 39 \text{ lakhs}} = 1.128$$

(iv) Combined Leverage

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{PBT}}$$

OR

$$= \text{Operating Leverage} \times \text{Financial Leverage} \\ = 1.363 \times 1.128 = 1.538$$

QUESTION 21 : RTP – MAY 2025

Details of Kshitij Limited are given below for the year ended 31st March 2025 –

Particulars	Details
Sales	Rs. 180 lakhs
Fixed Cost (Excl Interest)	Rs. 45 lakhs
B.E.P Sales	Rs. 120 lakhs
Equity Share Capital of Rs. 100 Each	Rs. 150 lakhs
Income Tax Rate	25%
Cost Of Debt (Kd)	9%
Debt	Rs. 90 lakhs

Required to CALCULATE -

- Operating, Financial, Combined Leverage & P/V Ratio
- Return on Capital Employed and EPS
- Does Kshitij Limited have favorable Financial Leverage?

- (D) % Change in EPS, if EBIT increases or decreases by 15%
- (E) At what level of Sales, the PAT will be equal to 3/4th of its current value.

SOLUTION :

Particular	Amount (Rs.)
Sales	180 lakhs
Contribution (180 x 37.5%) WN - 1	67.50 lakhs
(-) Fixed Cost	(45.00) lakhs
EBIT	22.50 lakhs
(-) Interest Exp WN - 2	(10.80) lakhs
EBT	11.70 lakhs
(-) Tax @ 25%	(2.925) lakhs
EAT	8.775 lakhs
No of Equity Shares	1.50 lakhs
EPS	Rs. 5.85

(A) Calculation of OL, FL, CL & P/V Ratio**WN 1 – Calculation of P/V Ratio**

$$\text{B.E.P Sales} = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

$$\text{PV Ratio} = 45 / 120 = 37.5\%$$

WN 2 – Calculation of Interest Exp

$$K_d = \text{Interest} (1 - t)$$

$$9 = \text{Interest} (1 - 0.25)$$

$$\text{Interest} = 12\%$$

$$\text{Interest Exp} = 90 \text{ Lakhs} \times 12\% = \text{Rs. } 10.8$$

$$\text{OL} = \frac{1}{\text{Margin of Safety (MOS)}}$$

$$\text{MOS} = \frac{\text{Actual Sales} - \text{BEP Sales}}{\text{Actual Sales}}$$

$$= 60/180$$

$$= 0.3333$$

$$\text{OL} = \frac{1}{0.3333} = 3$$

OR

$$\text{OL} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$= 67.50 / 22.50$$

$$\text{OL} = 3$$

$$\text{FL} = \frac{\text{EBIT}}{\text{EBT}}$$

$$= 22.50 / 11.70$$

$$\text{FL} = 1.9231$$

$$\begin{aligned} \text{CL} &= \text{OL} \times \text{FL} \\ &= 3 \times 1.9231 \end{aligned}$$

$$\text{CL} = 5.7693$$

(B) ROCE & EPS

$$\text{EPS} = \text{Rs. 5.85 (From Income statement above)}$$

$$\begin{aligned} \text{ROCE} &= \frac{\text{EBIT}}{\text{Capital Employed}} \\ &= \frac{22.50}{240} \end{aligned}$$

$$\begin{aligned} \text{Capital Employed} &= \text{Equity} + \text{Debt} \\ &= 150 + 90 = 240 \text{ lakhs} \end{aligned}$$

(C) Since ROCE = 9.375% < Interest = 12%, Kshitij Limited doesn't have a favorable financial leverage.

(D) Financial leverage measures the relationship for % change EPS due to changes in EBIT

$$\text{FL} = \frac{\% \text{ change in EPS}}{\% \text{ change in EBIT}}$$

$$\begin{aligned} 1.9231 &= \frac{\% \text{ change in EPS}}{15} \\ &= 28.8465\% \end{aligned}$$

Therefore, EPS will increase or decrease by 28.8465%, if EBIT increases or decreases by 15%

(E) Current PAT = 8.775 lakhs

$$3/4\text{th of current PAT} = 6.58125 \text{ lakhs}$$

So, it means PAT decreases by 25%

Combined leverage measures the relationship for % change in PAT due to changes in sales

$$\text{CL} = \frac{\% \text{ change in PAT}}{\% \text{ change in Sales}}$$

$$5.7693 = \frac{25}{\% \text{ change in Sales}}$$

$$\% \text{ Change in Sales} = 4.333\%$$

$$\text{New Sales level} = 180 \text{ lakhs} - 4.33\%$$

$$\text{New Sales level} = \text{Rs.172.20 Lakhs}$$

QUESTION 22 : PAPER – MAY 2025

Following information relates to A Ltd. for the year ended 31st March, 2025:

Profit volume ratio	24%
Operating leverage	2.00
Financial leverage	1.50
Interest Expenses	Rs. 12,000
Tax rate	30%
Number of Equity Shares	1,000

You are required to:

(i) Prepare Income Statement for the year ended 31st March, 2025.

- (ii) Calculate EPS.
 (iii) Calculate percentage change in earnings per share, if sales increase by 5%.

SOLUTION :**Workings:**

- (a) Financial Leverage $= \frac{\text{EBIT}}{\text{EBT i.e. EBIT} - \text{Interest}}$
 So, 1.5 $= \frac{\text{EBIT}}{\text{EBIT} - 12,000}$
 Or, 1.5 (EBIT – 12,000) = EBIT
 Or, 0.5 EBIT = 18,000
 Or, EBIT = Rs. 36,000
- (b) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$ Or, $2 = \frac{\text{Contribution}}{\text{Rs.36,000}}$
 Or, Contribution = Rs.72,000
 Sales $= \frac{\text{Contribution}}{\text{P/V Ratio}}$
 $= \frac{\text{Rs.72,000}}{0.24} = \text{Rs.3,00,000}$
- (c) Fixed Cost = Contribution – EBIT
 = 72,000 – 36,000
 Or, Fixed cost = Rs. 36,000

(i) Income Statements for the year ended 31st March 2025

Particulars	A Ltd. (Rs.)
Sales	3,00,000
Less: Variable cost (76%)	2,28,000
Contribution	72,000
Less: Fixed Cost	36,000
Earnings before interest and tax (EBIT)	36,000
Less: Interest	12,000
Earnings before tax (EBT)	24,000
Less: Tax @ 30%	7,200
Earnings after tax (EAT)	16,800

(ii) Calculation of EPS

$$\text{EPS} = \frac{\text{Profit after tax}}{\text{No. of Equity Shares}} = \frac{16,800}{1,000} = \text{Rs.16.8}$$

(iii) Calculation of % change in EPS if Sales increase by 5%

$$\text{Degree of Combined Leverage (DCL)} = \text{Operating Leverage} \times \text{Financial Leverage} \\ = 2 \times 1.5 = 3$$

Alternatively, solution can be presented in following way:

$$\text{DCL} = \frac{\text{Contribution}}{\text{EBT}} = \frac{72,000}{24,000} = 3$$

$$\text{So, } \frac{\% \text{ change in EPS}}{\% \text{ change in Sales}} = 3$$

$$\begin{aligned} \text{Or } \% \text{ change in EPS} &= \text{DCL} \times \% \text{ change in Sales} \\ &= 3 \times 0.05 = 0.15 \text{ or } 15\% \end{aligned}$$

QUESTION 23 : RTP – SEPT 2025

X Limited and Y Limited are two mid-sized companies operating in the same competitive industry. Both companies have recently undergone a financial performance review to assess their operational efficiency, cost structure, and overall financial risk. You, as a financial analyst, have been provided with selective financial indicators and are required to draw insights and comparisons based on leverage analysis and income statement reconstruction.

The management of X Limited has disclosed that the company is currently operating with a Margin of Safety (M/S) ratio of 0.1667. In contrast, Y Limited has a Margin of Safety that is twice as high as that of X Limited.

Both companies maintain a Financial Leverage of 3. Their variable cost ratios are 60% for X Limited and 50% for Y Limited.

In terms of financing costs, X Limited incurs an annual interest expense of Rs.30,000. Y Limited, however, incurs an interest cost that is 300% higher than X Limited. Both companies are subject to a corporate tax rate of 30%, which affects their net profitability after interest and taxes.

You are required to PREPARE Income statement for both the companies and IDENTIFY the company which is better placed with reasons based on leverages.

SOLUTION :

Company X

$$\begin{aligned} \text{(i) Financial Leverage} &= \frac{\text{EBIT}}{\text{EBT i.e EBIT} - \text{Interest}} \\ \text{So, } 3 &= \frac{\text{EBIT}}{\text{EBIT} - \text{Rs.30,000}} \end{aligned}$$

$$\text{Or, } 3(\text{EBIT} - 30,000) = \text{EBIT}$$

$$\text{Or, } 2 \text{ EBIT} = 90,000$$

$$\text{Or, EBIT} = 45,000$$

$$\text{(ii) Margin of safety} = 0.1667$$

$$\text{Operating Leverage} = 1/\text{Margin of safety}$$

$$= 1/0.1667 = 6$$

$$= \frac{\text{Contribution}}{\text{EBIT}}$$

$$\text{Or, } 6 = \frac{\text{Contribution}}{\text{Rs.45,000}}$$

$$\text{Or, Contribution} = \text{Rs. } 2,70,000$$

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio}(1 - \text{variable cost ratio})}$$

$$= \frac{\text{Rs.2,70,000}}{40\%} = \text{Rs.6,75,000}$$

- (iii) Fixed Cost = Contribution – EBIT
 = Rs. 2,70,000 – 45,000
 Or, Fixed cost = Rs. 2,25,000

Company Y

- (i) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT i.e EBIT} - \text{Interest}}$
 So, 3 = $\frac{\text{EBIT}}{\text{EBIT} - \text{Rs.1,20,000}}$
 Or, 3 (EBIT – Rs. 1,20,000) = EBIT
 Or, 3 EBIT – Rs. 3,60,000 = EBIT
 Or, EBIT = Rs. 1,80,000
- (ii) Margin of safety = $0.1667 \times 2 = 0.3333$
 Operating Leverage = $1/\text{Margin of safety}$
 = $1/0.3333 = 3$
 = $\frac{\text{Contribution}}{\text{EBIT}}$
 Or, 3 = $\frac{\text{Contribution}}{\text{Rs.1,80,000}}$
 Or, Contribution = Rs. 5,40,000
 Sales = $\frac{\text{Contribution}}{\text{P/V Ratio}(1 - \text{variable cost ratio})}$
 = $\frac{\text{Rs.5,40,000}}{50\%} = \text{Rs.10,80,000}$
- (iii) Fixed Cost = Contribution – EBIT
 = Rs. 5,40,000 – Rs. 1,80,000
 Or, Fixed cost = Rs. 3,60,000
- (iv) Interest = Rs. 30,000 + Rs. 30,000 x 300% = Rs. 1,20,000

Income Statements of X Ltd and Y Ltd

	X Ltd (Rs.)	Y Ltd (Rs.)
Sales	6,75,000	10,80,000
Less: Variable cost	4,05,000	5,40,000
Contribution	2,70,000	5,40,000
Less: Fixed Cost	2,25,000	3,60,000
Earnings before interest and tax (EBIT)	45,000	1,80,000
Less: Interest	30,000	1,20,000
Earnings before tax (EBT)	15,000	60,000
Less: Tax @ 30%	4,500	18,000
Earnings after tax (EAT)	10,500	42,000

Comment based on Leverage

Comment based on leverage – Company Y is better than company X of the following reasons:

- (i) Capacity of Company Y to meet interest liability is same that of companies X (from EBIT/Interest ratio)

$$[X = \frac{\text{Rs.45,000}}{\text{Rs.30,000}} = 1.5, Y = \frac{\text{Rs.1,80,000}}{\text{Rs.1,20,000}} = 1.5]$$
- (ii) However, Company Y has lesser financial risk as the total risk (business and financial) of company Y is lower (combined leverage of Company X is 18 and Company Y is 9).

QUESTION 24 : PAPER – SEPT 2025

M/s KRY Limited is a mid-sized company engaged in manufacturing and sales of Industrial equipment. The capital structure of the company is as under:

Equity Share Capital (12,500 Shares of Rs.100 each)	Rs.12,50,000
6% Debentures	Rs. 50,00,000
8% Bank of Loan	XXXXXX
Other information are as under:	
Total Sales	Rs. 75,00,000
P/V Ratio	40%
Operating Leverage	2.4
Corporate Tax Rate	3.84
Corporate Tax Rate	30%
P/E Ratio	8

You are required to calculate following:

- (i) Earnings Before Interest and Tax
 (ii) Fixed Cost excluding interest
 (iii) Amount of Bank Loan and Bank Interest (iv) Earning Per Share
 (v) Market Price Per Share

SOLUTION :

- (i) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$

$$2.4 = \frac{75,00,000 \times 0.40}{\text{EBIT}}$$

$$\text{EBIT} = 12,50,000$$
- (ii) Fixed Cost excluding interest = Contribution – EBIT

$$= 30,00,000 - 12,50,000 = 17,50,000$$
- (iii) Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}}$

$$3.84 = \frac{30,00,000}{\text{EBT}}$$

$$\text{EBT} = 7,81,250$$

$$\text{Total Interest} = \text{EBIT} - \text{EBT} = 4,68,750$$

$$\text{Interest on bank loan} = \text{Total Interest} - \text{Interest on debentures}$$

$$\begin{aligned}
 &= 4,68,750 - 3,00,000 = 1,68,750 \\
 \text{Amount of bank loan} &= 1,68,750 / 8\% \\
 &= 21,09,375
 \end{aligned}$$

(iv)

Particulars	(Rs.)
EBT (Earnings before tax)	7,81,250
Less: Tax @ 30%	2,34,375
PAT (Profit after tax)	5,46,875
No. of shares	12,500
Earnings per share (EPS)	43.75

(v)

$$\begin{aligned}
 \text{Market price per share} &= \text{EPS} \times \text{PE Ratio} \\
 &= 43.75 \times 8 = 350
 \end{aligned}$$

QUESTION 25 : RTP – JAN 2026

Following Balance Sheet and Income Statement have been obtained from the books of accounts of Pinaca Pvt. Ltd.

Balance Sheet as on March 31st 2025

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Equity Capital (Rs. 10 per share)	80,00,000	Net Fixed Assets	1,00,00,000
10% Debt	60,00,000	Current Assets	90,00,000
Retained Earnings	35,00,000		
Current Liabilities	15,00,000		
	1,90,00,000		1,90,00,000

Income Statement for the year ending March 31st 2025

Particulars	Amount (Rs.)
Sales	34,00,000
Less: Operating expenses (including Rs. 6,00,000 depreciation)	(12,00,000)
EBIT	22,00,000
Less: Interest	(6,00,000)
Earnings before tax	16,00,000

The tax rate applicable to the company is 35 percent.

- DETERMINE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.
- If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, COMPUTE the earnings per share at the new sales level?

SOLUTION :

- Degree of operating, financial and combined leverages at the current sales level-**

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$= \frac{\text{Rs.34,00,000} - \text{Rs.6,00,000}}{\text{Rs.22,00,000}} = 1.27$$

$$\begin{aligned} \text{DFL} &= \frac{\text{EBIT}}{\text{EBT}} \\ &= \frac{\text{Rs.22,00,000}}{\text{Rs.16,00,000}} = 1.375 \end{aligned}$$

$$\text{DCL} = \text{DOL} \times \text{DFL} = 1.27 \times 1.38 = 1.75$$

(ii) **Earnings per share at the new sales level** (Amount in Rs.)

Particulars	Increase by 20%	Decrease by 20%
Sales level	40,80,000	27,20,000
Less: Variable expenses	7,20,000	4,80,000
Less: Fixed cost	6,00,000	6,00,000
Earnings before interest and taxes	27,60,000	16,40,000
Less: Interest	6,00,000	6,00,000
Earnings before taxes	21,60,000	10,40,000
Less: Taxes @35%	7,56,000	3,64,000
Earnings after taxes (EAT)	14,04,000	6,76,000
Number of equity shares	8,00,000	8,00,000
EPS	1.76	0.85

Working Notes:

Variable Costs = Rs. 6,00,000 (total cost - depreciation)

Variable Costs at:

- (i) Sales level, Rs. 40,80,000 = Rs. 7,20,000 (increase by 20%)
- (ii) Sales level, Rs. 27,20,000 = Rs. 4,80,000 (decrease by 20%)

QUESTION 26 : PAPER – JAN 2026

RK Limited provided following data for the year ended on 31-03-2025:

Sales	Rs. 50,00,000
EPS	Rs. 2.50
Tax Rate	Rs. 40%
Fixed cost excluding interest	Rs. 10,80,000
The Capital structure is as under:	
Equity Share capital of Rs. 10/- each	Rs. 18,00,000
10% Preference share of Rs. 100/- each	Rs. 9,00,000
12% Debentures	Rs. 75,00,000

You are required to:

- (i) Calculate Earnings before Interest and Tax (EBIT).
- (ii) Calculate Combined Leverage.
- (iii) Advise, the level of sales where Earning before Tax (EBT) will be zero.

SOLUTION :

(i) Calculation of Earnings before Interest and Tax (EBIT)

Particulars	Amount (Rs.)
Sales Revenue	50,00,000
Less: Variable Cost (Balancing figure)	21,20,000
Contribution	28,80,000
Less: Fixed Cost (excluding interest)	10,80,000
Earnings Before Interest & Tax (EBIT)	18,00,000
Less: Interest on Debentures (12% of Rs. 75,00,000)	9,00,000
Earnings Before Tax (EBT)	9,00,000
Less: Tax @ 40%	3,60,000
Profit After Tax (PAT)	5,40,000
Less: Preference Dividend (10% of Rs. 9,00,000)	90,000
Profit available to Equity Shareholders (1,80,000 × 2.50)	4,50,000

(ii) Combined Leverage = $\frac{\text{Contribution}}{\text{EBT} - \text{Pref.Dividend(Pre - tax)}}$
 $= \frac{\text{Rs.28,80,000}}{\text{Rs.9,00,000} - 1,50,000} = 3.84$

- (iii) EBT zero means 100% reduction in EBT. Since combined leverage is 3.84, sales have to be dropped by $100/3.84 = 26.042\%$. Hence new sales will be Rs. $50,00,000 \times (100 - 26.042) =$ Rs. 36,97,900.

Therefore, at Rs. 36,97,900. level of sales, the Earnings before Tax of the company will be equal to zero.

Combined Leverage and Sales can also be calculated without deducting preference dividend in following way:

(ii) Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs.28,80,000}}{\text{Rs.9,00,000}} = 3.2$

- (iii) EBT zero means 100% reduction in EBT. Since combined leverage is 3.2, sales have to be dropped by $100/3.2 = 31.25\%$. Hence new sales will be Rs. $50,00,000 \times (100 - 31.25) =$ Rs. 34,37,500.

Therefore, at Rs. 34,37,500. level of sales, the Earnings before Tax of the company will be equal to zero.

QUESTION 27 : RTP – MAY 2026

ABC Manufacturing Limited produces industrial components with a well-established market presence. The company operates under a special tax-free status granted by the government, which exempts it from corporate income tax obligations.

Financial Information

The company's financial parameters for the current fiscal year are as follows:

Capital Structure Details

- Total Capital Invested: Rs. 20,00,000 (Rs. 20 lakhs)
- Cost of Equity (Ke): 12% per annum

- Cost of Debt (Kd): 6% per annum
- Weighted Average Cost of Capital (WACC): 9% per annum

Operational Information

- Annual Sales Revenue: Rs. 24,00,000 (Rs. 24 lakhs)
- Variable Costs: 50% of sales revenue
- Fixed Costs: Rs. 10,00,000 (Rs. 10 lakhs) per annum

General corporate tax is 25%

As a financial analyst, you have been tasked with conducting a comprehensive financial analysis of ABC Manufacturing Limited. Specifically, you are required to:

- DETERMINE the optimal debt-equity composition that results in the given weighted average cost of capital of 9%.
- PREPARE a comprehensive Income Statement showing the company's profitability from operations through net income when the cost of debt is 6%, 10% & 12%.
- CALCULATE the Return on Investment (ROI) to assess how efficiently the company is utilizing its total capital invested.
- CALCULATE the Return on Equity (ROE) to evaluate the returns generated for equity shareholders.
- FIND the different leverages in the following format

	Computation	Dependent on	Indicates effect of ____ on
Leverages showing level of business risk			
Leverages showing level of finance risk			
Leverages showing level of combined risk			

- EXPLAIN the concept of Leverage as a double edged sword by explaining the Leverage Effect when $ROI > K_d$, $ROI = K_d$, $ROI < K_d$.
- DERIVE ROE from ROI in the following format –

Cost of debt =	6%	10%	12%
Return on Investment % of Equity			
Surplus / Deficit from debt payments in %			
Surplus / Deficit from debt payments in INR			
Return on Equity in INR = ROI + Surplus – Deficit			
Return on Equity in % = Return on Equity in INR/Equity			

SOLUTION :

Optimal debt-equity composition

Let the weight of equity be W

Item	Cost	Weight	Product

Equity	12	W	12W
Debt	6	1 – W	6 – 6W
		1	9%

$$9 = 12W + 6 - 6W$$

$$3 = 6W$$

$$W = 0.5.$$

So, Weight of Equity is 0.50

So, Weight of Debt is $1 - 0.50 = 0.50$

Total Capital = 20 Lakhs. Hence, Debt and equity 10 Lakhs each.

Income Statement

Cost of debt =	6%	10%	12%
Sales	24,00,000	24,00,000	24,00,000
Less: Variable Costs (50%)	12,00,000	12,00,000	12,00,000
Contribution	12,00,000	12,00,000	12,00,000
Less: Fixed Costs (Given)	10,00,000	10,00,000	10,00,000
EBIT	2,00,000	2,00,000	2,00,000
Less: Interest	60,000	1,00,000	1,20,000
EBT / PAT	1,40,000	1,00,000	80,000
Return on Investment = EBIT/Capital employed	10%	10%	10%
Return on equity = PAT / Equity Capital	14%	10%	8%

Leverages showing level of different risk

Leverages showing level of	Leverages	Computation	Dependent on	Indicates effect of ... on ...
Business Risk	Operating Leverage (DOL)	$\text{Contribution} \div \text{EBIT}$ $= 12,00,000 \div 2,00,000$ $= 6$	Fixed Operating Costs	Sales on EBIT
Financial Risk	Financial Leverage (DFL)	$\text{EBIT} \div \text{EBT}$ $= 2,00,000 \div 1,40,000$ $= 1.43$	Fixed Financial Costs	EBIT on EPS
Combined Risk	Combined Leverage (DCL)	$\text{Contribution} \div \text{EBT}$ or $\text{DOL} \times \text{DFL} = 6 \times 1.43 = 8.58$	Both Fixed Operating Fixed Financial Costs	Sales on EPS

$$\begin{aligned} \text{Return on Investment} &= \text{EBIT} / \text{Capital employed} \\ &= 2,00,000 / 20,00,000 = 10\% \end{aligned}$$

When the cost of 'fixed cost fund' is less than the return on investment, financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress. Therefore, financial leverage is also known as **"double edged sword"**.

Effect on EPS and ROE:

When, ROI (10%) > Interest (6%) – Favourable – Advantage

When, ROI (10%) < Interest (12%) – Unfavourable – Disadvantage

When, ROI (10%) = Interest (10%) – Neutral – Neither advantage nor disadvantage

Income Statement

Cost of debt =	6%	10%	12%
Return on Investment = 10% of Equity	1,00,000	1,00,000	1,00,000
Surplus / Deficit from debt payments in %	10 – 6 = 4%	10 – 10 = 0	10 – 12 = –2%
Surplus / Deficit from debt payments in INR = % of Debt	40,000	Nil	(20,000)
Return on Equity in INR = ROI + Surplus – Deficit	1,40,000	1,00,000	80,000
Return on Equity in % = Return on Equity in INR / Equity	14%	10%	8%

QUESTION 28 : PAPER – MAY 2026

Finance manager of A Ltd. noticed that a 5% increase in sales leads to increase of Rs. 9,000 in operating profit. The company operates with a contribution margin of 40%, fixed annual operating cost of Rs.1,35,000 and interest obligation of Rs. 30,000.

You are required to calculate:

- Current level of sales of the company.
- Operating, financial and combined leverage.

SOLUTION :

(i) Current level of Sales:

Let the present sales be = Rs.X

or 5% of Sales $\times$ 40% = 9,000

or $0.05X \times 0.40$ = 9,000

or $0.02X$ = 9,000

Current Sales (X) = Rs. 4,50,000

P/V ratio = Change in profit/ Change in sales

0.40 = 9,000/X

X = 9,000/0.40

= Rs 22,500

Hence, total sales;

= Change in sales/ % change in sales

= Rs. 22,500/0.05

= Rs. 4,50,000

Income Statement

Particulars	(Rs.)
Sales	4,50,000
Contribution (40%)	1,80,000

Less: Fixed annual operating cost	(1,35,000)
EBIT (Earnings before interest and tax)	45,000
Less: Interest	(30,000)
EBT (Earnings before tax)	15,000

(ii) Leverage

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs.1,80,000}}{\text{Rs.45,000}} = 4$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Rs.45,000}}{\text{Rs.15,000}} = 3$$

$$\text{Combined Leverage} = \text{Operating Leverage} \times \text{Financial Leverage} \\ = 4 \times 3 = 12$$

Or,

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs.1,80,000}}{\text{Rs.15,000}} = 12$$

QUESTION 29 : RTP – SEPT 2026

Anirban Ltd. is a well-established manufacturing company engaged in producing industrial components for various engineering industries. The management intends to assess the company's financial performance and capital structure efficiency using key financial ratios and leverage measures. The following information has been extracted from the company's latest financial statements.

Capital Structure of Anirban Ltd.

Source of Finance	Amount (Rs.)
Equity Share Capital (Rs.10 per share)	8,00,000
10% Preference Share Capital (Rs.100 per share)	5,00,000
12% Debentures (Rs.100 each)	7,00,000
Total Capital Employed	20,00,000

Additional Information:

- The company reported a Profit After Tax (PAT) of Rs. 2,80,000 during the year.
- The applicable corporate tax rate is 30%.
- Total operating expenses, including depreciation of Rs. 96,800, are equal to 1.5 times the Earnings Before Interest and Tax (EBIT).
- Equity shareholders were paid a dividend at the rate of 15%.
- The market price per equity share is Rs. 23.

Required:

Based on the information provided above, calculate the following:

- Operating Leverage and Financial Leverage.
- Preference Dividend Cover and Equity Dividend Cover.
- Earnings Yield Ratio.
- Price–Earnings (P/E) Ratio.

Show all necessary workings and assumptions clearly.

SOLUTION :

Working Notes:

	(Rs.)
Net Profit after Tax	2,80,000
Tax @ 30%	1,20,000
EBT	4,00,000
Interest on Debentures	84,000
EBIT	4,84,000
Total Operating Expenses (1.5 times of EBIT)	7,26,000
Sales	12,10,000

(i) Operating Leverage

Variable operating expenses = Rs. 7,26,000 - 96,800 = Rs. 6,29,200

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs.}(12,10,000 - 6,29,000)}{\text{Rs.}4,84,000} = \frac{\text{Rs.}5,80,000}{\text{Rs.}4,84,000} = 1.2 \text{ times}$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{4,84,000}{4,00,000} = 1.21 \text{ times}$$

(ii) Cover for Preference Dividend

$$= \frac{\text{PAT}}{\text{Preference Share Dividend}} = \frac{\text{Rs.}2,80,000}{\text{Rs.}50,000} = 5.6 \text{ times}$$

Cover for Equity Dividend

$$= \frac{(\text{PAT} - \text{Preference Dividend})}{\text{Equity Share Dividend}} = \frac{\text{Rs.}(2,80,000 - 50,000)}{\text{Rs.}1,20,000}$$

$$= \frac{\text{Rs.}2,30,000}{\text{Rs.}1,20,000} = 1.92 \text{ times}$$

(iii) Earning Yield Ratio

$$= \frac{\text{EPS}}{\text{Market Price}} \times 100$$

$$= \left(\frac{\frac{2,30,000}{80,000} \times 100}{23} \right)$$

$$= \frac{2.875}{23} \times 100 = 12.5\%$$

(iv) Price – Earnings Ratio (PE Ratio)

$$= \frac{\text{Market Price}}{\text{EPS}} = \frac{23}{2.875} = 8 \text{ times}$$

Note: All operating expenses, other than depreciation, are variable costs.

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:

$$K_e = \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g$$

$$= \frac{\text{Rs } 3.60(1.09)}{\text{Rs } 54} = 0.09 = 0.0727 + 0.09 = 16.27\%$$

(b) Preference Shares:

$$K_p = \frac{\text{Preference Share Dividend}}{F_o}$$

$$= \frac{\text{Rs } 11}{\text{Rs } 95} = 11.58\%$$

- (c) Debt at 12%
 $kd(1-t) = 12\%(1-0.4) = 12\% \times 0.6 = 7.20\%$

- (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:

- COMPUTE weighted average cost of capital (WACC) of the company based on the existing capital structure.
- 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 :

- 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 (W.N.2)	10,00,000	0.125	11.50	1.437
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.)

- Cost of equity capital:

$$K_e = \frac{\text{Expected Dividend (D}_1\text{)}}{\text{Current market price per Share (P}_0\text{)}} + \text{Growth (g)}$$

$$= \frac{\text{Rs } 2}{\text{Rs } 20} + 0.05 = 0.15 \text{ or } 15\%$$

- Cost of preference share capital:
$$= \frac{\text{Annual preference share dividend (PD)}}{\text{Net proceeds in the issue of preference share (NP)}}$$

$$= \frac{\text{Rs } 1,15,000}{\text{Rs } 1,00,000}$$

- Cost of 10% Debentures:
$$= \frac{1(1-t)\text{Rs } 3,00,000(1-0.35)}{\text{NP}-\text{Rs } 3,00,000} = 0.065 \text{ or } 6.5\%$$

- 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:

$$K_e = \frac{\text{Expected Dividend (D1)}}{\text{Current Market Price per share (P0)}} + \text{Growth (g)}$$

$$\frac{\text{Rs } 2.40}{\text{Rs } 16} + 5\% = 20\%$$

5. Cost of 12% Debentures :

$$K_d = \frac{2,40,000(1-0.35)}{\text{Rs } 20,00,000} = 0.078 \text{ or } 7.8\%$$

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:

- Rs 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, Rs100
- Rs100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, Rs100.
- 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:

$$(i) \quad \text{Cost Debt (Kd)} = \frac{\text{Interest}(1-t) + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{\text{Rs } .11(120.35) + \frac{(\text{Rs}100-\text{Rs}96)}{10 \text{ Years}}}{\frac{(\text{Rs}100+\text{Rs}96)}{2}}$$

$$(ii) \quad \text{Cost of Preference Shares (Kp)} = \frac{\text{PD} + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{\text{Rs } 12 + \frac{(\text{Rs}100-\text{Rs}95)}{10 \text{ Years}}}{\frac{(\text{Rs } 100+\text{Rs}95)}{2}}$$

$$= \frac{Rs\ 12 + Rs\ 0.5}{Rs\ 97.5} = 0.1282 \text{ or } 12.82\%$$

$$(iii) \text{ Cost of Equity Shares (Ke)} = \frac{D_1}{P_0} + G = \frac{Rs\ 2}{Rs\ 22 - Rs\ 2} + 0.07 = 0.17 \text{ or } 17\%$$

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 ($\frac{Rs\ 8,00,000}{Rs\ 100} \times Rs\ 110$)	8,80,000	0.265	7.70	2.04
Preferences shares ($\frac{Rs\ 2,00,000}{Rs\ 100} \times Rs\ 120$)	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)**

$$K_e = \frac{D_0(1+g)}{P_0} + g = \frac{25\% \text{ of Rs. } 4 (1+0.10)}{\text{Rs. } 50} + 0.10 = 0.122 \text{ or } 12.2\%$$

(ii) **Cost of Debt (K_d)**

$$K_d = \frac{\text{Interest}}{\text{Net Proceeds}} \times 100 \times (1-t)$$

Interest on First Rs. 2,00,000 @10% = Rs. 20,000

Interest on next Rs. 2,00,000 @15% = Rs. 30,000

$$K_d = \frac{50,000}{4,00,000} \times (1-0.3) = 0.0875 \text{ or } 8.75\%$$

(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	4,00,000	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

$$K_e = \frac{D}{P_0} + g = \frac{25\% \text{ of Rs. } 4}{\text{Rs. } 50} + 0.10 = \frac{\text{Rs. } 1.00}{\text{Rs. } 50} + 0.10 = 0.120 \text{ or } 12.00\%$$

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	4,00,000	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:
- Cost of new debt
 - Cost of new preference shares
 - 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 year's 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

$$K_d = \frac{1(1-t)}{P_0} = \frac{16(1-0.5)}{96} = 0.0833$$

- (ii) Cost of new preference shares

$$K_p = \frac{PD}{P_0} = \frac{1.1}{9.2} = 0.12$$

- (iii) Cost of new equity shares

$$K_e = \frac{D_1}{P_0} + g = \frac{11.80}{236} + 0.10 = 0.05 + 0.10 = 0.15$$

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 = $(0.50) (236 \times 10,000) = \text{Rs. } 11,80,000$

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

$$\frac{\text{Rs } 11,80,000}{0.80} = \text{Rs } 14,75,000$$

- (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 $\frac{\text{Rs } 11.80}{200} + 0.10 = 0.159$

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 :

- The amount will be raised by equity and debt in the ratio of 3:1
- The additional issue of equity shares will result in price per share being fixed at Rs. 25
- 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
- The net expected dividend on equity shares is Rs. 2.00 per share. The dividend is expected to grow at the rate of 5%
- Income tax rate is 25%

You are required:

- To determine the amount of equity and debt for raising additional finance.
- To determine the post-tax average cost of additional debt
- To determine the cost of retained earnings and cost of equity
- 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 $3/4^{\text{th}}$ of Rs. 5 Crore = Rs. 3.75 Crore

Debt $1/4^{\text{th}}$ 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

$$= \frac{(\text{Rs. } 75,00,000 \times 0.075) + (\text{Rs. } 50,00,000 \times 0.09)}{1,25,00,000} \times 100$$

$$= \frac{\text{Rs. } 5,62,500 + \text{Rs. } 4,50,000}{1,25,00,000} \times 100 = 8.10\%$$

(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

$$\text{Then, } K_e = \frac{\text{Rs. } 2(1.05)}{\text{Rs. } 25} + 0.05 = \frac{\text{Rs. } 2.1}{\text{Rs. } 25} + 0.05 = 0.084 + 0.05 = 0.134 = 13.4\%$$

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)**

$$\frac{D}{P_0 - F} + g = \frac{Rs\ 5}{Rs\ 265 - Rs\ 1} + 0.15 = 0.1689 \text{ or } 16.89\%$$

(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

$$\text{IRR} = 2\% + \frac{9.32}{9.32 - (-17.59)} (5\% - 2\%) = 2\% + \frac{9.32}{26.91} = 3.04\%$$

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 (Rs.120 × 10,000)	12,00,000	0.022	0.0304	0.00067
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:

- Rs. 100 per debenture redeemable at par has 2% floatation cost & 10 years of maturity. The market price per debenture is Rs. 110.
- 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
- 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 :

$$1. \quad \text{Cost of Equity } (K_e) = \frac{D_1}{P_0 - F} + g = \frac{\text{Rs. } 2}{\text{Rs. } 25 - \text{Rs. } 4} + 0.05 = 0.145 \text{ (approx.)}$$

$$2. \quad \text{Cost of Debt } (K_d) = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$= \frac{10(1-0.3) + \frac{(100 - 98)}{10}}{\frac{(100 + 98)}{2}} = \frac{7 + 0.2}{99} = 0.073 \text{ (approx.)}$$

$$3. \quad \text{Cost of Preference Shares } (K_p) = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$= \frac{12 + \frac{(100 - 97)}{10}}{\frac{(100 + 97)}{2}} = \frac{12 + 0.3}{98.5} = 0.125 \text{ (approx.)}$$

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	10%
5,00,001 – 10,00,000	9%
Above 10,00,000	8%

Assuming that there is no Reserve and Surplus available in TT Ltd.

You are required to :

- Find the pattern of finance for additional requirement
- Calculate post tax average cost of additional debt
- Calculate cost of equity
- 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

$$= \frac{\text{Rs. 5,00,000} \times 0.07 + (\text{Rs. 5,00,000} \times 0.063) + (\text{Rs. 10,00,000} \times 0.056)}{\text{Rs. 20,00,000}} \times 100 = 6.125\%$$

(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

$$K_e = \frac{\text{Rs. } 6(1 + 0.06)}{\text{Rs. } 120} + 0.06 = \frac{\text{Rs. } 6.36}{\text{Rs. } 120} + 0.06 = 0.113 \text{ or } 11.3\%$$

(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 ₹ 25 per share currently. The company pays a dividend of ₹ 5 per share and the investor's market expects a growth rate of 5% per year. You are required to:

- CALCULATE the company's cost of equity capital.
- 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 :

- Cost of Equity Capital (K_e)

$$\frac{\text{Expected dividend per share (D}_1\text{)}}{\text{Market price per share (P}_0\text{)}} + \text{Growth rate (g)}$$

$$\frac{\text{Rs } 5 \times 1.05}{\text{Rs } 25} + 0.05 = 26\%$$

- Cost of Debenture (K_d):
 Using Present Value method (or YTM)
 Identification of relevant cash flows

Year	Cash flows
0	Current market price (P ₀) = 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=

$$\begin{aligned}
 \text{IRR} &= L + \frac{NPV_L}{NPV_L - NPV_H} (H - L) \\
 &= 9\% + \frac{6.22}{6.222(20.21)} (10\% - 9\%) = 9\% + \frac{6.22}{6.43} \\
 &= \text{Therefore, } K_d = 9.97\%
 \end{aligned}$$

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:

$$K_e = \frac{\text{Earnings}}{\text{Market Price per share}} = \frac{24\% \times \text{Rs. } 100}{\text{Rs. } 180} = 13.333\%$$

(2) Cost of Debentures : $(K_d) = \frac{I(1 - t)}{NP} = \frac{\text{Rs. } 12(1 - 0.3)}{\text{Rs. } 110} = 7.636\%$

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 Rs.16.105 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 :

$$(i) \quad \text{Cost of Equity (Ke)} = \frac{D1}{P_0 - F} + g = \frac{Rs.17.716}{Rs.125 - Rs.5} + 0.10$$

$$Ke = 0.2476$$

Calculation of g :

$$Rs.10(1 + g)^5 = Rs.16.105$$

$$\text{Or, } (1 + g)^5 = \frac{16.105}{10} = 1.6105$$

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.

$$(ii) \quad \text{Cost of Retained Earnings (Kr)} = \frac{D1}{P_0} + g = \frac{Rs.17.716}{Rs.130} + 0.10 = 0.2363$$

$$(iii) \quad \text{Cost of Preference Shares (Kp)} = \frac{PD}{P_0} = \frac{Rs.15}{Rs.105} = 0.1429$$

$$(iv) \quad \text{Cost of Debentures (Kd)} = \frac{1(1-t) + \left(\frac{RV - NP}{n}\right)}{\frac{RV + NP}{2}} = \frac{Rs.15 \times 0.70 + Rs.0.75}{95.875} = \frac{11.25}{95.875} = 0.1173$$

*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)

$$= Rs.15 \div 0.16 = Rs.93.75$$

Market value (P0) of debentures can also be found out using the present value method:

$$P_0 = \text{Annual Interest} \times PVIFA (16\%, 11 \text{ years}) + \text{Redemption value} \times PVIF (16\%, 11 \text{ years})$$

$$P_0 = Rs. 15 \times 5.0287 + Rs.100 \times 0.1954 \quad P_0 = Rs.75.4305 + Rs.19.54 = Rs. 94.9705$$

Net Proceeds = Rs 94.9705 3 2% of Rs.100 = Rs.92.9705 Accordingly, the cost of debt can be calculated

$$\text{Sale proceeds from debentures} = Rs.93.75 - Rs. 2 \text{ (i.e., floatation cost)} = Rs.91.75$$

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):

$$\text{Using Book Value} = \frac{Rs. 86.0022}{Rs. 390} = 0.2205\%$$

Using Market Value = $\frac{Rs.110.2216}{Rs\ 488.30} = 0.2257 \text{ or } 22.57\%$

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%

- Calculate the cost of convertible debentures using the approximation method
- Use YTM method to calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.03,t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.05,t}$	0.952	0.907	0.864	0.823	0.746	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.03,t}$	0.971	1.913	2.829	3.717	5.417	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.05,t}$	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

$$12.76 = 10 (1 + g)^5$$

$$1.276 = (1 + g)^5$$

$$(1 + 5\%)^5 = 1.276 \text{ from FV Table}$$

$$g = 5\%$$

$$\text{Price of share after 6 years} = \frac{D_7}{k_e - g} = \frac{12.76(1.05)^7}{0.325 - 0.05}$$

$$P_6 = \frac{12.76 \times 1.407}{0.275}$$

$$P_6 = 65.28$$

$$\text{Redemption Value of Debenture (RV)} = 65.28 \times 2 = \mathbf{130.56 \text{ (RV)}}$$

$$\text{NP} = 95$$

$$n = 6$$

$$K_d = \frac{\frac{INT (1-t) + \frac{(RV - NP)}{n}}{2}}{\frac{(RV - NP)}{2}} \times 100$$

$$= \frac{15 (1-0.4) + \frac{(130.56 - 95)}{6}}{\frac{(130.56 + 95)}{2}} \times 100$$

$$= \frac{9 + 5.93}{112.78} \times 100$$

$$K_d = 13.24\%$$

(ii) Calculation of Cost of Preference Shares:

$$\begin{aligned} \text{Net Proceeds} &= 100 (1.1) - 6\% \text{ of } 100 (1.1) \\ &= 110 - 6.60 \\ &= \mathbf{103.40} \end{aligned}$$

$$\text{Redemption Value} = 100$$

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 $(8/100) \times 25$ = Rs. 2 $\therefore$ Market Price of Preference shares = Rs. 16

$$K_p = \frac{2}{16} = 0.125 \text{ (or) } 12.5\%$$

$$\text{No. of Preference shares} = \left(\frac{4,00,000}{25} \right) = 16,000$$

W.N. 2

$$\text{Market price of Debentures} = \left(\frac{120}{100} \right) \times 100 = \text{Rs. } 120$$

$$K_d = \left[\frac{12 (1 - 0.3)}{120} \right] = 0.07 \text{ or } 7\%$$

$$\text{No. of Debentures} = \left(\frac{6,00,000}{100} \right) = 6,000$$

W.N.3

Market Price of Equity shares = Rs.39

 K_e (given) = 19% or 0.19

$$\text{No. of Equity shares} = \frac{5,00,000}{10} = 50,000$$

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	<u>Rs. 1,50,000</u>
	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 and
 - 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:**

$$K_d = I \frac{(1 - t)}{P_1} = 15 \frac{(1 - 0.3)}{96}$$

$$= 0.1094 \text{ (or) } 10.94\%$$

- (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:**

$$K_e = \left(\frac{D_1}{P_0} \right) + g = \left(\frac{(2.50 \times 50\%)}{25} \right) + 0.10$$

$$= 0.15 \text{ or } 15\%$$

- (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%.

- CALCULATE the Weighted Average Cost of Capital (WACC) using market value proportions.
- 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 :

- Calculation of Cost of Equity

$$\begin{aligned}
 (i) \quad D_0 &= \text{Rs } 5 \times 60\% \\
 D_0 &= \text{Rs } 3 \\
 g &= b \times r \\
 &= (1-0.6) \times 10\% = 4\% \\
 D_1 &= D_0 \times (1 + g) \\
 &= 3 \times (1 + 4\%) \\
 &= 3 \times 1.04 = 3.12 \\
 K_e &= \frac{D_1}{P_0} + g \\
 K_e &= \frac{3.12}{20.8} + 0.04 \\
 K_e &= 19\%
 \end{aligned}$$

(ii) Calculation of Cost of Preference Shares N = 10 years

NP = Rs 90 PD = Rs 15 RV = Rs 100

$$K_p = \frac{PD + (RV - NP)/N}{(RV + NP)/2} \times 100$$

$$K_p = \frac{15 + (100 - 90)/10}{(100 + 90)/2} \times 100$$

$$K_p = 16/95 \times 100$$

$$K_p = 16.84\%$$

(iii) Calculation of Cost of Debentures N = 6 years

NP = Rs 75 Interest = Rs 14 RV = Rs 100 T = 40%

$$K_d = \frac{int(1-t) + (RV - NP)/N}{(RV + NP)/2} \times 100$$

$$K_d = \frac{14(1 - 0.4) + (100 - 75)/6}{(100 + 75)/2} \times 100$$

$$K_d = \frac{8.424.17}{87.5} \times 100$$

$$K_d = 14.37\%$$

(iv) Cost of Term Loan

Kd = Interest rate (1-t)

$$K_d = 13\% (1 - 40\%) K_d = 7.8\%$$

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 = Rs 10,000,000

Retained Earnings = 20% of Rs 50,000,000 = Rs 10,000,000

$$\text{Marginal Cost of Equity} = \frac{3.12}{1.4} + 0.04 = 26.28\%$$

Marginal Cost of Debt

$$\text{Cost of Debt (before tax)} = \frac{13\% \text{ of Rs } 40,00,000 + 15\% \text{ of Rs } 60,00,000}{\text{Rs } 1,00,00,000}$$

$$= \frac{\text{Rs } 5,20,000 + \text{Rs } 9,00,000}{\text{Rs } 1,00,00,000} = 14.2\%$$

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:

- Dividend payout ratio
- Market price of share at optimum dividend payout ratio
- P/E ratio, at which the dividend policy will have no effect on the price of share
- Market price of share at this P/E ratio
- 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:

$$P = \frac{D + \frac{r}{K_e} (E-D)}{K_e} \quad \text{or} \quad P = \frac{D + \frac{12\%}{8\%} (10 - D)}{8\%}$$

$$\text{or } [D + 1.5(10 - D)] / 0.08 = 130$$

$$\text{or } D + 15 - 1.5D = 10.4$$

$$\text{or } -0.5D = -4.6 \text{ So,}$$

$$D = \text{Rs. } 9.2$$

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:

$$P = \frac{0 + \frac{12\%}{8\%}(10 - 0)}{8\%}$$

$$P = \text{Rs. } 187.5$$

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:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{9.2 + \frac{0.12}{0.12}(10 - 9.2)}{0.12} = \text{Rs. } 83.33$$

(v) Dividend Growth Model applying growth on dividend

$$K_e = 8\%, r = 12\%, D_0 = 9.2, b = 0.08$$

$$g = b \cdot r$$

$$g = 0.08 \times 0.12 = 0.96\%$$

$$D_1 = D_0(1 + g) = 9.2(1 + 0.0096) = \text{Rs. } 9.2883$$

$$P = \frac{D_1}{(K_e - g)} = 9.2883 / (0.08 - 0.0096) = 9.2883 / 0.0704 = \text{Rs. } 131.936$$

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:

- Determine the existing Weighted Average Cost of Capital (WACC) taking book value weights
- 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

$$14.07 = 10 \times FVIF(i, 7 \text{ years})$$

$$FVIF(i, 7 \text{ years}) = 1.407$$

$$FVIF(5\%, 7 \text{ years}) = 1.407$$

$$i = 5\%$$

$$\text{Growth rate in dividend} = 5\%$$

(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

$$WACC = (\text{Product} / \text{Total book value}) \times 100 = (9,20,200 / 50,00,000) \times 100 = \mathbf{18.4\%}$$

(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 (1)	Book value (Rs) (2)	Weights (3)	Cost of capital (%) (4)	Product (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:

- Cost of debt
- Cost of retained earnings and cost of equity
- 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

$$\text{So, } K_e \text{ or } K_r = \frac{30 (1 + 0.15)}{500} + 0.15 = 0.069 + 0.15 = 21.9\%$$

Computation of overall weighted average after tax 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

$$\text{WACC} = (\text{Product} / \text{Total book value}) \times 100 = (4,20,000 / 25,00,000) \times 100 = 16.8\%$$

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

$$\text{So, } K_e \text{ or } K_r = \frac{30 (1 + 0.05)}{500} + 0.05 = 0.063 + 0.05 = 11.3\%$$

ii. Computation of overall weighted average after tax 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

$$\text{WACC} = (\text{Product} / \text{Total book value}) \times 100 = (2,61,000 / 25,00,000) \times 100 = 10.44\%$$

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%.

- 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.
- CALCULATE the marginal cost of capital for the new funds raised.
- 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.)
- 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:**

$$\begin{aligned} \text{(a) New 14\% Debenture } (K_d) &= \frac{I(1-t)}{NP} = \frac{\text{Rs. } 14 (1-0.5)}{\text{Rs. } 99} \\ &= 0.0707 \text{ or } 7.07\% \end{aligned}$$

$$\text{New 12\% Preference Shares (K}_p\text{)} = \frac{PD}{NP} = \frac{\text{Rs. 1.25}}{\text{Rs.9.90}}$$

$$= 0.1263 \text{ or } 12.63\%$$

Where,

I = Interest

t = Tax rate

PD = Preference dividend

NP = Net proceeds

$$\begin{aligned} \text{(b) Equity Shares (Retained Earnings) (K}_e\text{)} \\ &= \frac{\text{Expected Dividend (D}_1\text{)}}{\text{Current Marketprice (P}_0\text{)}} + \text{Growth Rate (G)} \\ &= \frac{50\% \text{ of Rs. 3.023}}{\text{Rs. 30.25}} + 0.11^* = 0.16 \text{ or } 16\% \end{aligned}$$

* Growth rate (on the basis of EPS) is calculated as below:

$$= \frac{\text{EPS in current year} - \text{EPS in previous year}}{\text{EPS in previous year}} = \frac{\text{Rs. 3.023} - \text{Rs. 2.723}}{\text{Rs. 2.723}} = 0.11$$

(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 $\left(\frac{\text{Rs. 3,02,300}}{80} \times 100 \right) = \text{Rs. 3,77,875}$

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:

$$K_e = \frac{\text{Expected dividend (D}_1\text{)}}{\text{Current market price (P}_0\text{)}} + \text{Growth rate(g)} = \frac{50\% \text{ of Rs. } 3.023}{\text{Rs. } 22} + 0.11$$

$$= 0.1787 \text{ or } 17.87\%$$

Calculation of marginal cost of capital (assuming the existing capital structure will be maintained):

Source of capital	Weight	Cost (%)	WACC (%)
	(a)	(b)	(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 :

- 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.
- Preference stock, redeemable after eight years, is currently selling at Rs.150 per shares.
- 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 :

- Equity Share Capital

- (ii) Preference Share Capital
- (iii) Convertible Debenture
- (iv) Retained Earnings
- (v) Term Loan

SOLUTION :**(i) Cost of Equity Share capital**

$$\begin{aligned}
 \text{As per CAPM Model } K_e &= R_f + \beta (R_m - R_f) \\
 R_f &= 6\% \\
 \beta &= 1.54 \\
 R_m - R_f &= 8\% \\
 K_e &= 6\% + 1.54(8\%) \\
 K_e &= \mathbf{18.32\%}
 \end{aligned}$$

(ii) Cost of Preference Share capital

$$\begin{aligned}
 n &= 8 \\
 \text{Net Proceeds (NP)} &= 150 \\
 \text{Redemption Value (RV)} &= 100 \\
 \text{Preference Dividend (PD)} &= 15
 \end{aligned}$$

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_p = \frac{15 + \left(\frac{100 - 150}{8} \right)}{\left(\frac{100 + 150}{2} \right)}$$

$$K_p = \mathbf{7\%}$$

Alternatively, if we take NP as 100 and RV as 100, then solution can be done in the following way:

Cost of Preference Share capital

$$\begin{aligned}
 n &= 8 \\
 \text{Net Proceeds (NP)} &= 100 \\
 \text{Redemption Value (RV)} &= 150 \\
 \text{Preference Dividend (PD)} &= 15
 \end{aligned}$$

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_p = \frac{15 + \left(\frac{150 - 100}{8} \right)}{\left(\frac{150 + 100}{2} \right)}$$

$K_p = 17\%$

(iii) Cost of convertible debenture

Cash Redemption Value (RV) = 100

Share Redemption Value (RV):

Value of share after 5 years = $25 \times (1.06)^5 = 33.46$

Share Redemption Value (RV) = $33.46 \times 4 = 133.82$

Therefore, investor will choose share redemption.

Redemption Value (RV) = 133.82

Net Proceeds (NP) = 100

$n = 5$

Interest (I) = 13

Tax (t) = 25%

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$= \frac{13(1-0.25) + \frac{(133.82 - 100)}{5}}{\frac{(133.82 + 100)}{2}}$$

$K_d = 14.13\%$

(iv) Cost of Retained Earnings

$K_r = K_e (1 - t_p) = 18.32\% \times (1 - 0.20) = 14.66\%$

We can also take cost of equity as cost of retained earnings,

Accordingly, $K_r = K_e = 18.32\%$

(v) Cost of Term Loan

$= 11\% \times (1 - 0.25) = 8.25\%$

QUESTION 23 : RTP – SEPT 2024

BS Ltd. has the following capital structure at book-value as on 31st March, 2024:

Particulars	(Rs.)
Equity share capital (10,00,000 shares)	3,00,00,000
11.5% Preference shares	60,00,000
10% Debentures	1,00,00,000
	4,60,00,000

The equity shares of the company are sold for Rs. 300. It is expected that the company will pay next year a dividend of Rs. 15 per equity share, which is expected to grow by 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

- COMPUTE weighted average cost of capital (WACC) of the company based on the existing capital structure.
- COMPUTE the new WACC, if the company raises an additional Rs. 50 lakhs debt by issuing 10 years 12% debentures but the yield on debentures of similar maturity and risk class is

13%; flotation cost is 2%. Face value of the debenture is Rs.100. This would result in increasing the expected equity dividend to Rs. 20 and leave the growth rate unchanged, but the price of equity share will fall to Rs. 250 per share.

SOLUTION :**(i) Computation of Weighted Average Cost of Capital based on existing capital structure**

Source of Capital	Existing Capital structure (Rs.)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) × (b)
Equity share capital (W.N.1)	3,00,00,000	0.652	10.00	6.52
11.5% Preference share capital	60,00,000	0.130	11.50	1.50
10% Debentures (W.N.2)	1,00,00,000	0.218	6.50	1.42
Total	4,60,00,000	1.000		9.44

Working Notes:

1. Cost of Equity Capital:

$$\begin{aligned}
 K_e &= \frac{\text{Expected dividend}(D_1)}{\text{Current Market Price}(P_0)} + \text{Growth}(g) \\
 &= \frac{\text{Rs.15}}{\text{Rs.300}} + 0.05 \\
 &= 10\%
 \end{aligned}$$

2. Cost of 10% Debentures

$$\begin{aligned}
 K_d &= \frac{\text{Interest}(1-t)}{\text{Net proceeds}} \\
 &= \frac{\text{Rs.10,00,000}(1 - 0.35)}{\text{Rs.1,00,00,000}} \\
 &= 0.065 \text{ or } 6.5\%
 \end{aligned}$$

(ii) Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure (Rs.)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) × (b)
Equity share capital (W.N.3)	3,00,00,000	0.588	13.00	7.64
11.5% Preference share capital	60,00,000	0.118	11.50	1.36
10% Debentures (W.N.2)	1,00,00,000	0.196	6.50	1.27
12% Debentures (W.N.4)	50,00,000	0.098	9.21	0.90
Total	5,10,00,000	1		11.17

Working Notes:

3. Cost of Equity Capital:

$$K_e = \frac{\text{Rs.20}}{\text{Rs.250}} + 0.05$$

$$= 13\%$$

4. Cost of 12% Debentures

$$K_d = \frac{I(1-t) + \left(\frac{RV-NP}{n} \right)}{\frac{RV+NP}{2}}$$

$$= \frac{\text{Rs.12}(1-0.35) + \left(\frac{\text{Rs.100}-\text{Rs.90.31}^*}{10 \text{ years}} \right)}{\frac{\text{Rs.100}+\text{Rs.90.31}^*}{2}}$$

$$= \frac{\text{Rs.8.769}}{\text{Rs.95.155}} = 0.0921$$

*Since yield on similar type of debentures is 13 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

= Rs. 12 ÷ 0.13 = Rs. 92.31

Sale proceeds from debentures = Rs. 92.31 – Rs. 2 (i.e., floatation cost) = Rs. 90.31

QUESTION 24 : PAPER – SEPT 2024

Capital structure of T Limited as on 1st April,2024 is as under :

	Rs.
Equity Share Capital (Rs. 10 per share)	50,00,000
10% Debentures (Rs. 100 per Debenture)	40,00,000
12% Preference Share Capital (10,000 shares of Rs. 100 each)	10,00,000

Additional Information:

- The risk free rate of return is 10%. The Beta of T Ltd. is 1.75 and the return on market portfolio is 12%. The Equity shares have a current market price of Rs. 70 per share.
- The debentures are trading at a market price of Rs. 80 per debenture. The Debentures are to be redeemed after 5 years at par.
- Preference shares are redeemable after 5 years at a premium of 5%, presently selling at Rs. 104 per share.
- The Company pays tax at a rate of 30%.
- The Cost of Debentures are to be calculated on Yield to Maturity approach.
- The present value factors at 10% and 14% are:

Year	1	2	3	4	5
PVIF _{0.10,t}	0.909	0.826	0.751	0.683	0.621
PVIF _{0.14,t}	0.877	0.769	0.675	0.592	0.519

You are required to calculate Weighted Average Cost of Capital (after tax) of T Limited using Market value weights.

SOLUTION :**Cost of Equity Share Capital using Capital Asset Pricing Model (CAPM) Approach**

$$K_e = R_f + \beta (R_m - R_f)$$

$$K_e = 0.10 + 1.75 (0.12 - 0.10)$$

$$= 0.10 + 1.75 (0.02) = 0.135 \text{ or } 13.5\%$$

Cost of Redeemable Debentures using Yield to Maturity (YTM) Approach**Step-1: Identification of relevant cash flows**

Year	Cash flows
0	Current market price (P0) = Rs. 80
1 to 5	Interest net of tax $[I(1-t)] = 10\%$ of Rs. 100 $(1-0.30) = \text{Rs. } 7$
5	Redemption value (RV) = Face value i.e. Rs. 100

Step- 2: Calculation of NPVs at two discount rates

Year	Cash flows (Rs.)	Discount factor @ 10% (L)	Present Value (Rs.)	Discount factor @ 14% (H)	Present Value (Rs.)
0	80	1.000	(80.000)	1.000	(80.000)
1 to 5	7	3.790	26.530	3.432	24.024
5	100	0.621	62.100	0.519	51.900
NPV			+8.630		-4.076

Step- 3: Calculation of Cost of Debentures (Kd)

$$K_d = L + \frac{NPVL}{NPVL-NPVH} (H-L) = 10\% + \frac{\text{Rs.}8.630}{\text{Rs.}8.630 - (\text{Rs.}-4.076)} (14\%-10\%) = 12.72\%$$

Cost of Redeemable Preference Share Capital using approximation method

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV+NP)}{2}}$$

$$K_p = \frac{12 + \left(\frac{105 - 104}{5} \right)}{\left(\frac{105 + 104}{2} \right)}$$

$$= 11.67\%$$

Calculation of WACC using market value weights

Source of Capital	Market Value	Weights	After tax cost of capital	WACC (K _o)
	(Rs.)	(a)	(b)	(c) = (a) x (b)

Equity Share Capital (Rs. 70 × 5,00,000 equity shares)	3,50,00,000	0.8919	0.1350	0.1204
10% Debentures (Rs. 80 × 40,000)	32,00,000	0.0816	0.1272	0.0104
12% Preference Share Capital (Rs. 104 × 10,000 shares)	10,40,000	0.0265	0.1167	0.0031
	3,92,40,000	1.0000		0.1339

WACC (K_o) = 0.1339 or 13.39%

QUESTION 25 : RTP – JAN 2025

The Capital Structure of Samyaktva Limited is as follows:

	Amount (in Rs.)
12% Debentures	3,50,000
14% Pref. Shares	4,50,000
Equity shares (Face value of Rs. 10 each)	8,50,000
	16,50,000

Additional Information:

- Rs. 100 per debentures redeemable at premium of 6% with floatation cost of 5% & 5 years of maturity. The current market price of the debenture is Rs. 115
- Rs. 100 per preference shares redeemable at a premium of 10%, issued at discount of 2% with a floatation cost of 5% on the issue price. The current market price per preference share is Rs. 108. It has maturity of 10 years
- An equity share has a floatation cost of Rs. 5 with a market price per share currently quoted at Rs. 30. Samyaktva Limited paid a last dividend of Rs. 4 and the company is expected to give an annual growth rate of 9% on the dividends. The company has a practice of paying all the earnings in the form of dividends.
- Corporate Taxation rate is at 25%

CALCULATE WACC using market value weights

SOLUTION :

WN 1: Calculation of Cost of Debt

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$RV = 100 + 6\% = 106$$

$$n = \text{term} = 5 \text{ years}$$

$$t = \text{tax} = 0.25$$

$$NP = \text{Issue Price} - \text{Floatation cost}$$

= 115 – 5% (Issue price will be at Market price and no Face Value)

= 109.25

$$K_d = \frac{12(1 - 0.25) + \frac{(106 - 109.25)}{5}}{\frac{(106 + 109.25)}{2}}$$

Therefore **Kd = 7.76%**

WN 2: Calculation of Cost of Preference Shares

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

RV = 100 + 10% = 110

n = term = 10 years

NP = Issue Price – Floatation cost

Issue Price = (108 – 2%) = 105.84

Net Proceeds = 105.84 (-) 5% = 100.55

$$K_p = \frac{14 + \frac{(110 - 100.55)}{10}}{\frac{(110 + 100.55)}{2}}$$

Therefore **Kp = 14.19%**

WN 3: Calculation of Cost of Equity

Since growth rate is given, Ke is to be calculated by using Gordon's formula

As per Gordon,

$$K_e = \frac{D_1}{P_0} + g$$

Where, D1 = Expected dividend at the end of Year 1

Po = Current Market Price (–) Floatation cost

G = growth rate in dividends

$$K_e = \frac{4 + 9\% \times 4}{30 - 5} + 0.09$$

Ke = 26.44%

Calculation of WACC using Market Value Weights

Sources	Amount of Capital (Rs.)	Weights (W)	Cost (K)	W X K
Debentures	4,02,500 (3,500 x 115)	0.1171	7.76 (WN 1)	0.9087
Preference shares	4,86,000 (4,500 x 108)	0.1413	14.19 (WN 2)	2
Equity shares	25,50,000 (85,000 x 30)	0.7416	26.44 (WN 3)	19.6079
	34,38,500			Ko = 22.52%

QUESTION 26 : PAPER – JAN 2025

The following information pertain to CMC Limited:

Number of Equity Shares	20,00,000
Book Value of 10% Convertible Debentures	Rs. 1,00,00,000
Book Value of 12% Bank Term Loan	Rs. 25,00,000
Market Price of Equity Share	Rs. 55
Market Value of 10% Convertible Debenture	Rs. 108
Face Value of Equity Share	Rs. 10
Face Value of 10% Convertible Debenture	Rs. 100
Beta coefficient of Equity shares of CMC Ltd.	1.5
Risk free rate of return	4.50%
Equity risk Premium	9%
Rate of taxation	30%

The company expects that the share prices will rise in future at an average rate of 6% per annum. The 10% convertible debentures of 100 each will be converted in six years' time into equity shares of the company in the ratio of 1: 4 (4 equity shares for each debenture).

The market value of 12% bank term loan is at par.

You are required to calculate:

- Cost of Equity Share Capital by applying Capital Asset Pricing Model (CAPM) Approach
- Cost of Convertible Debenture by using approximation method,
- Cost of Bank Term Loan
- Weighted Average Cost of Capital using Market Value weights

SOLUTION :**(i) Cost of equity share**

$$R_f = 4.5\%$$

$$R_m - R_f = 9\%$$

$$B = 1.5$$

Using CAPM,

$$K_e = R_f + \beta (R_m - R_f)$$

$$= 4.5\% + 1.5 (9\%)$$

$$= 18\%$$

(ii) Cost of convertible debenture (based on Market Value)

$$\text{Price of share after 6 years} = 55 (1+0.06)^6$$

$$= \text{Rs. } 78.018$$

$$\text{Redemption Value of Debenture (RV)} = 78.018 \times 4 = \mathbf{312.07 \text{ (RV)}}$$

$$\text{NP} = 108 \text{ (MV)}$$

$$n = 6$$

$$K_d = \frac{\text{INT}(1-t) + \left(\frac{\text{RV} - \text{NP}}{n} \right)}{\frac{(\text{RV} - \text{NP})}{2}} \times 100$$

$$= \frac{10(1 - 0.3) + \frac{(312.07 - 108)}{6}}{\frac{(312.07 + 108)}{2}} \times 100$$

$$= \frac{7 + 34.012}{210.035} \times 100$$

$$K_d = 19.52\%$$

(iii) Cost of bank term loan

$$K_d = I(1 - t)$$

$$= 12\% (1 - 0.3) = 8.4\%$$

(iv) Calculation of Weighted Average Cost of Capital (WACC) using Market Value Weights

Source	(Rs.) in lakhs	Weight	Cost of Capital after tax	WACC
Equity Share Capital	11,00,00,000	0.892	0.180	0.1606
10% Convertible Debenture	1,08,00,000	0.088	0.195	0.0171
12% Bank Term Loan	25,00,000	0.020	0.084	0.0017
Total	12,33,00,000	1		0.1794

$$WACC = 17.94\%$$

Alternative Solution to Part (ii) and (iv)

(ii) Cost of convertible debenture

$$\text{Price of share after 6 years} = 55 (1 + 0.06)^6$$

$$= \text{Rs. } 78.018$$

$$\text{Redemption Value of Debenture (RV)} = 78.018 \times 4 = \mathbf{312.07} \text{ (RV)}$$

$$NP = 100$$

$$n = 6$$

$$K_d = \frac{\text{INT}(1 - t) + \left(\frac{RV - NP}{n} \right)}{\frac{(RV - NP)}{2}} \times 100$$

$$= \frac{10(1 - 0.3) + \frac{(312.07 - 100)}{6}}{\frac{(312.07 + 100)}{2}} \times 100$$

$$= \frac{7 + 35.345}{206.035} \times 100$$

$$K_d = 20.55\%$$

(iv) Calculation of Weighted Average Cost of Capital (WACC) using Market Value Weights

Source	(Rs.) in lakhs	Weight	Cost of Capital after tax	WACC
Equity Share Capital	11,00,00,000	0.892	0.180	0.1606
10% Convertible Debenture	1,08,00,000	0.088	0.205	0.0180

12% Bank Term Loan	25,00,000	0.020	0.084	0.0017
Total	12,33,00,000	1		0.1803

WACC = 18.03%

QUESTION 27 : RTP – MAY 2025

Paramhans Limited has a capital structure that consists of Equity share capital, Reserves & Surplus, Bank term loan, Debentures which are redeemable at a premium of 5% and Preference share capital redeemable at premium of 5%. The coupon rate on debentures is 1.5 times of that of bank term loan coupon rate whereas the preference dividend rate is 1.5 times of debentures' interest rate. Tenure for the bank term loan, debentures and preference share capital is 3 years, 5 years and 7 years respectively.

The current book value of the capital structure is as follows –

Particulars	Amount (Rs.)
Equity Share Capital (FV = Rs. 100)	25,00,000
Reserves And Surplus	10,00,000
Bank Term Loan	10,00,000
Debentures (FV = Rs. 100)	15,00,000
Preference Share Capital (FV = Rs. 100)	20,00,000
TOTAL	80,00,000

Tax rate applicable to the company is 25%.

Debentures are currently selling at a price of Rs. 96 whereas Preference shares are currently selling at Rs. 102. The equity shares of the company are quoted at Rs. 150 per share. The ongoing P/E ratio for the shares of Paramhans Limited is at 6.667 times. Paramhans Limited belongs to a risk class where the overall capitalization and discounting rate of the company is at 20%

CALCULATE –

- (A) Rate of Interest on Bank term Loan & Debentures
- (B) Rate of Preference dividend
- (C) WACC using Market Value weights

SOLUTION :

- (A) Calculation of Interest rate on Bank term Loan & Debentures

Let the rate of interest on bank term loan be 'X'

Therefore, Rate of Interest on debentures = 1.5X

Rate of Preference dividend = 1.5 x 1.5X = 2.25X (1.5 times of debentures interest rate)

Now, let's calculate Kd (term loan), Kd (debentures), Kp (Pref. shares) & Ke

$$\begin{aligned} K_d (\text{Term loan}) &= \text{Int} (1 - t) \\ &= X (1 - 0.25) \end{aligned}$$

Kd (Term loan) = 0.75X

$$K_d (\text{Debentures}) = \frac{I(1 - t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$RV = 100 + 5\% = \text{Rs. } 105$$

NP = Issue Price / Market price = Rs. 96

$$= \frac{150X(1 - 0.25) + \frac{(105 - 96)}{5}}{\frac{(105 + 96)}{2}}$$

Kd (Debentures) = $\frac{112.5 \times 1.8}{100.5}$
 $PD + \frac{(RV - NP)}{n}$

Kp = $\frac{n}{(RV + NP)}$

RV = 100 + 5% = Rs. 105

NP = Issue price / Market price = Rs. 102

Therefore **Kp** = $\frac{225X + (105 - 102 / 7)}{(105 + 102) / 2}$

Kp = $\frac{225X + 0.4286}{103.5}$

Ke = $\frac{1}{PE \text{ Ratio}}$
 $= \frac{1}{6.667}$

Therefore, **Ke** = 15%

Kr = Ke = 15% (In absence of information on opportunity cost)

Overall Capitalization rate (Ko) = 20% (given)

Sources of capital	Amount of capital	Weights (W)	Cost (K)	W x K
Equity share capital	25,00,000	0.3125	15	4.6875
Reserves & surplus	10,00,000	0.1250	15	1.875
Bank term loan	10,00,000	0.1250	0.75X	0.09375X
Debentures	15,00,000	0.1875	$\frac{112.5X + 1.8}{100.5}$	$\frac{21.094X + 0.3375}{100.5}$
Preference share capital	20,00,000	0.2500	$\frac{225X + 0.4286}{103.5}$	$\frac{56.25X + 0.1072}{103.5}$
	80,00,000	1.0000	Ko /WACC	20%

$$20 = 4.6875 + 1.8750 + 0.09375X + \frac{21.094X + 0.3375}{100.5} + \frac{56.25X + 0.1072}{103.5}$$

On solving the above equation,

$$13.4375 = 0.09375X + \frac{(2183.2X + 34.931 + 5653.125X + 10.774)}{10,401.75}$$

$$1,39,773.52 = 975.16X + 2,183.2X + 5,653.125X + 45.705$$

$$1,39,727.815 = 8,811.485X$$

$$X = \text{Rate of Interest on Bank term Loan} = 15.86\%$$

$$\text{Rate of Interest on Debentures} = 15.86 \times 1.5 = 23.79\%$$

$$\text{Rate of Preference Dividend} = 15.86 \times 2.25 = 35.68\%$$

(B) Calculation of WACC using Market Value weights

Sources	Market value	Weights (W)	Cost (K)	W x K
Equity share capital	37,50,000	0.456	15.000	6.83
Bank term loan	10,00,000	0.122	12.023	1.46
Debentures	14,40,000	0.175	18.034	3.16
Preference share capital	20,40,000	0.248	27.051	6.71
Total	82,30,000	1	Ko /WACC	18.16

WN – Calculation of Market Value of each capital sources

MV of Equity = 25,000 x 150 = 37,50,000

**MV of Reserves & Surplus = Already Included in the Equity Above

MV of Term Loan = 10,00,000

MV of Debentures = 15,000 x 96 = 14,40,000

MV of Pref. Shares = 20,000 x 102 = 20,40,000

QUESTION 28 : PAPER – MAY 2025

Capital structure of B Ltd. for the year ended 31st March, 2025 are as follows:

Particulars	Amount (Rs.)
Equity share capital @Rs.10 each	14,00,000
10% Preference share capital @Rs.1,000 each	10,00,000
Debenture @ Rs.100 each	9,60,000
Bank Loan	6,40,000

- Risk-free rate of return is 14%, Market rate of return is 19% and beta of company is 1.20.
- 10% Preference shares are redeemable at Rs. 1,065.40 after 3 years.
- Interest on bank loan is 1.30 times of interest on debentures.
- Debentures are redeemable at par after 5 years. Floatation cost is Rs. 4 per debenture.
- Tax rate is 30%.
- Cost of capital is 14%.

You are required to calculate the following:

- Cost of Equity.
- Cost of preference share using YTM method.
- Post-tax cost of debenture using approximation method.
- Interest rate of bank loan.

PV factors @ 10% and 14%

Year	1	2	3	4
PVIF _{0.10, t}	0.909	0.826	0.751	0.683
PVIF _{0.14, t}	0.877	0.769	0.675	0.592

SOLUTION :

(i) Calculation of Cost of Equity

$$K_e = R_f + \beta (R_m - R_f) = 14\% + 1.2 (19\% - 14\%) = 20\%$$

(ii) Calculation of Cost of Preference Shares:Current Market Price P₀

= Preference Dividend (PD) X PVAF (r,14) + Redeemable Value (RV) X PVIF (r,14)

Or 1000 = 100 x PVAF (r,14) + 1065.4 x (r,14)

Calculation of NPV at discount rate of 10% and 14%

Year	Cash Flows (Rs.)	PVF @ 10%	PV (Rs.)	PVF @ 14%	PV (Rs.)
0	(1000)	1	(1000)	1	(1000)
1-3	100	2.487	248.70	2.322	232.20
3	1065.4	0.751	800.12	0.675	719.14
			+48.82		-48.66

$$\text{IRR} = 10\% + \frac{48.82}{48.82 - (-48.66)} \times (14\% - 10\%)$$

$$= 10\% + \frac{48.82}{97.48} \times 4\%$$

$$= 10\% + 2\% = 12\%$$

(iii) Calculation of Post-tax Cost of Convertible Debentures:**Working Note:**

Calculation of Interest rate on Bank term Loan & Debentures

Let the rate of interest on debentures be 'X'

Therefore, Rate of Interest on bank loan = 1.3X x (0.7) = 0.91X

$$\begin{aligned} K_d = (\text{Debentures}) &= \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} \\ &= \frac{100X(1-0.3) + \frac{(100-96)}{5}}{\frac{(100+96)}{2}} \\ &= \frac{70X + 0.8}{98} \end{aligned}$$

Sources of capital	Amount of capital	Weights (W)	Cost (K)	W x K
Equity share capital	14,00,000	0.35	0.20	0.07
Preference share capital	10,00,000	0.25	0.12	0.03
Debentures	9,60,000	0.24	$\frac{70X + 0.8}{98}$	$\frac{16.8X + 0.192}{98}$
Bank Loan	6,40,000	0.16	0.91X	0.16 x 0.91X
	40,00,000	1.00		0.14

$$0.14 = 0.07 + 0.03 + \frac{16.8X + 0.192}{98} + 0.16 \times (0.91X)$$

$$0.04 \times 98 = 16.8X + 0.192 + 14.2688X$$

$$3.728 = 31.0688X$$

$$X = 0.1199 \text{ or } 12\%$$

So, interest on debentures = 12 %

$$\begin{aligned} K_d (\text{Debentures}) &= \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} \\ &= \frac{12(1-0.3) + \frac{(100-96)}{5}}{\frac{(100+96)}{2}} \\ &= \frac{8.4 + 0.8}{98} = 9.387\% \text{ or } 9.39\% \end{aligned}$$

(iv) Interest Rate of bank loan

$$= 12 \times 1.3 = 15.60\%$$

QUESTION 29 : RTP – SEPT 2025

Lavanya Limited wishes to raise additional finance of Rs. 20 lakhs for meeting its investment plans. It has Rs. 4,20,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / Equity mix	3:7
(2)	Cost of debt:	
	Upto Rs. 3,60,000	8% (before tax)
	Beyond Rs. 3,60,000	12% (before tax)
(3)	Earnings per share	Rs. 5
(4)	Dividend pay out	40% of earnings
(5)	Retained Earnings	60%
(6)	Rate of Return on Retained Earnings	10%
(7)	Current market price per share	Rs. 53
(8)	Tax rate	30%

You are required to:

- DETERMINE the pattern for raising the additional finance.
- DETERMINE the post-tax average cost of additional debt.
- DETERMINE the cost of retained earnings and cost of equity.
- COMPUTE the overall weighted average after tax cost of additional finance.

SOLUTION :

(a) Pattern for raising the additional finance:

$$\text{Equity} \quad 70\% \text{ of Rs. } 20,00,000 = \text{Rs. } 14,00,000$$

$$\text{Debt} \quad 30\% \text{ of Rs. } 20,00,000 = \text{Rs. } 6,00,000$$

The capital structure after raising additional finance:

	(Rs.)
Shareholders' funds	

Equity Capital	(Rs. 14,00,000 – Rs. 4,20,000)	9,80,000
Retained earnings		4,20,000
Debt (Interest at 8% p.a.)		3,60,000
(Interest at 12% p.a.)	(Rs. 6,00,000 – Rs. 3,60,000)	2,40,000
Total Funds		20,00,000

(b) Determination of post-tax average cost of additional debt:

$$K_d = I(1 - t)$$

Where,

I = Interest Rate

t = Corporate tax-rate

On Rs. 3,60,000 = 8% (1 – 0.3) = 5.6% or 0.056

On Rs. 2,40,000 = 12% (1 – 0.3) = 8.4% or 0.084

Average Cost of Debt

$$= \frac{(Rs. 3,60,000 \times 0.056) + (Rs. 2,40,000 \times 0.084)}{Rs. 6,00,000} \times 100 = 6.72\%$$

(c) Determination of cost of retained earnings and cost of equity by applying Dividend growth model:

$$K_e \text{ or } K_r = \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g$$

Where,

D₀ = Dividend paid = 40% of EPS = 40% × Rs. 5 = Rs. 2g = Growth rate = Retained Earnings × Rate of Return
= 0.6 × 0.10 = 0.06 or 6%P₀ = Current market price per share = Rs. 53

$$K_e \text{ or } K_r = \frac{2(1+0.06)}{53} = \frac{2.12}{53} + 0.06 = 0.04 + 0.06 = 0.10 \text{ or } 10\%$$

(d) Computation of overall weighted average after tax cost of additional finance:

Particulars	Amount (Rs.)	Weights	Cost of funds	Weighted Cost (%)
Equity (including retained earnings)	14,00,000	0.70	10%	7
Debt	6,00,000	0.30	6.72%	2.016
WACC	20,00,000			9.016

QUESTION 30 : PAPER – SEPT 2025

The capital structure of RSA Limited is as under:

	(Rs.)
Equity Shares (Rs. 10 per share)	1,00,00,000
8% Irredeemable Preference Shares (Rs.100 per share)	5,00,00,000

Additional Information:

- (i) Equity shares are quoted at Rs. 60 each and a new issue priced at Rs. 60 will be fully subscribed; flotation cost will be Rs. 4 per share.
- (ii) Issue price of the 8% Irredeemable preference shares was Rs. 45.
- (iii) Current market price of the 8% irredeemable preference shares is Rs. 55.

RSA Limited has been paying dividend to its equity shareholders at a constant growth rate of 5% per year and the dividend paid this year was Rs. 2 per equity share.

You are required to calculate:

- (i) The cost of equity using Gordon's model
- (ii) The cost of the irredeemable preference share
- (iii) The weighted average cost of capital using market value weights.

SOLUTION :

$$\begin{aligned}
 \text{(i)} \quad K_e &= \frac{D_1}{P_0 - F} + g \\
 &= \frac{2(1 + 0.05)}{60 - 4} + 5 \\
 &= 8.75\%
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad K_p &= \frac{PD}{P_0} \\
 &= \frac{8}{45} \\
 &= 17.78\%
 \end{aligned}$$

- (iii) **Calculation of WACC using market value weights**

Source of capital	Market Value (Rs.)	Weights (a)	Cost of capital (b)	WACC (K _o) (c) = (a) × (b)
Equity shares	6,00,00,000	0.6857	0.0875	0.0600
Preference shares	2,75,00,000	0.3143	0.1778	0.0559
	8,75,00,000	1		0.1159

WACC (K_o) = 0.1159% or 11.59%

If P₀ is taken as current market price for calculation of preference share

$$\begin{aligned}
 \text{(ii)} \quad K_p &= \frac{PD}{P_0} \\
 &= \frac{8}{55} \\
 &= 14.55\%
 \end{aligned}$$

- (iii) **Calculation of WACC using market value weights**

Source of capital	Market Value (Rs.)	Weights (a)	Cost of capital (b)	WACC (K _o) (c) = (a) × (b)
Equity shares	6,00,00,000	0.6857	0.0875	0.06
Preference shares	2,75,00,000	0.3143	0.1778	0.0457
	8,75,00,000	1		0.1057

WACC (Ko) = 0.1057% or 10.57%

QUESTION 31 : PAPER – SEPT 2025

A company issues 20,000, 18% Debentures of Rs.100 each. The debentures are redeemable after a period of 8 years. The cost of debentures using approximation method is 14.58%. The corporate tax rate is 30%. You are required to calculate:

- Issue price of the Debentures, if redeemable at par.
- Revised Cost of Debentures using approximation method, if redeemable at 10% Premium after 8 years.

SOLUTION :

$$\begin{aligned}
 \text{(i) Cost of Redeemable Debenture (Kd)} &= \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} \\
 0.1458 &= \frac{18(1 - 0.3) + \frac{(100 - NP)}{8}}{\frac{(100 + NP)}{2}} \\
 0.1458 &= \frac{(100.8 + 100 - NP) \times 2}{800 + 8NP} \\
 116.64 + 1.166NP &= 401.6 - 2NP \\
 3.166 NP &= 284.96 \\
 NP &= 90
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) Revised Cost of Redeemable Debenture (Kd)} &= \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} \\
 &= \frac{18(1 - 0.3) + \frac{(110 - 90)}{8}}{\frac{(110 + 90)}{2}} \\
 &= 15.1\%
 \end{aligned}$$

QUESTION 32 : RTP – JAN 2026

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 share 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 at par, is currently selling at Rs. 150 per share.
- (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%.

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

SOLUTION :

(i) Cost of Equity Share capital

$$\text{As per CAPM Model } K_e = R_f + \beta (R_m - R_f)$$

$$R_f = 6\%$$

$$\beta = 1.54$$

$$R_m - R_f = 8\%$$

$$K_e = 6\% + 1.54(8\%)$$

$$K_e = 18.32\%$$

(ii) Cost of Preference Share capital

$$n = 8$$

$$\text{Net Proceeds (NP)} = 150$$

$$\text{Redemption Value (RV)} = 100$$

$$\text{Preference Dividend (PD)} = 15$$

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_p = \frac{15 + \left(\frac{100 - 150}{8} \right)}{\left(\frac{100 + 150}{2} \right)}$$

$$K_p = 7\%$$

(iii) Cost of convertible debenture

$$\text{Cash Redemption Value (RV)} = 100$$

$$\text{Share Redemption Value (RV):}$$

$$\text{Value of share after 5 years} = 25 \times (1.06)^5 = 33.455$$

$$\begin{aligned}
 \text{Share Redemption Value (RV)} &= 33.455 \times 4 = 133.82 \\
 \text{Therefore, investor will choose share redemption.} \\
 \text{Redemption Value (RV)} &= 133.82 \\
 \text{Net Proceeds (NP)} &= 100 \\
 n &= 5 \\
 \text{Interest (I)} &= 13 \\
 \text{Tax (t)} &= 25\% \\
 K_d &= \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} \\
 &= \frac{13(1 - 0.25) + \frac{(133.82 - 100)}{5}}{\frac{(133.82 + 100)}{2}} \\
 K_d &= 14.13\%
 \end{aligned}$$

(iv) Cost of Retained Earnings

$$K_r = K_e = 18.32\%$$

(v) Cost of Term Loan

$$= 11\% \times (1 - 0.25) = 8.25\%$$

QUESTION 33 : PAPER – JAN 2026

The Balance Sheet extract of ST Ltd. as on March 31 (current year) is as follows:

Liabilities	Amount (Rs. in lakh)	Assets	Amount (Rs. in lakh)
Share capital	260	Fixed Assets	600
Reserves	168	Inventories	360
Long-term loans	420	Receivables	270
Short-term loans	220	Cash & bank	78
Payables	144		
Provisions	96		
	1,308		1,308

Sales for the current year amounted to Rs. 900 lakh. For the next financial year ending March 31 (next year), sales are expected to increase by 20%.

The net profit margin (after tax) is expected to be 5% of sales, and the dividend payout ratio is anticipated to be 50%.

Total assets including cash & bank and current liabilities (payables and provisions) vary directly with sales.

You are required to:

- (i) Estimate the amount of external funds required (EFR) for the next financial year.

- (ii) Determine the sources and composition of funds to meet the requirement, given the following parameters:
- (1) The current ratio must be maintained at 1.40.
 - (2) The ratio of fixed assets to long-term loans should be 1.50.
 - (3) The remaining fund is raised by issue of Equity shares.
 - (4) The additional funds are to be raised in the following order of preference:
 - (i) Short-term bank borrowings
 - (ii) Long-term loans
 - (iii) Equity

SOLUTION :**(i) External Funds Requirement (EFR)**

Particulars	Rs. in lakhs
Expected sales (Rs. 900 + 20% of Rs. 900)	1,080.00
Net profit margin @ 5%	54.00
Dividend payout ratio @ 50%	27.00
Balance to be ploughed back (A)	27.00
Additional assets required $[(Rs.1,308 - (144+96)^*] \times 20\%$ (B)	213.60
Balance to be met from external sources (B – A)	186.60

*As total assets and current liabilities (payables & provisions) increase proportionately with sales.

Calculation of External Funds Requirement (EFR) can be presented in the following way-

Particulars	Rs. in lakhs
A. Projected Level of Assets (1308 x 1.20)	1,569.60
B. Projected Level of Payables & Provisions (144+96) x 1.20	288.00
C. Retained Earnings (900 x 1.20 x 0.05 x 0.50)	27.00
D. Existing (Share Cap. + Reserves + LTL + STL) (260+168+420+220)	1068.00
External Funds Requirement (EFR): A - (B+C+D)	186.60

(ii) Amount to be raised from different sources subject to given conditions:

- (1) Amount to be raised from Short-Term Bank Borrowings

Particulars	Rs. in lakhs
A. New Current Assets (708 lakhs + 20% of 708 lakhs)	849.60
B. New current liabilities as per given condition	606.86
C. Less: Existing current liabilities (240 lakhs + 20% of 240 lakhs+220 lakhs)	508.00
D. Additional funds to be raised from Short-term bank borrowings (B-C)	98.86

To maintain Current Ratio = 1.40

$$\text{Required Current Liabilities} = \frac{849.60}{1.40} = 606.86 \text{ lakhs}$$

(2) Amount to be raised from Long-Term Loans

Particulars	Rs. in lakhs
Existing fixed assets	600.00
Increase @ 20%	120.00
New fixed assets	720.00

To maintain fixed assets to long-term loans = 1.50:

$$\text{Long-term loans required} = \frac{720}{1.5} = 480.00 \text{ lakhs}$$

Particulars	Rs. in lakhs
Required long-term loans	480.00
Less: Existing long-term loans	420.00
Amount to be raised from long-term funds	60.00

(3) Amount to be raised from Equity Shares

Particulars	Rs. in lakhs
External funds required	186.60
Less: From short-term funds	98.86
Less: From long-term funds	60.00
Balance to be raised by issue of Equity Shares	27.74

QUESTION 34 : RTP – MAY 2026

Zebra Dynamics Ltd., a diversified engineering firm, is currently undergoing a strategic review of its capital financing. The Board of Directors has set strict hurdles for new project approvals. The Chief Financial Officer (CFO) has stated that the company's Cost of Capital based on Book Value weights is currently 11%, while the Cost of Capital based on Market Value weights is exactly 150 basis points higher.

Market Benchmarking Data

To determine the cost of equity, the finance team has gathered data on two comparable peers, A Ltd. and B Ltd, which operate in the same economic environment. Their returns are driven by the Capital Asset Pricing Model (CAPM):

Security	Beta	Expected CAPM Return
A Ltd.	1.2	15.20%
B Ltd.	0.8	12.80%

Capital Structure:

- **Book Value Terms:** The company maintains a traditional balance sheet with an equal ratio of Equity and Debt.
- **Market Value Terms:** Due to market optimism, the company's equity trades at a premium. The Market Value of Equity is 3 times its Book Value, while the debt trades at par (Market Value of Debt equals Book Value).

Debt Instrument Details

The company's debt capital is raised entirely through Debentures with the following characteristics:

- Coupon Rate: 7% per annum.
- Issue Details: The debentures were issued at a discount of Rs. 10 for Rs. 90.
- Redemption: They are redeemable at Par (Rs. 100).
- Tenure: The debentures mature in 4 years.

You have been hired as a financial consultant to

- PROVIDE a detailed breakdown of the component costs.
- CALCULATE the corporate tax rate applicable to the company assuming Discount on issue or premium on redemption are tax deductible.
- CALCULATE the Beta of the company.

SOLUTION :

- Let the cost of Equity be 'X' and Cost of Debt be 'Y'

Calculation of WACC using Book value weights

Source of Capital	Cost of capital	Weights	WACC (K _o)
	(a)	(b)	(c) = (a) × (b)
Equity Share Capital	X	0.5	0.5X
Long term debts	Y	0.5	0.5Y
			11

Calculation of WACC using market value weights

Source of Capital	Cost of capital	MV Weights	WACC (K _o)
	(a)	(b)	(c) = (a) × (b)
Equity Share Capital	X	3/4 = 0.75	0.75X
Long term debts	Y	1/4 = 0.25	0.25Y
			11 + 1.5 = 12.5

$$0.5X + 0.5Y = 11 \quad \dots(1)$$

$$0.75X + 0.25Y = 12.5 \quad \dots(2)$$

Equating 1 & 2

$$K_e (X) = 14\%$$

Substituting X in Eqn. 1

$$0.5 \times 14 + 0.5Y = 11$$

$$7 + 0.5Y = 11$$

$$\text{Post tax } K_d (Y) = 8\%$$

$$(ii) \quad \text{Pre Tax Cost of Redeemable Debenture } (K_d) = \frac{I + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

Where,

I = Interest payment

NP = Net proceeds

RV = Redemption value of debentures

n = Remaining life of debentures

$$K_d = \frac{7 + \frac{(100 - 90)}{2}}{\frac{(100 + 90)}{2}}$$

$$K_d = \frac{7 + 2.5}{95}$$

Pre Tax K_d = 10%

Post tax K_d = Pre tax K_d (1 – T)

8% = 10%(1 – T)

Tax rate (T) = 20%

(iii) According to CAPM

Cost of Equity (K_e) = $R_f + \beta (R_m - R_f)$

Where,

K_e = Cost of equity capital

R_f = Risk free rate of return

β = Beta coefficient

R_m = Rate of return on market portfolio

($R_m - R_f$) = Market risk premium

14% = 8% + $\beta \times 6\%$

Beta coefficient = 1

Working Note:

A Ltd

15.20 = $R_f + 1.2R_p$ (1)

B Ltd

12.80 = $R_f + 0.8R_p$ (2)

By solving Eqn. 1 & 2,

R_p = 6

So Risk Premium = 6%

Substituting $R_p = 6$ in Eqn 1

15.20 = $R_f + 1.2 \times 6\%$

R_f = 15.20 – 7.20 = 8%

Hence, Risk Free Return = 8%

R_p = $R_m - R_f$

6 = $R_m - 8\%$

R_m = 14%

QUESTION 35 : PAPER – MAY 2026

Z Ltd. has issued 8% convertible debentures of Rs. 100 each with a remaining maturity period of five years. The current market price per debenture is Rs. 85. At the time of maturity, debenture holders have an option to either redeem it at a premium of 5% or to convert each debenture into 5 equity shares. Current market price per equity share is Rs.16. The company has just paid

dividend of Rs. 8.03 per equity share. Seven years ago, it paid dividend of Rs. 5.00 per equity share.

Applicable tax rate is 30%.

Compute the post-tax cost of debentures using present value method.

Year	1	2	3	4	5	6	7
PVIF _{0.10,t}	0.909	0.826	0.751	0.683	0.621	0.564	0.513
PVIF _{0.12,t}	0.893	0.797	0.712	0.636	0.567	0.507	0.452

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 _{i6}	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
FVIF _{i7}	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

SOLUTION :

Calculation of growth rate in dividend

$$8.03 = 5 (1+g)^7$$

$$1.606 = (1+g)^7$$

$$g = 7\%$$

Price of share after 5 years

$$P_5 = 16 \times \text{FVIF } 7\%, 5$$

$$= 16 \times 1.403 = 22.45$$

Conversion value of shares = $22.45 \times 5 = \text{Rs. } 112.25$ (RV)

Redemption Value of Debenture (RV) = $100 + 5\%$ premium = Rs. 105

Since, conversion value is higher, debenture holders will prefer conversion.

After-tax Interest = $8(1-0.30) = \text{Rs. } 5.60$

Year	Cash Inflow (Rs.)	PVIF @ 10%	PV (Rs.)	PVIF @12%	PV (Rs.)
0	85 (Current Market Price)	1	-85	1	-85
1-5	5.60 (Interest)	3.79	21.224	3.605	20.188
5	112.25 (Conversion Value)	0.621	69.707	0.567	63.646
Total PV			5.931		1.166

$$\begin{aligned} \text{IRR} &= L + \frac{\text{NPV}_L}{\text{NPV}_L - \text{NPV}_H} (H - L) \\ &= 10\% + \frac{5.931}{5.931 - (-1.166)} (12\% - 10\%) = 11.67\% \end{aligned}$$

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.

$$= \frac{(EBIT - I_1)(1 - T)}{E_1} = \frac{(EBIT - I_2)(1 - T)}{E_2}$$

EBIT = Earnings before interest and tax.

I₁ = Fixed charges (interest or pref. dividend) under Alternative 1

I₂ = 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.

$$\frac{(EBIT - 0)(1 - 0.3)}{20,000} = \frac{(EBIT - 20,000)(1 - 0.3)}{10,000}$$

$$0.7 \text{ EBIT } (10,000) = (0.7 \text{ EBIT} - 14,000) (20,000)$$

$$7,000 \text{ EBIT} = 14,000 \text{ EBIT} - 28 \text{ crores}$$

- EBIT = 40,000
- (b) Indifference point where EBIT of Plan A and Plan C is equal

$$\frac{(EBIT - 0)(1 - 0.3)}{20,000} = \frac{(EBIT - 20,000)(1 - 0.3)}{10,000}$$

$$0.7 \text{ EBIT } (10,000) = (0.7 \text{ EBIT} - 20,000) (20,000)$$

$$7,000 \text{ EBIT} = 14,000 \text{ EBIT} - 40 \text{ crores}$$

$$\text{EBIT} = 57,142.86$$
- (c) Indifference point where EBIT of Plan B and Plan C are equal

$$\frac{(EBIT - 20,000)(1 - 0.3)}{10,000} = \frac{(EBIT - 0)(1 - 0.3) - 20,000}{10,000}$$

$$(0.7 \text{ EBIT} - 14,000) (10,000) = (0.7 \text{ EBIT} - 20,000) (10,000)$$

$$7,000 \text{ EBIT} - 14 \text{ crore} = 7,000 \text{ EBIT} - 20 \text{ crore}$$
 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:

$$\{(EBIT - I_1) (1 - T)\} / E_1 = \{(EBIT - I_2) (1 - T)\} / E_2$$

$$So = \frac{EBIT(1 - 0.3)}{4,00,000 \text{ Shares}} = \frac{(EBIT - Rs.9,00,000)(1 - 0.3)}{1,00,000 \text{ Shares}}$$

$$\text{Or, } 2.8 \text{ EBIT} - 25,20,000 = 0.7 \text{ EBIT or, } 2.1 \text{ EBIT} = 25,20,000$$

$$\text{EBIT} = 12,00,000$$

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.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 :

- The company may issue 1,00,000 ordinary shares at Rs. 10 per share
- 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
- 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.
- 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?
- 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:

$$EPS_{\text{Alternatives(i)}} = \frac{(\text{EBIT} - \text{Interest}) (1 - \text{Tax Rate})}{\text{No. of equity shares}} = \frac{(\text{EBIT} - 0.14 \times 8,00,000) (1 - 0.3)}{1,20,000 \text{ shares}}$$

In case the alternative (ii) is accepted, then the EPS of the firm would be

$$EPS_{\text{Alternatives(ii)}} = \frac{(\text{EBIT} - \text{Interest}) (1 - \text{Tax Rate}) - \text{PD}}{\text{No. of equity shares}} = \frac{(\text{EBIT} - 0.14 \times 8,00,000) (1 - 0.3) - 0.16 \times 4,00,000}{80,000 \text{ shares}}$$

In order to determine the indifference level of EBIT, the EPS under the two alternative plans should be equated as follows:

$$\frac{(\text{EBIT} - 0.14 \times 8,00,000) (1 - 0.3)}{1,20,000 \text{ shares}} = \frac{(\text{EBIT} - 0.14 \times 8,00,000) (1 - 0.3) - 0.16 \times 4,00,000}{80,000 \text{ shares}}$$

$$\text{Or } 1.40 \text{ EBIT} - \text{Rs. } 1,56,800 = 2.10 \text{ EBIT} - \text{Rs. } 4,27,200$$

$$\text{Or } 0.70 \text{ EBIT} = \text{Rs. } 2,70,400$$

$$\text{Or } \text{EBIT} = 2,70,400 / 0.7$$

$$\text{Or } \text{EBIT} = \text{Rs. } 3,86,285.71 \text{ (approx.)}$$

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) :

$$ROCE = \frac{EBIT}{\text{Capital employed}} \times 100 = \frac{\text{Rs. 4,50,000}}{\text{Rs. 30,00,000}} \times 100 = 15\%$$

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	1,20,000	1,20,000	1,20,000
- New Debt	--	72,000 (Rs. 6,00,000 x 12%)	--
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 $\left(\frac{\text{Rs. 1,98,000}}{80,000} \right)$	2.610 $\left(\frac{\text{Rs. 2,08,800}}{80,000} \right)$	1.800 $\left(\frac{\text{Rs. 2,52,000}}{1,40,000} \right)$

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.

- If the additional funds are raised as debt; and
- 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% on 4,00,000	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

$$\frac{\text{EBIT}}{\text{Interest}} = 8$$

$$\frac{\text{EBIT}}{1,20,000} = 8$$

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 :

- 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
- Proposed EBIT = Proposed Capital Employed × return on Capital Employed
 = (3,40,00,000 + 40,00,000) × 14.70% = 55,86,000
- 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

$$\text{Debt Equity Ratio} = \frac{1.4\ Cr}{1.4Cr + 2.40Cr} = 36.84\%$$

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

$$\text{Debt Equity Ratio} = \frac{1\ Cr}{1Cr + 2.8Cr} = 26.32\%$$

Debt Equity Ratio has not crossed the limited of 36 % hence, PE ratio in this case will remain at 10 times.

- 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

QUESTION 10 : RTP - SEPT 2024

Company XYZ is unlevered and has a cost of equity of 20 percent and a total market value of Rs. 10,00,00,000. Company ABC is identical to XYZ in all respects except that it uses debt finance in its capital structure with a market value of Rs. 4,00,00,000 and a cost of 10 percent. FIND the market value of equity, weighted average cost of capital and cost of equity of ABC if the tax advantage of debt is 25 percent.

SOLUTION :**Computation of Market Value of Equity of Company ABC**

Total market value of Company ABC

$$V_{ABC} = V_{XYZ} + Bt \dots \dots \dots (i)$$

Where,

V_{ABC} = Market value of leveraged company.

V_{XYZ} = Market value of unleveraged company.

B = Market value of debt.

t = Tax rate.

Now, given

$$V_{xyz} = \text{Rs. } 10,00,00,000$$

$$B = \text{Rs. } 4,00,00,000$$

$$t = 25\%$$

By substituting values in equation (i) above, we have

$$V_{ABC} = \text{Rs. } 10,00,00,000 + \text{Rs. } 4,00,00,000 \times 0.25\%$$

$$= \text{Rs. } 11,00,00,000$$

The Market Value of Equity (s) of Company ABC,

$$= \text{Rs. } 11,00,00,000 - \text{Rs. } 4,00,00,000$$

$$= \text{Rs. } 7,00,00,000$$

Weighted Average Cost of Capital of Company ABC

$$WACC_{ABC} = WACC_{XYZ} [1 - Bt/V_{ABC}]$$

$$= 20\% \left[1 - \frac{4,00,00,000}{11,00,00,000} \times 0.25 \right]$$

$$= 18.18\%$$

Where,

$WACC_{ABC}$ is the weighted average cost of capital of the levered company ABC

$WACC_{XYZ}$ is the weighted average cost of capital of the unlevered company XYZ.

Cost of Equity of company ABC

$$R_{Eabc} = R_{Exyz} + [(1 - t)B/E(R_{Exyz} - R_B)]$$

$$20\% + [(1 - .25) 4,00,00,000/7,00,00,000(.20 - .10)]$$

24.28% approx.

Where,

R_{EABC} is the cost of equity in the levered Company ABC.

R_{Exyz} is the cost of equity in the unlevered Company XYZ.

E is the market value of equity.

B is the market value of debt.

R_B is the cost of debt

QUESTION 11 : PAPER - SEPT 2024

ER Private Limited has a paid-up capital Rs. 2,50,000 consisting of 25,000 Equity shares of Rs. 10 each. The Market price per share is Rs. 24 with PE ratio of 8. The company is planning to purchase a plant which will cost Rs. 5,00,000. This plant is expected to yield earnings before interest and taxes of Rs. 2,00,000 per annum. It has two alternatives to finance the plant:

Alternatives	Equity	Debt
A	100%	-
B	50%	50%

Other information is as under:

- (i) Cost of debt is 12%.
- (ii) Equity shares of face value of Rs. 10 each will be issued at a premium of Rs. 10 per share.
- (iii) PE ratio of Leveraged company will be 7.
- (iv) Tax rate -40%.

Advise which alternative is the most suitable to raise the funds for additional capital, keeping in mind to maximize the benefit to its Shareholders.

SOLUTION :

Calculation of No. of Equity Shares and Existing Earnings before Interest and Taxes

Particulars	Existing	Alternative A: Issue Equity shares only	Alternative B: Issue Equity Shares and 12% Debentures of equal amount
Number of Equity Shares			
- Existing	25,000	25,000	25,000
- Newly issued		25,000	12,500
		$\left(\frac{Rs.5,00,000}{Rs.(10+10)} \right)$	$\left(\frac{Rs.2,50,000}{Rs.(10+10)} \right)$

Total no. of Equity Shares	25,000	50,000	37,500
Calculation of Existing Earnings before Interest and Taxes (EBIT)			
Market Price per share (MPS)	Rs.24		
Price-Earnings Ratio (PE Ratio)	8 times	8 times	7 times
Earning per share (EPS) = MPS/PE Ratio	3		
Earnings after Tax (EAT) = EPS x No. of Equity shares	75,000		
Earning before Tax (EBT) = EAT/0.6 (or EBIT as Interest nil)	1,25,000		

Calculation of EPS and MPS under two financial alternatives

Particulars	Existing	Alternative A:	Alternative B:
Earnings before Interest and Tax:			
- Existing EBIT	1,25,000	1,25,000	1,25,000
- From New Project		2,00,000	2,00,000
	1,25,000	3,25,000	3,25,000
Less: Interest on 12% Debentures	-	-	30,000
Earnings before Tax (EBT)	1,25,000	3,25,000	2,95,000
Less: Tax @ 40%	50,000	1,30,000	1,18,000
Earnings after Tax (EAT)	75,000	1,95,000	1,77,000
EPS = EAT/ No. of Equity Shares	3.00	3.90	4.72
Market Price per share (MPS) = EPS x Price - Earning Ratio	24.00	31.20	33.04

Advise: Alternative B i.e., issue of 12% Debentures is most suitable to maximize the market price per share.

Alternatively, Solution can also be presented in following way:

Calculation of EPS and MPS under two financial alternatives

Particulars	Existing	Alternative A:	Alternative B:
Earnings before Interest and Tax:		2,00,000	2,00,000
- From New Project		2,00,000	2,00,000
Less: Interest on 12% Debentures		-	30,000
Earnings before Tax (EBT)		2,00,000	1,70,000
Less: Tax @ 40%		80,000	68,000
Earnings after Tax (EAT) from new project		1,20,000	1,02,000
Earnings from Existing (PAT)	75,000	75,000	75,000
Total Earnings After Tax (EAT)	75,000	1,95,000	1,77,000
Number of Shares	25,000	50,000	37,500
EPS = EAT/ No. of Equity Shares	3.00	3.90	4.72

Market Price per share (MPS) = EPS x Price-Earning Ratio	24.00	31.20	33.04

Advise: Alternative B i.e., issue of 12% Debentures is most suitable to maximize the market price per share.

QUESTION 12 : RTP - JAN 2025

Ritu Limited in the expansion stage and it provides you the following information:

	Rs.
Profit (EBIT)	5,00,000
Less: Interest on Debenture @ 10%	(1,00,000)
EBT	4,00,000
Less Income Tax @ 30%	(1,20,000)
	2,80,000
No. of Equity Shares (Rs. 10 each)	50,000
Earnings per share (EPS)	5.6
Price /EPS (PE) Ratio	10

The company has reserves and surplus of Rs. 10,00,000 and required Rs. 5,00,000 further for modernisation. Return on Capital Employed (ROCE) is constant. Debt (Debt/ Equity) Ratio lesser than 2 will raise the P/E Ratio to 12. Interest rate on additional debts is 12%. You are required to ASCERTAIN the probable price of the share.

- If the additional capital are raised as debt; and
- If the amount is raised by issuing equity shares at ruling market price.

SOLUTION :

Ascertainment of probable price of shares of Akash limited

Particulars	Plan-I	Plan-II
	If Rs. 5,00,000 is raised as debt (Rs.)	If Rs. 5,00,000 is raised by issuing equity shares (Rs.)
Earnings Before Interest and Tax (EBIT) {20% of new capital i.e. 20% of (Rs. 25,00,000 + Rs. 5,00,000)} (Refer working note1)	6,00,000	6,00,000
Less: Interest on old debentures (10% of Rs. 10,00,000)	(1,00,000)	(1,00,000)
Less: Interest on new debt (12% of Rs. 5,00,000)	(60,000)	--
Earnings Before Tax (EBT)	4,40,000	5,00,000
Less: Tax @ 30%	(1,32,000)	(1,50,000)
Earnings for equity shareholders (EAT)	3,08,000	3,50,000
No. of Equity Shares (refer working note 2)	50,000	58,929

Earnings per Share (EPS)	Rs. 6.16	Rs. 5.94
Price/ Earnings (P/E) Ratio (refer working note 3)	12	10
Probable Price Per Share (PE Ratio × EPS)	Rs. 73.92	Rs. 59.40

Working Notes:**1. Calculation of existing Return of Capital Employed (ROCE):**

	(Rs.)
Equity Share capital (50,000 shares × Rs. 10)	5,00,000
10% Debentures $\left(Rs.1,00,000 \times \frac{100}{10} \right)$	10,00,000
Reserves and Surplus	10,00,000
Total Capital Employed	25,00,000
Earnings before interest and tax (EBIT) (given)	5,00,000
ROCE = $\frac{Rs.50,00,000}{Rs.25,00,000} \times 100$	20%

2. Number of Equity Shares to be issued in Plan-II:

$$= \frac{Rs.5,00,000}{Rs.56} = 8,929 \text{ shares}$$

Thus, after the issue total number of shares = 50,000 + 8,929 = 58,929 shares

3. Debt/Equity Ratio if Rs. 5,00,000 is raised as debt:

$$= \frac{Rs.15,00,000}{Rs.15,00,000} = 1$$

As the debt equity ratio is less than 2 the P/E ratio will be increase to 12 in Plan-I

QUESTION 13 : RTP - MAY 2025

Namra Limited provides you with the following information –

Particulars	Amount (Rs.)
Operating Profit	6,20,000
Less: Interest on Debentures @ 10%	(80,000)
EBT	5,40,000
Less: Tax @ 20%	(1,08,000)
PAT	4,32,000
Less: 14% Preference Dividend	(1,12,000)
Earnings for Equity Share Holders	3,20,000
No of Equity Shares (Rs. 10 Each)	16,000
EPS	20

The Reserves & Surplus of the company is at Rs. 9,00,000 and Namra Limited requires additional funds of Rs. 15,00,000 for modernization and expansion. The current capitalization rate for the equity is 20% and company has a policy to retain 40% of its earnings. The debentures and preference shares are trading at premium of 10% & 25% to its current book value respectively. The fair value of equity shares is calculated by dividing the number of equity shares to the Overall Value of the firm

New equity shares for expansion will be issued 15% discount to the current fair value price. Return on Capital Employed (ROCE) which is based on the total value of the firm, will increase by 10% to its current rate after expansion and modernization. If the capital gearing ratio goes above 2.50 then interest rate on additional debt will increase by 200 basis points and dividend on preference shares would increase by half a percentage.

You are required to ADVISE on the below two financial plan to be selected based on earnings.

- (i) Two-third amount is raised through debenture and remaining by preference share.
- (ii) Issue of equity shares only.

SOLUTION :

Particulars	Additional Funds : Debentures = 15,00,000 x 2/3 Pref = 15,00,000 x 1/3	Additional Funds : 100% Equity
Operating Profit Wn – 1	9,55,776	9,55,776
Less: Interest Exp		
Current	(80,000)	(80,000)
Additional (10,00,000 X 12%) Wn - 2	(1,20,000)	-
EBT	7,55,776	8,75,776
Less: Tax @ 20%	(1,51,155)	(1,75,155)
EAT	6,04,621	7,00,621
Less: Preference Dividend		
Current	(1,12,000)	(1,12,000)
Additional (5,00,000 X 14.5%) Wn - 2	(72,500)	-
Earnings for Equity Shareholders	4,20,121	5,88,621
No of Equity Shares		
Current	16,000	16,000
Additional Wn - 3	-	7,550
EPS	26.26	25.00

WN 1 – Calculation of EBIT after expansion

As given in the question, ROCE is based on the total value of firm, so first step would be to calculate the total value of the firm

Value of Firm = Value of Debt + Value of Pref shares + Value of Equity + Value of R/S

$$\begin{aligned}
 \text{Value of Debt (Vd)} &= \frac{\text{Interest(Rs.)}}{\text{Interest \%}} + 10\% \text{ premium} \\
 &= \frac{80,000}{0.10} + 10\% \text{ premium} \\
 &= \text{Rs.} 8,80,000
 \end{aligned}$$

$$\text{Value of Preference (Vp)} = \frac{\text{Pref Div (Rs.)}}{\text{Pref Div \%}} + 25\% \text{ premium}$$

$$= \frac{1,12,000}{0.14} + 25\% \text{ premium}$$

$$= 10,00,000$$

$$\text{Value of Equity share capital (Ve)} = \frac{\text{Dividend}}{\text{Ke}}$$

$$= \frac{3,20,000 \times 0.6}{0.20}$$

$$= 9,60,000$$

Value of R/S = 9,00,000

$$\text{Therefore, Value of Firm (Vf)} = 8,80,000 + 10,00,000 + 9,60,000 + 9,00,000$$

$$= 37,40,000$$

$$\text{ROCE (Before expansion)} = \frac{\text{EBIT}}{\text{Total value of the firm}}$$

$$= \frac{6,20,000}{37,40,000}$$

$$= 16.58\%$$

$$\text{ROCE (After expansion)} = 16.58 + 1.658 \text{ (i.e } 16.58 + 10\%)$$

$$= 18.24\%$$

$$\text{EBIT (After expansion)} = (37,40,000 + 15,00,000) \times 18.24\%$$

$$= \text{Rs. } 9,55,776$$

WN 2 – Calculation of Interest on additional debt and Preference dividend on additional Preference share capital

Condition – If the capital gearing ratio goes above 2.50, then additional debt raised would be at higher rate of interest and additional Preference shares would also be raised at higher preference dividend rate

Capital gearing ratio when Additional funds are raised through additional debt and preference share capital.

$$\text{Capital gearing ratio} = \frac{8,00,000 + 8,00,000 + 15,00,000}{1,60,000 + 9,00,000}$$

$$\text{Capital gearing ratio} = 2.92$$

Since it is greater than 2.50, Interest on Debt = 10% + 2% (200 basis points) = 12%

Preference Dividend = 14% + 0.5% = 14.5%

WN 3 – Calculation of Additional No of Equity shares when funds are raised through equity

Fair value of equity shares before issuing new equity share

$$= \frac{\text{Total Value of the firm}}{\text{No of existing equity shares}}$$

$$= \frac{37,40,000}{1,60,000}$$

$$= \text{Rs. } 233.75$$

$$\text{Issue Price} = 233.75 - 15\% \text{ Discount} = \text{Rs. } 198.69$$

Therefore, No of New Equity shares to be issued

$$= \frac{\text{Additional Funds to be raised}}{\text{Fair value}}$$

$$= \frac{15,00,000}{198.69}$$

$$= 7549.45 \text{ shares approx. } 7550 \text{ shares}$$

Comment – It is advisable for Namra Limited to raise the additional funds through a mix of debentures and preference as EPS is maximum

QUESTION 14 : RTP - SEPT 2025

ABC Ltd. is planning to raise Rs.50,00,000 for a major expansion project. The firm is evaluating three financing options:

- (i) Equity Financing Only
Issuing new shares at Rs.10 each (Issue price: Rs.10, but flotation cost per share: Rs.0.50).
Existing equity shares: 10,00,000.
Market price per share: Rs.20.
- (ii) Debt Financing Only
Borrow Rs.50,00,000 at 12% interest.
Flotation cost on debt: 2% of the face value.
The lender imposes a debt covenant limiting the interest coverage ratio (EBIT/Interest) to a minimum of 2.5.
- (iii) Mix of Equity and Debt Financing
Raise Rs.25,00,000 through equity (floatation cost: Rs.0.50/share at Rs. 10 issue price).
Raise Rs.25,00,000 through debt at 12% interest (floatation cost: 2%).

Additional Information :

- (i) Project EBIT: Rs.15,00,000 annually.
- (ii) Corporate tax rate: 30%.
- (iii) Existing shares: 10,00,000.
- (iv) Risk-free rate: 6%, Market return: 14%, Equity beta: 1.2.

From the above information:

1. CALCULATE the net proceeds from each financing method (after floatation costs) and determine the number of new shares issued in Option (i) and Option (iii).
2. For debt options, CHECK if the interest coverage ratio complies with the covenant (minimum 2.5).
3. COMPUTE EPS under each option.
4. COMPUTE the WACC under each option, considering the impact of floatation costs on capital raised.

ADVISE which financing option is best from both an EPS and WACC perspective.

SOLUTION :

- (i) **Calculation of Net Proceeds after Floatation Cost and Number of New Shares in Option (i) and (iii)**

Equity Option

Net proceeds per share = Rs. 10 – Rs. 0.50 = Rs.9.50

Number of shares issued = Rs. 50,00,000 / Rs. 9.50 = **5,26,316 shares**

Debt Option

Flotation cost = 2% of Rs. 50,00,000 = Rs.1,00,000

Net proceeds = Rs. 50,00,000 – Rs.1,00,000 = Rs.**49,00,000**

But project requires Rs. 50,00,000.

So gross borrowing = Rs.50,00,000 / (1 – 0.02) = Rs.**51,02,041**

Interest = 12% × Rs.51,02,041 = Rs.**6,12,245**

Mix Option (Rs.25 lakh Equity, Rs.25 lakh Debt)

Equity

Net proceeds/share = Rs. 9.50

Shares issued = Rs. 25,00,000 / Rs. 9.50 = **2,63,158 shares**

Debt

Net debt proceeds = Rs. 25,00,000.

Gross borrowing = Rs.25,00,000 / (1 – 0.02) = Rs.25,51,020

Interest = 12% × Rs.25,51,020 = Rs.**3,06,122**

(ii) Calculation of Interest Coverage Ratio (ICR)

ICR = EBIT / Interest

Debt Option:

EBIT = Rs. 15,00,000

Interest = Rs. 6,12,245

ICR = Rs. 15,00,000 / Rs. 6,12,245 ≈ **2.45 (Fails covenant)**

Mix of Equity and Debt Option

Interest = Rs. 3,06,122

ICR = Rs. 15,00,000 / Rs. 3,06,122 ≈ **4.90 (Passes covenant)**

(iii) Calculation of Earnings Per Share (EPS)

EPS =
$$\frac{(\text{EBIT}-\text{Interest})(1-\text{Tax})}{\text{Total Shares}}$$

Equity Option

Interest = Rs. 0

Net Income = Rs. 15,00,000 × (1 – 0.30) = Rs. 10,50,000

Total Shares = 10,00,000 + 5,26,316 = **15,26,316**

EPS = Rs. 10,50,000 / 15,26,316 = Rs. **0.688**

Debt Option (Fails covenant)

Interest = Rs. 6,12,245

Net Income = (Rs. 15,00,000 – Rs. 6,12,245) × (1 – 0.30)

= Rs. 6,21,428.5

Total Shares = 10,00,000

EPS = Rs. 6,21,428.5 / 10,00,000

= Rs. **0.621** (But violates ICR)

Mix Option

Interest = Rs. 3,06,122

Net Income = (Rs. 15,00,000 – Rs. 3,06,122) × 0.70 = Rs. 8,35,714.6

Total Shares = 10,00,000 + 2,63,158 = **12,63,158**

EPS = Rs. 8,35,714.6 / 12,63,158 ≈ Rs. **0.662**

(iv) Calculation of WACC

Cost of Equity (Using CAPM)

Cost of Equity = $R_f + \beta(R_m - R_f)$

$$= 6\% + 1.2 \times (14\% - 6\%) = 6\% + 9.6\% = 15.6\%$$

$$\text{Now, WACC} = (EV \times K_e) + (DV \times K_d \times (1 - t))$$

Equity Option

$$E = \text{Rs. } 50,00,000$$

$$D = \text{Rs. } 0$$

$$\text{WACC} = 15.6\%$$

Debt Option

$$E = \text{Rs. } 0$$

$$D = \text{Rs. } 51,02,041$$

$$K_d = 12\%$$

$$\text{After-tax cost of debt} = 12\% \times (1 - 0.30) = 8.4\%$$

$$\text{WACC} = 8.4\% \text{ (Lowest WACC but fails covenant)}$$

Mix Option

$$E = \text{Rs. } 25,00,000, D = \text{Rs. } 25,51,020$$

$$\text{Total Value} = \text{Rs. } 50,51,020$$

$$K_e = 15.6\%, K_d \text{ (after tax)} = 8.4\%$$

$$\text{WACC} = (\text{Weight of } K_e \times \text{Cost of Equity}) + (\text{Weight of } K_d \times \text{Cost of Debt})$$

$$= (0.495 \times 0.156) + (0.505 \times 0.084)$$

$$= 0.0772 + 0.0424 = 0.1196 \text{ or } 11.96\%$$

Conclusion & Recommendation

Option	EPS	WACC	Covenant Compliant
Equity	Rs. 0.688	15.60%	Not Applicable
Debt	Rs. 0.621	8.40%	No (ICR < 2.5)
Mix	Rs. 0.662	11.96%	Yes

Hence, the recommended option is Mixed Financing as it complies with the debt covenant, has higher EPS than Debt Option, and lower WACC than Equity Option.

QUESTION 15 : PAPER - SEPT 2025

AVS Limited is planning to diversify its cotton manufacturing business. The Chief Financial Officer (CFO) intends to raise fund of Rs. 22,00,000 for this project. The current estimates of Earnings Before Interest and Taxes (EBIT) from the new project are Rs. 5,00,000 per annum. The company's share is currently selling at Rs. 120 and is expected to decline to Rs. 110, in case the funds are borrowed more than Rs. 10,00,000. It is stated that the cost of debt will be 14% up to Rs. 8,00,000, 16% for additional amount of Rs. 2,00,000 above Rs. 8,00,000 and 18% for additional amount above Rs. 10,00,000. The tax rate applicable to the company is 30%. the following options are in consideration of the company.

Option	Debt	Equity
I	60%	40%
II	50%	50%
III	40%	60%

Considering the objective of maximising Earning Per Share (EPS), which option of financing should the company choose?

SOLUTION :

Particulars	Options		
	Option-I: 60% Debt Rs.	Option-II: 50% Debt Rs.	Option-III: 40% Debt Rs.
Debt	13,20,000	11,00,000	8,80,000
Equity	8,80,000	11,00,000	13,20,000
EBIT	5,00,000	5,00,000	5,00,000
Interest on Debts:			
- on debt upto Rs. 8 lacs @14%	(1,12,000)	(1,12,000)	(1,12,000)
- on debt above 8 lacs and upto 10 lacs @ 16%	(32,000)	(32,000)	(12,800)
- on debt above 10 lacs @ 18%	(57,600)	(18,000)	---
Profit before taxes	2,98,400	3,38,000	3,75,200
Taxes @ 40%	(89,520)	(1,01,400)	(1,12,560)
Profit after taxes	2,08,880	2,36,600	2,62,640
Number of shares	8,000	10,000	11,000
Earnings per share	26.11	23.66	23.88

Since Option 1 i.e 60% debt provide the maximum EPS, company should choose Option 1 (60% debt and 40% equity) for financing.

QUESTION 16 : RTP - JAN 2026

J Ltd. is an all equity financed company with a market value of Rs. 25,00,000 and cost of equity (K_e) 21%. The company wants to buyback equity shares worth Rs. 5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to calculate:

- Market value of J Ltd.
- Cost of Equity (K_e)
- Weighted average cost of capital (using market weights) and comment on it.

SOLUTION :

Market Value of Equity = Rs. 25,00,000

K_e = 21%

Net income (NI) for equity - holders

$$\frac{\text{Net income (NI) for equity - holders}}{K_e} = \text{Market Value of Equity}$$

Net income (NI) for equity - holders

$$\frac{\text{Net income (NI) for equity - holders}}{0.21} = 25,00,000$$

Net income for equity holders = 5,25,000

EBIT = 5,25,000/0.7 = 7,50,000

	All Equity	Debt and Equity
EBIT	7,50,000	7,50,000
Interest to debt-holders	-	(75,000)
EBT	7,50,000	6,75,000
Taxes (30%)	(2,25,000)	(2,02,500)
Income available to equity shareholders	5,25,000	4,72,500
Income to debt holders plus income available to shareholders	5,25,000	5,47,500

Present value of tax-shield benefits = Rs. 5,00,000 × 0.30 = Rs. 1,50,000

(i) Value of Restructured firm

= Rs. 25,00,000 + Rs. 1,50,000 = Rs. 26,50,000

(ii) Cost of Equity (K_e)

Total Value = Rs. 26,50,000

Less: Value of Debt = Rs. 5,00,000

Value of Equity = Rs. 21,50,000

$$K_e = \frac{4,72,500}{21,50,000} = 0.219 = 21.98\%$$

(iii) WACC (on market value weight)

Cost of Debt (after tax) = 15% (1 - 0.3) = 0.15 (0.70) = 0.105 = 10.5%

Components of Costs	Amount	Cost of Capital (%)	Weight	WACC (%)
Equity	21,50,000	21.98	0.81	17.80
Debt	5,00,000	10.50	0.19	2.00
	26,50,000			19.80

Comment: At present the company is all equity financed. So, K_e = K_o i.e. 21%. However, after restructuring, the K_o would be reduced to 19.80% and K_e would increase from 21% to 21.98%.

QUESTION 17 : RTP - MAY 2026

The following data relate to two companies belonging to the same risk 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 Capitalization Rate	?	18

Required :

- DETERMINE the total market value, equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.
- 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)]

$$\begin{aligned}\text{Total Value of Unlevered Firm (V}_u\text{)} &= [\text{NOI}/k_e] \\ &= 18,00,000/0.18 \\ &= \text{Rs. } 1,00,00,000\end{aligned}$$

$$K_e \text{ of Unlevered Firm (given)} = 0.18$$

$$\begin{aligned}K_o \text{ of Unlevered Firm (Same as above)} &= k_e \text{ (as there is no debt)} \\ &= 0.18\end{aligned}$$

Market Value of 'A Ltd' [Levered Firm (l)]

$$\begin{aligned}\text{Total Value of Levered Firm (V}_l\text{)} &= V_u + (\text{Debt} \times \text{Nil}) \\ &= \text{Rs. } 1,00,00,000 + (54,00,000 \times \text{nil}) \\ &= \text{Rs. } 1,00,00,000\end{aligned}$$

**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 (k_o)	0.18	0.18
E	Total Value of Firm ($V = \text{NOI}/k_o$)	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 [$k_e = \text{NI}/S$]	0.2504	0.18
I	Weighted Average Cost of Capital [WACC] (k_o)	0.18	0.18

(b) Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis Approach

Market Value of 'B Ltd' [Unlevered(u)]

$$\begin{aligned}\text{Total Value of unlevered Firm (V}_u\text{)} &= [\text{NOI} (1 - t)/k_e] \\ &= 18,00,000(1 - 0.40) / 0.18 \\ &= \text{Rs. } 60,00,000\end{aligned}$$

$$K_e \text{ of unlevered Firm (given)} = 0.18$$

$$\begin{aligned}K_o \text{ of unlevered Firm (Same as above)} &= k_e \text{ as there is no debt} \\ &= 0.18\end{aligned}$$

Market Value of 'A Ltd' [Levered Firm (l)]

$$\begin{aligned}\text{Total Value of Levered Firm (V}_l\text{)} &= V_u + (\text{Debt} \times \text{Tax}) \\ &= \text{Rs. } 60,00,000 + (54,00,000 \times 0.40) \\ &= \text{Rs. } 81,60,000\end{aligned}$$

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

$$= 18\% \text{ (i.e. } K_e = K_o\text{)}$$

**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 [$k_e = NI/S$]	0.2504
Weighted Average Cost of Capital (k_o)*	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

* $K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$

WACC = 13.23%

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 companies 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% $\frac{\text{Rs.6,00,000}(1 - 0.5)}{0.15}$	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**

$$\frac{\text{Net income (NI) for equity - holders}}{K_e} = \text{Market Value of Equity}$$

$$\frac{\text{Net income (NI) for equity holders}}{0.20} = \text{Rs. 1,140 lakhs}$$

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

$$\begin{aligned} K_e &= (\text{Net Income to equity holders} / \text{Equity Value}) \times 100 \\ &= (207 \text{ lakhs} / 1200 \text{ lakhs} - 200 \text{ lakhs}) \times 100 \\ &= (207 / 1000) \times 100 \\ &= 20.7\% \end{aligned}$$

(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.

$$\text{Cost of Capital } (K_0) = K_{eu}(1 - tL)$$

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

$$K_0 = 0.2 \times \left(\frac{\text{Rs.200lakh}}{\text{Rs.1,200lakh}} \times 0.3 \right)$$

So, Cost of Capital = 0.19 or 19%

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d) \frac{\text{Debt}(1 - t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$K_e = 0.20 + \left(0.20 - 0.15 \times \frac{\text{Rs.200lakh} \times 0.7}{\text{Rs.1,000lakh}} \right)$$

$$K_e = 0.20 + 0.007 = 0.207 \text{ or } 20.7\%$$

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 capitalization 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 (V_u) = $[NOI/k_e] = 18,00,000/0.18 = \text{Rs. } 1,00,00,000$

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 (l)]

Total Value of Levered Firm (V_L) = $V_u + (\text{Debt} \times \text{Nil}) = \text{Rs. } 1,00,00,000 + (54,00,000 \times \text{nil})$
 $= \text{Rs. } 1,00,00,000$

**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 (k_o)	0.18	0.18
E.	Total Value of Firm ($V = NOI/k_o$)	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 [$k_e = NI/S$]	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 (V_u) = $[NOI (1 - t)/k_e] = 18,00,000 (1 - 0.40) / 0.18$
 $= \text{Rs. } 60,00,000$

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 (l)]

Total Value of Levered Firm (V_L) = $V_u + (\text{Debt} \times \text{Tax})$
 $= \text{Rs. } 60,00,000 + (54,00,000 \times 0.4)$

= Rs.81,60,000

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

= 18% (i.e. $K_e = K_o$)

**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 [$k_e = NI/S$]	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

* $K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$

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)

$$V_u = \frac{EBIT(1-t)}{k_e} = \frac{Rs.25,00,000(1-0.30)}{20\%} = \frac{Rs.17,50,000}{20\%} = Rs. 87,50,000$$

Market Value of 8B Ltd.9 (Levered)

$$V_g = V_u + TB$$

$$= Rs. 87,50,000 + (Rs.1,00,00,000 \times 0.30)$$

$$= Rs. 87,50,000 + Rs.30,00,000 = Rs.1,17,50,000$$

ii. Computation of Weighted Average Cost of Capital (WACC)

WACC of 'A Ltd.' = 20% (i.e. $K_e = K_o$)

WACC of 'B Ltd.'

	B Ltd. (Rs.)
EBIT	25,00,000
Interest to Debt holders	(12,00,000)
EBT	13,00,000
Taxes @ 30%	(3,90,000)
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 (K_e) = 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

$$*K_d = 12\% (1 - 0.3) = 12\% \times 0.7 = 8.4\%$$

$$WACC = 14.90\%$$

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 (K_e) 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:

- Market value of A&R Ltd.
- Cost of Equity (K_e)
- 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

$$\text{Market value of equity} = \frac{\text{Net Income}}{(\text{NI}) K_E}$$

In the question, market value of equity is Rs. 25,000 lakhs and cost of equity (K_E) is 18%. The Net Income

(NI) is calculated as follows:

$$\frac{\text{Net Income (NI) for equity}}{\text{holders } K_E} = \text{Market Value of Equity}$$

$$= \frac{\text{Net Income (NI) for equity}}{\text{holders } 0.8} = 25,000 \text{ lakh}$$

holders 0.18

Net income for equity holders = 4,500 lakh

Net Income (NI) is after tax income, the before tax income would be

$$\text{EBT} = \frac{45 \text{ Lakh}}{(1 - 0.35)} = 6,923.07 \text{ lakh}$$

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 (V_g)

= Value of an unlevered company (V_u) + Tax benefit (TB)

= Rs. 25,000 lakhs + (Rs. 5,000 lakhs $\times$ 35%)

= Rs. 25,000 + Rs. 1,750 = Rs. 26,750

(ii) Cost of Equity (K_E)

Total Value = Rs. 26,750 lakh

Less: Value of Debt = Rs. 5,000 lakh

Value of Equity = Rs. 21,750

$$K_E = \frac{4.175 \text{ Lakh}}{21,750 \text{ Lakh}} = 0.1919 = 19.19\%$$

(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

$$\text{Cost of Debenture (Kd)} = \frac{\text{Rs.}500(1 - 0.35) + \frac{(5,500 - 5,000)}{5}}{\frac{(5,500 + 5,000)}{2}}$$

$$\frac{\text{Rs.}325 + 100}{5,525} = 0.081 \text{ or } 8.1\%$$

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 it differ from that of A Ltd

SOLUTION :

(a) Value of A Ltd = $\frac{NOI}{K_e} = \frac{\text{Rs. } 4,50,000}{18\%} = \text{Rs. } 25,00,000$

(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 = $\frac{\text{Rs. } 3,30,000}{\text{Rs. } 10,00,000} = 33\%$

(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

$$\text{Implied required rate of return on equity} = \frac{\text{Rs. 4,10,000}}{\text{Rs. 20,00,000}} = 20.5\%$$

- (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 $K_e = 12.5\%$

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
K_e	12.50%	12.50%
Value of Equity (S) (Earnings available to Equity shareholders/ K_e)	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:

- Market value of the company
- Overall Cost of capital
- Cost of equity

SOLUTION :

Workings :

$$\text{Market Value of Equity} = \frac{(\text{Net income (NI) for equity holders})}{k_e}$$

$$\text{Rs.1,750 lakhs} = \frac{(\text{Net income (NI) for equity holders})}{0.20}$$

$$\text{Net Income to equity holders/EAT} = \text{Rs. 350 lakhs}$$

$$\text{Therefore, EBIT} = \frac{EAT}{(1-t)} = \frac{\text{Rs.350 Lakhs}}{(1-0.3)} = \text{Rs.500 Lakhs}$$

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 - 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 - Rs. 275 lakhs = Rs. 1,557.50 lakhs

Cost of Equity (K_e) = (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 (K_d) = $I(1 - t) = 15(1 - 0.3) = 10.50\%$

Components	Amount (Rs. In lakhs)	Cost of Capital %	Weight	WACC (K_o) %
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or K_o 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 (K_o) = $K_{eu} [1 + (t \times L)]$ Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate $L = \frac{Debt}{Debt + Equity}$

So, $K_o = 0.20 \left[1 - \left(0.3 \times \frac{Rs.275Lakhs}{Rs.1,832.5Lakhs} \right) \right] = 0.191$ 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

$$\text{So, } K_e = 0.20 + \left((0.20 - 0.15) \times \frac{\text{Rs.}275\text{Lakhs}(1 - 0.30)}{\text{Rs.}1,557.5\text{Lakhs}} \right) = 0.2062 \text{ or } 20.62\%$$

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, $K_e = \text{NI}/V$	10.00%	10.70%

- 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%
- 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.) $(\text{NOI} / K_o) \times 100$	55005.5	55005.5

$$\frac{5,000}{9.09} \times 100$$

$$\frac{5,000}{9.09} \times 100$$

(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) = $(1800/30000) \times 100 = 6\%$

Cost of Equity of Firm B (Levered) = $K_o + (K_o - K_d) \times (\text{Debt} / \text{Equity})$

$$= 9.09 + (9.09 - 6) \times (30000/25005.5)$$

$$= 9.09 + 3.09 \times 1.2 = 9.09 + 3.71 = \mathbf{12.80\%}$$

OR

$$\begin{aligned}\text{Cost of Equity of Firm B (Levered)} &= \left(\frac{NI}{\text{Value of Equity}} \right) \times 100 \\ &= \left(\frac{3200}{25005.5} \right) \times 100 = 12.8\%\end{aligned}$$

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 $K_e = 15\%$

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 $K_e = 20\%$ 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
K_e	15%	15%
Value of Equity (S) (Earnings available to Equity shareholders/ K_e)	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 × 20%)	2,56,000
Borrow money (4,00,000 × 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 × 3,36,000/16,00,000)	50,400
Less: Interest on loan (80,000 × 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 $K_e = 20\%$	

(i) **Valuation of firms**

Particulars	Dumbo Ltd (Rs.)	Jumbo Ltd (Rs.)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% x Rs. 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
K_e	20%	15%
Value of Equity (S) (Earnings available to Equity shareholders/ K_e)	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 $K_e = 12.5\%$

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) (Earnings available to Equity shareholders / K_e)	2,40,000	3,60,000
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 × 20%)	48,000
Borrow money (Rs. 1,50,000 × 20%)	<u>30,000</u>
Buy shares in Unlevered company	<u>78,000</u>

(iii) Change in Return

	Rs
Income from shares in Unlevered company (Rs. 78,000 × 12.5%)	9,750
Less: Interest on loan (Rs. 30,000 × 10%)	<u>3,000</u>
Net Income from unlevered firm	6,750
Less: Income from Levered firm (Rs. 48,000 × 12.5%)	<u>6,000</u>
Incremental Income due to arbitrage	<u>750</u>

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.

SOLUTION :

1. Valuation of firms

Particulars	Levered Firm (Rs.)	Unlevered Firm (Rs.)
EBIT	25,000	25,000
Less: Interest on debt ($8\% \times \text{Rs. } 75,000$)	6,000	Nil
Earnings available to Equity shareholders K_e	19,000	25,000
Value of Equity (S)	12.50%	12.50%
(Earnings available to Equity shareholders/ K_e)	1,52,000	2,00,000
Debt (D)	75,000	Nil
Value of Firm (V) = S + D	2,27,000	2,00,000

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.

2. Investment & Borrowings Rs.

Sell shares in Levered company ($\text{Rs. } 1,52,000 \times 12\%$)	18,240
Borrow money ($\text{Rs. } 75,000 \times 12\%$)	9,000
Buy shares in Unlevered company	27,240

3. Change in Return Rs.

Income from shares in Unlevered company ($\text{Rs. } 27,240 \times 12.5\%$)	3,405
Less: Interest on loan ($\text{Rs. } 9,000 \times 8\%$)	720
Net Income from unlevered firm	2,685
Less: Income from Levered firm ($\text{Rs. } 18,240 \times 12.5\%$)	2,280
Incremental Income due to arbitrage	405

Solution can also be done in the following way:

Valuation of firms

Particulars	Levered Firm (Rs.)	Unlevered Firm (Rs.)
EBIT	25,000	25,000
Less: Interest on debt ($8\% \times \text{Rs. } 75,000$)	6,000	Nil
Earnings available to Equity shareholders K_e	19,000	25,000
Value of Equity (S)	12.50%	12.50%
(Earnings available to Equity shareholders/ K_e)	1,52,000	2,00,000

Debt (D)	75,000	Nil
Value of Firm (V) = S + D	2,27,000	2,00,000

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.

Arbitrage Process:

If investor have 12% shares of levered company, value of investment in equity shares is 12% of Rs. 1,52,000 i.e. Rs. 18,240 and return will be 12% of Rs.19,000 = Rs. 2,280.

Alternate Strategy will be:

Sell 12% shares of levered firm for Rs. 18,240 and borrow 12% of levered firm's debt i.e. Rs. 9,000 (12% of Rs. 75,000) and invest the money i.e. 12% in unlevered firm's stock:
Total resources /Money investor have = Rs. 18,240 + Rs. 9,000 = Rs. 27,240 and investor invest 12% of Rs. 2,00,000 = Rs. 24,000

Surplus cash available with investor is = Rs. 27,240 – Rs. 24,000 = Rs. 3,240

Investor return = 12% EBIT of unlevered firm – Interest to be paid on borrowed funds
i.e. = 12% of Rs. 25,000 – 8% of Rs. 9,000 = Rs. 3,000 – Rs. 720 = Rs. 2,280

Now, return remains the same i.e. Rs. 2,280 which investor is getting from levered company before investing in unlevered company but still have Rs. 3,240 excess money available with investor. Hence, investor is better off by doing arbitrage.

QUESTION 14 : RTP – SEPT 2024

The following data relate to two companies belonging to the same risk 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 Capitalization Rate	-	18

Required :

- DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.
- 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 (V_u) = $[NOI/k_e] = 18,00,000/.18 = \text{Rs. } 1,00,00,000$

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 (l)]

Total Value of Levered Firm (V_L) = $V_u + (\text{Debt} \times \text{Nil}) = \text{Rs. } 1,00,00,000 + (54,00,000 \times \text{nil})$
= 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 (k_o)	0.18	0.18
E	Total Value of Firm ($V = \text{NOI}/k_o$)	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 [$k_e = \text{NI}/S$]	0.2504	0.18
I	Weighted Average Cost of Capital [WACC] (k_o)	0.18	0.18

(b) Assuming 40% taxes as per MM Approach**Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis Approach**Market Value of 'B Ltd' [Unlevered(u)]

$$\text{Total Value of unlevered Firm } (V_u) = [\text{NOI}(1 - t)/k_e] = 18,00,000 (1 - 0.40) / 0.18$$

$$= \text{Rs. } 60,00,000$$

$$K_e \text{ of unlevered Firm (given)} = 0.18$$

$$K_o \text{ of unlevered Firm (Same as above} = k_e \text{ as there is no debt)} = 0.18$$

Market Value of 'A Ltd' [Levered Firm (l)]

$$\text{Total Value of Levered Firm } (V_L) = V_u + (\text{Debt} \times \text{Tax})$$

$$= \text{Rs. } 60,00,000 + (54,00,000 \times 0.40)$$

$$= \text{Rs. } 81,60,000$$

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

$$= 18\% \text{ (i.e. } K_e = K_o)$$

**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 [$k_e = \text{NI}/S$]	0.2504
Weighted Average Cost of Capital (k_o)*	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

$$*K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$$

$$WACC = 13.23\%$$

QUESTION 15 : PAPER – MAY 2025

Z Ltd. is an unlevered company. It wants to repurchase its equity shares of Rs. 300 lakhs by issue of 12% debentures of same amount. Current market value of Z Ltd. is Rs. 1,400 lakhs. Its cost of capital is 18%. The company will maintain same level of EBIT in future years. Dividend pay-out ratio is 100%. Company pays tax at a rate of 30%.

As per Modigliani and Miller approach, due to such change in capital structure, what will be impact on the following?

- Market Value of Z Ltd.
- Overall cost of capital
- Cost of equity

SOLUTION :

$$\text{Market Value of Equity} = \frac{\text{Net income (NI) for equity holders}}{K_e}$$

$$\text{Rs.1,400 lakhs} = \frac{\text{Net income (NI) for equity holders}}{0.18}$$

$$\text{Net Income to equity holders/EAT} = \text{Rs.252 lakhs}$$

$$\text{Therefore, EBIT} = \frac{\text{EAT}}{(1 - t)} = \frac{252 \text{ lakhs}}{(1 - 0.3)} = \text{Rs.360 lakhs}$$

Income Statement

	All Equity (Rs. In lakhs)	Equity & Debt (Rs. In lakhs)
EBIT (as calculated above)	360	360
Interest on Rs. 300 lakhs @ 12%	-	36
EBT	360	324
Tax @ 30%	108	97.2
Income available to equity holders	252	226.8

(i) Market value of Z Ltd

$$\begin{aligned} \text{Market value of levered firm} &= \text{Value of unlevered firm} + \text{Tax Advantage} \\ &= \text{Rs. 1,400 lakhs} + (\text{Rs. 300 lakhs} \times 0.3) \\ &= \text{Rs. 1,490 lakhs} \end{aligned}$$

$$\begin{aligned} \text{Change in market value of the company} &= 1,490 \text{ lakhs} - 1,400 \text{ lakhs} \\ &= \text{Rs. 90 lakhs} \end{aligned}$$

The impact is that the market value of the company has increased by Rs. 90 lakhs due to replacement of equity with debt.

(ii) Overall Cost of Capital

$$\text{Market Value of Equity} = \text{Market value of levered firm} - \text{Equity repurchased}$$

$$\begin{aligned}
 &= \text{Rs. 1,490 lakhs} - \text{Rs. 300 lakhs} = \text{Rs. 1,190 lakhs} \\
 \text{Cost of Equity (K}_e\text{)} &= \frac{\text{Net income to equity holders}}{\text{Market value of equity}} \times 100 \\
 &= \frac{\text{Rs.226.8 lakhs}}{\text{Rs.1190 lakhs}} \times 100 = 19.06\% \text{ (approx.)} \\
 \text{Cost of debt (K}_d\text{)} &= I(1 - t) = 12(1 - 0.3) = 8.4\%
 \end{aligned}$$

Components	Amount (Rs. In lakhs)	Cost of Capital %	Weight	WACC (K _o) %
Equity	1,190	19.06	0.80(approx.)	15.25
Debt	300	8.4	0.20(approx.)	1.68
	1,490		1	16.93

(Note: If we take the weight of Equity as 0.7986 and weight of Debt as 0.2013 then WACC will be 16.91%).

Impact on Market value and Overall cost of capital of Z Ltd.

Particulars	Before restructure	After restructure	Impact
Market value of company	Rs. 1,400 lakhs	Rs. 1,490 Lakhs	Increase due to import of debt
Cost of equity	18%	19.06%	Increase
Overall cost of capital	18%	16.93%	Decrease

So, the impact is that the Overall Cost of Capital or K_o has fallen by 1.07% (18% - 16.93%) 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 1.06% (19.06% - 18%) 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,

$$\text{Cost of Capital (K}_o\text{)} = K_{eu} [1 - (t \times L)]$$

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

$$\text{So, K}_o = 0.18 \left[1 - (0.3 \times \frac{\text{Rs.300 lakhs}}{\text{Rs.1490 lakhs}}) \right] = 0.1691 \text{ or } 16.91\% \text{ (approx..)}$$

$$\text{Cost of Equity (K}_e\text{)} = K_{eu} + (K_{eu} - K_d) \frac{\text{Debt}(1-t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$\begin{aligned} \text{So, } K_e &= 0.18 + \left((0.18 - 0.12) \times \frac{\text{Rs.}300 \text{ lakhs } (1 - 0.3)}{\text{Rs.}1190 \text{ lakhs}} \right) \\ &= 0.1906 \text{ or } 19.06\% \end{aligned}$$

QUESTION 16 : PAPER – MAY 2026

MM Hypothesis of dividend policy is based on certain assumptions. What are those assumptions without which the hypothesis cannot hold? Explain briefly.

SOLUTION :

MM hypothesis is based on the following assumptions:

- **Perfect capital markets:** The firm operates in a market in which all investors are rational and information is freely available to all.
- **No taxes:** There are no taxes or no tax discrimination between dividend income and capital appreciation (capital gain). It means there is no difference in taxation of dividend income or capital gain. This assumption is necessary for the universal applicability of the theory, since the tax rates may be different in different countries.
- **Fixed investment policy:** It is necessary to assume that all investment should be financed through equity only, since implication after using debt as a source of finance may be difficult to understand. Further, the impact will be different in different cases.
- **No floatation or transaction cost:** Similarly, these costs may differ from country to country or market to market.
- **Risk of uncertainty does not exist.** Investors are able to forecast future prices and dividend with certainty and one discount rate is appropriate for all securities and all time periods.

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:

- Discounted payback period
- Profitability index
- 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 A's 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 = $\frac{\text{sum of discounted cash in flows}}{\text{initial cash only}}$

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:

$$\begin{aligned} (-) \text{ Rs. } 270 \text{ lakhs} + (\text{Rs. } 42 \text{ lakhs} / 0.14) &= (-) \text{ Rs. } 270 \text{ lakhs} + \text{Rs. } 300 \text{ lakhs} \\ &= \text{Rs. } 30 \end{aligned}$$

Issue costs = Rs. 10 lakhs

$$\begin{aligned} \text{Thus, the amount to be raised} &= \text{Rs. } 270 \text{ lakhs} + \text{Rs. } 10 \text{ lakhs} \\ &= \text{Rs. } 280 \text{ lakhs} \end{aligned}$$

$$\begin{aligned} \text{Annual tax relief on interest payment} &= \text{Rs. } 280 \times 0.1 \times 0.3 \\ &= \text{Rs. } 8.4 \text{ lakhs in perpetuity} \end{aligned}$$

$$\begin{aligned} \text{The value of tax relief in perpetuity} &= \text{Rs. } 8.4 \text{ lakhs} / 0.1 \\ &= \text{Rs. } 84 \text{ lakhs} \end{aligned}$$

$$\begin{aligned} \text{Therefore, APV} &= \text{Base case PV} - \text{Issue Costs} + \text{PV of Tax Relief on debt interest} \\ &= \text{Rs. } 30 \text{ lakhs} - \text{Rs. } 10 \text{ lakhs} + 84 \text{ lakhs} = \text{Rs. } 104 \text{ lakhs} \end{aligned}$$

(ii) Calculation of Adjusted Discount Rate (ADR)

Annual Income / Savings required to allow an NPV to zero

Let the annual income be x.

$$(-) \text{ Rs. } 280 \text{ lakhs} \times (\text{Annual Income} / 0.14) = (-) \text{ Rs. } 104 \text{ lakhs}$$

$$\text{Annual Income} / 0.14 = (-) \text{ Rs. } 104 + \text{Rs. } 280 \text{ lakhs}$$

$$\text{Therefore, Annual income} = \text{Rs. } 176 \times 0.14 = \text{Rs. } 24.64 \text{ lakhs}$$

$$\begin{aligned} \text{Adjusted discount rate} &= (\text{Rs. } 24.64 \text{ lakhs} / \text{Rs. } 280 \text{ lakhs}) \times 100 \\ &= 8.8\% \end{aligned}$$

(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 $\times$ (1 – Tc) + Tc $\times$ Depreciation (Tc = Corporate tax i.e. 30%)
= Rs. 24,00,000 $\times$ (1 – 0.3) + (0.3 $\times$ 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 $\times$ PVIF 12%, 5 years) + (Rs. 12,00,000 $\times$ 0.567)
= (Rs. 20,40,000 $\times$ 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 company's 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:

- ESTIMATE net present value of the replacement decision.
- CALCULATE the internal rate of return of the replacement decision.
- 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 :

- Net Cash Outlay of New Machine
 Purchase Price Rs. 60,00,000
 Less: Exchange value of old machine
 [2,50,000 - 0.4(2,50,000 - 30)] 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. relevant. 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

$$= \{100,000(200 - 148) - 80,000(200 - 173)\} \times (1 - 0.40)$$

$$= \{52,00,000 - 21,60,000\} \times 0.60$$

$$= \text{Rs. } 18,24,000$$

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 - 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 - 335,000)	-	-	-	-	-	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:

$$\text{Profit before depreciation and tax} = \text{Rs. } 1,00,000 (200 - 148) - 80,000 (200 - 173)$$

$$= \text{Rs. } 52,00,000 - 21,60,000$$

$$= \text{Rs. } 30,40,000$$

$$\text{So profit after depreciation and tax is Rs. } (30,40,000 - 11,50,000) \times (1 - .40)$$

$$= \text{Rs. } 11,34,000$$

So profit before depreciation and after tax is :

$$\text{Rs. } 11,34,000 + \text{Rs. } 11,50,000 (\text{Depreciation added back}) = \text{Rs. } 22,84,000$$

(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					

$$RS. = 20\% + 10\% \times \frac{1066.94}{1296.82} = 28.23\%$$

(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

- Selling price per unit Rs 100
- Variable cost is 40% of sales
- Fixed cost P.a Rs 3,00,000
- 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

- Income Tax is 25%
- Straight line method of depreciation is permissible for tax purpose
- Cost of capital is 10%
- 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	0.513	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)	<u>72,00,000</u>	<u>96,00,000</u>	<u>1,68,00,000</u>	<u>1,44,00,000</u>
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	<u>30,00,000</u>	<u>30,00,000</u>	<u>30,00,000</u>	<u>30,00,000</u>
Profit /(loss)	(38,00,000)	11,00,000	98,00,000	79,00,000
Less: Tax @ 25%	<u>NIL</u>	<u>2,75,000</u>	<u>24,50,000</u>	<u>19,75,000</u>
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:

- Calculate the payback period of each of three project.
- If the cut-off period is two years, then which projects should be accepted?
- Projects with positive NPV's if the opportunity cost of capital is 10 per cent
- "Payback gives too much weight to cash flows that occur after the cut-off date". True or false?
- "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 (1/10 th 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 Company's 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

$$(PVA_{F_5}, r) = 0 \text{ or } PVA_{F_5} r (\text{Cumulative factor}) = \frac{\text{Rs.72,00,000}}{\text{Rs.23,24,000}} = 3.09$$

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)

$$\begin{aligned}
 RS. &= LR + \frac{NPV \text{ at LR}}{NPV \text{ at LR} - NPV \text{ at HR}} \times (HR - LR) \\
 &= 15\% + \frac{5,85,400}{5,58,400 - (88,560)} \times (19\% - 15\%) \\
 &= 15\% + 3.47 = 18.47\%
 \end{aligned}$$

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)

$$\begin{aligned} \text{IRR} &= 16\% + \frac{50.71 \times 4}{50.71 - (-26.84)} \\ &= 16\% + \frac{2.03}{77.55} = 16\% + 2.62\% = 18.62\% \end{aligned}$$

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 1 st year in addition of annual fixed cost	Rs. 20,000
Maintenance Expenses in 5 th 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

$$\text{Depreciation on Machine – A} = \frac{\text{Rs. } 8,00,000}{4} = \text{Rs. } 2,00,000$$

$$\text{Depreciation on Machine – B} = \frac{\text{Rs. } 6,00,000}{4} = \text{Rs. } 1,50,000$$

(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**

Year	Machine A				Machine B		
	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**

$$\text{NPV} = \text{Rs. } 8,18,909 - \text{Rs. } 8,00,000 = \text{Rs. } 18,09$$

Machine – B

$$\text{NPV} = \text{Rs. } 6,17,425 - \text{Rs. } 6,00,000 = \text{Rs. } 17,425$$

2. Discounted Payback Period**Machine – A**

$$\begin{aligned} \text{Discounted Payback Period} &= 3 + \frac{\text{Rs. } 8,00,000 - \text{Rs. } 5,31,437}{\text{Rs. } 2,87,472} \\ &= 3 + 0.934 \\ &= 3.934 \text{ years or } 3 \text{ years } 11.21 \text{ months} \end{aligned}$$

Machine – B

$$\begin{aligned} \text{Discounted Payback Period} &= 3 + \frac{\text{Rs. } 6,00,000 - \text{Rs. } 5,22,025}{\text{Rs. } 95,400} \\ &= 3 + 0.817 \\ &= 3.817 \text{ years or } 3 \text{ years } 9.80 \text{ months} \end{aligned}$$

3. PI (Profitability Index)**Machine – A**

$$\text{Profitability Index} = \frac{\text{Rs. } 8,18,909}{\text{Rs. } 8,00,000} = 1.024$$

Machine – B

$$\text{Profitability Index} = \frac{\text{Rs. } 6,17,425}{\text{Rs. } 6,00,000} = 1.029$$

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)
	2,08,000	2,58,000	50,000
Total Cost (B)			
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%		(1,40,000)
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 (Rs.)	PV @ 15%	PV (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	(4,00,000)	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 5 years 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

* $(30\% \text{ of } 2.393 - 30\% \text{ of } 1.063) = 0.7179 - 0.3189 = 0.3990$

$4.375 + (2.50 - .25)/5 = 4.825$

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:

- If Commission income of Rs. 12000 p.a. is before taxes.
- 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 $(80,000 - 6,000) \div 8$	(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 (1 st 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 8 th year	0.467	10,799.38 (23,125 × 0.467)	9,118.18 (19,525 × 0.467)
C	PV of cash inflows		94,146.76	74,944.36
D	Less: Cash Outflow	1.00	(80,000)	(80,000)
E	Net Present Value (NPV)		<u>14,146.76</u>	<u>(5,055.64)</u>
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	<u>1,18,750</u>
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 x 0.893)							1,78,600
Less: Initial Cash Outflow - Year 0							2,50,000
Year 2 (Rs. 3,00,000 x 0.797)							2,39,100
Add: Working Capital released - Year 4 (Rs. 5,50,000 x 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	<u>12,00,000</u>
Replaced cost of old machine	2,40,000
Cost of removal	<u>40,000</u>
Net Purchase price	10,00,000
Outflow at year 0	8,00,000
Outflow at year 1	2,00,000

Computation of additional depreciation

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 :

- Payback period Method
- Net Present value Method
- 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) :

$$\begin{aligned}
 \text{Profitability Index (PI)} &= \frac{\text{Sum of present value of net cash inflow}}{\text{Initial cash outflow}} \\
 &= \frac{4,38,594 + 27,941}{5,00,000} = 0.93
 \end{aligned}$$

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 (PBTDA) (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 Capital	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
				<u>4,22,280</u>
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:

$$10\% + \frac{86,543}{86,543 - (-1,22,720)} \times 10\%$$

$$10\% + \frac{86,543}{2,09,263} \times 10\%$$

$$RS. = 10\% + 4.14\% = 14.14\%$$

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.

SOLUTION :

Calculation of Net Initial Cash Outflows:

Particulars	Rs.
Cost of new machine	24,00,000
Less: Sale proceeds of existing machine	(1,80,000)
Add: Installation	1,40,000
Add: Testing	60,000
Less: Subsidy from government (15% of 24,00,000) x 0.877	(3,15,720)
Net initial cash outflows	21,04,280

Calculation of Incremental Depreciation

Particulars	Rs.
Depreciation on existing machine (4,80,000/6) (i)	80,000
Depreciation base of New Machine	
Cost of new machine	24,00,000
Add: Installation	1,40,000
Add: Testing	60,000
Less: Subsidy from government	(3,60,000)
Less: Salvage value at the end of 6th year	(3,20,000)
Depreciation base of New Machine	19,20,000
Depreciation on New Machine (19,20,000/6) (ii)	3,20,000
Incremental depreciation [(ii) – (i)]	2,40,000

Computation of Annual Operating Cash flow after tax (CFAT)

Particulars	Amount (Rs.)	Amount (Rs.)
Savings in cost		
Cost of 3 skilled workers (Rs.1,68,000 x 3)	5,04,000	
Reduced wastage of material	4,80,000	
Saving in loss of sales	3,50,000	
Total		13,34,000
Less: Increase in cost		
Salary to trained technician	3,90,000	
Increase in annual operation and maintenance cost	1,54,000	
Total		-5,44,000
Incremental Saving before tax and depreciation		7,90,000

Less: Incremental Depreciation	-2,40,000
Incremental PBT	5,50,000
Less: Tax @30%	-1,65,000
PAT	3,85,000
Add: Depreciation	2,40,000
Incremental CFAT	6,25,000

Calculation of NPV

Particulars	Year	Net Cashflow (Rs.)	PVF @ 14%	PV (Rs.)
Net initial cash outflows	0	(24,20,000)	1	(21,04,280)
Incremental CFAT	1 to 6	6,25,000	3.888	24,30,000
Salvage Value of New Machine	6	3,20,000	0.456	1,45,920
PV of inflows				25,75,920
Net Present Value				4,71,640

$$\text{Profitability Index} = \frac{\text{Sum of discounted cash inflows}}{\text{Initial cash outlay or Total discounted cash outflow (as the case may)}}$$

$$= 25,75,920 / 21,04,280 = \mathbf{1.224}$$

Advise: Since the NPV is positive and PI is greater than 1, the company should replace the machine

Computation of Discounted Payback Period

Year	Cashflow	PVF @ 14%	PV of CFs (Rs.)	Cumulative PV (Rs.)
1	6,25,000	0.877	5,48,125	5,48,125
2	6,25,000	0.769	4,80,625	10,28,750
3	6,25,000	0.675	4,21,875	14,50,625
4	6,25,000	0.592	3,70,000	18,20,625
5	6,25,000	0.519	3,24,375	21,45,000
6	9,45,000	0.456	4,30,920	25,75,920

Discounted Payback Period

$$= 4 + \frac{21,04,280 - 18,20,625}{3,24,375}$$

$$= \mathbf{4.87 \text{ years}}$$

If we take subsidy in cash inflow of 1st year, then solution can also be done in the following way:

Calculation of Net Initial Cash Outflows:

Particulars	Rs.
Cost of new machine	24,00,000
Less: Sale proceeds of existing machine	(1,80,000)

Add: Installation	1,40,000
Add: Testing	60,000
Net initial cash outflows	24,20,000

Note: However, Incremental Depreciation and CFAT will remain same.

Calculation of NPV

Particulars	Year	Net Cashflow (Rs.)	PVF @ 14%	PV (Rs.)
Net initial cash outflows	0	-24,20,000	1	(24,20,000)
Subsidy	1	3,60,000	0.877	3,15,720
Incremental CFAT	1 to 6	6,25,000	3.888	24,30,000
Salvage Value of New Machine	6	3,20,000	0.456	1,45,920
PV of inflows				28,91,640
Net Present Value				4,71,640

$$\text{Profitability Index} = \frac{\text{Sum of discounted cash inflows}}{\text{Initial cash outlay or Total discounted cash outflow (as the case may)}}$$

$$= 28,91,640 / 24,20,000 = \mathbf{1.195}$$

Advise: Since the NPV is positive and PI is greater than 1, the company should replace the machine

Computation of Discounted Payback Period

Year	Cashflow	PVF @ 14%	PV of CFs (Rs.)	Cumulative PV (Rs.)
1	9,85,000	0.877	8,63,845	8,63,845
2	6,25,000	0.769	4,80,625	13,44,470
3	6,25,000	0.675	4,21,875	17,66,345
4	6,25,000	0.592	3,70,000	21,36,345
5	6,25,000	0.519	3,24,375	24,60,720
6	9,45,000	0.456	4,30,920	28,91,640

Discounted Payback Period

$$= 4 + \frac{24,20,000 - 21,36,345}{3,24,375}$$

$$= \mathbf{4.87 \text{ years}}$$

QUESTION 24 : RTP - JAN 2025

A company is considering the proposal to take up a new project which requires investment of Rs. 850 lakhs in plant & machinery and Rs. 150 lakhs in working capital. The project is expected to yield the following Cash flows before tax and depreciation over the next five years:

Year	Amount (Rs. in Lakhs)
1	290
2	320
3	360

4	390
5	270

The desired rate of return from the project is 14% and assets must be depreciated at 20% on a written down value basis. The scrap value at the end of the five-year period may be taken as Rs. 140 lakhs. The income tax applicable to the company is 20%. This is the only asset in the entire block. Capital gains tax is at 15% (for capital loss as well)

You are required to CALCULATE the net present value of the project and advise the management to take appropriate decisions. Also calculate the Internal Rate of Return and Desirability factor of the Project.

Note: Present values of Re. 1 at different rates of interest are as follows:

Year	14%	16%	20%
1	0.88	0.86	0.83
2	0.77	0.74	0.69
3	0.67	0.64	0.58
4	0.59	0.55	0.48
5	0.52	0.48	0.40

SOLUTION :

(A) Calculation of NPV

WN 1 : Calculation of Present Value of Cash Outflow (PV CO)

- (i) Initial Investment = Rs. 850 lakhs
- (ii) Working capital outlay = Rs. 150 lakhs

Therefore, total PV CO = Rs. 1000 lakhs

WN 2 : Calculation of Present Value of Cash Inflows (PV CI)

Cash flows before tax are given i.e. nothing but NPBDT

	Amount (Rs. in lakhs)				
Year	1	2	3	4	5
NPBDT	290.00	320.00	360.00	390.00	270.00
(-) Dep	170.00	136.00	108.80	87.04	69.63
NPBT	120.00	184.00	251.20	302.96	200.37
(-) Tax	24.00	36.80	50.24	60.59	40.07
NPAT	96.00	147.20	200.96	242.37	160.29
(+) Dep	170.00	136.00	108.80	87.04	69.63
CFAT	266.00	283.20	309.76	329.41	229.93
(+) Working Capital Release					150.00
(+) Scrap					140.00
PV Factor @ 14%	0.88	0.77	0.67	0.59	0.52
PV CI	234.08	218.06	207.54	194.35	270.36

- (i) Total PV CI = Rs. 1124.40 Lakhs

WN 3 : Calculation of Present Value of tax savings on short term Capital loss

	Rs. in Lakhs
WDV at end of 5th year	278.53

(-) Sale value	140.00
Loss on sale	138.53
Tax savings on above @ 15%	20.78

PV of tax savings on short term capital loss (STCL) = Tax saving x PV factor (14%, 5th year)
= 20.78 x 0.52

= Rs. 10.81 lakhs

NPV = PV CI + PV of tax savings on STCL - PV CO

= 1124.40 + 10.81 - 1000

NPV = Rs. 135.20 lakhs

Advise: Since the NPV of the project is positive, project should be accepted

(B) Calculation of IRR

IRR is that discounting rate where NPV = 0 (point where PV of all CI = PV Co)

We know that @ 14%, NPV is Rs. 135.20, so by trial-and-error method we need to calculate that rate where NPV equals 0.

When Discounting rate is 16%

	1	2	3	4	5
CFAT	266.00	283.20	309.76	329.41	229.93
(+) Working Capital Release					150.00
(+) Scrap					140.00
PV Factor @ 14%	0.86	0.74	0.64	0.55	0.48
PV CI	228.76	209.57	198.25	181.17	249.56

PV CI = 1067.31

(+) PV of tax savings on STCL = 9.97 {20.78 x 0.48}

(-) PV CO = (1000)

NPV = Rs. 77.29

Since NPV is positive at 16% as well, we need to go for Trial II at 20%

When Discounting rate is 20%

	1	2	3	4	5
CFAT	266.00	283.20	309.76	329.41	229.93
(+) Working Capital Release					150.00
(+) Scrap					140.00
PV Factor @ 14%	0.83	0.69	0.58	0.48	0.40
PV CI	220.78	195.41	179.66	158.12	207.97

PV CI = 961.94

(+) PV of tax savings on STCL = 8.31 {20.78 x 0.40}

(-) PV CO = (1000)

NPV = Rs. (29.75)

Since NPV is negative at 20%, IRR lies somewhere between 16% and 20%

IRR = LR + $\frac{\text{NPV at LR}}{\text{NPV at LR} - \text{NPV at HR}} \times (\text{HR} - \text{LR})$

LR = Lower Rate (16% here)

HR = Higher Rate (20% here)

$$IRR = 16 + \frac{77.29}{77.29 - (-29.75)} \times (20 - 16)$$

$$IRR = 18.89\%$$

(C) Calculation of Desirability Factory (Profitability Index)

$$PI = \text{TOTAL PV CI} / \text{PV CO}$$

$$PI = 1135.21 / 1000$$

$$PI = 1.13521$$

QUESTION 25 : PAPER - JAN 2025

SRT Limited manufactures steel rods and is now considering to purchase a new aluminium smelting and moulding plant. This plant will have the cost of Rs. 20,00,000 to purchase and install the plant. It has a useful life of 5 years with a residual value of Rs. 1,00,000. Production and sales from the new plant are expected to be 1,00,000 units per year. Other estimates are as follows:

Selling Price	Rs.150 per unit
Direct Cost	Rs.100 per unit

Fixed cost (including depreciation) is Rs. 8,00,000 per annum. Marketing and promotion cost not included in the above will be Rs. 1,00,000 and Rs. 1,60,000 for years 1 and 2, respectively. Additionally, investment in debtors and stocks will increase in year 1 by Rs. 1,50,000 and Rs. 2,00,000, respectively. Creditors will also increase by Rs. 1,00,000 in year 1. Thus, debtors, stocks, and creditors will be recouped at the end of the fifth year.

The cost of capital is 18%. Corporate tax is 30% and is paid in the year in which profits are made. Depreciation is tax deductible. The company follows straight line method of depreciation.

Required:

- Calculate the Net Present Value and Profitability Index of the project.
- Advise SRT Limited whether the plant should be purchased.

The PV factors at 18% are:

Year	1	2	3	4	5
PV factor	0.847	0.718	0.609	0.516	0.437

SOLUTION :**Calculation Net Present Value (NPV)**

Years	1	2	3	4	5	Total
Units	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	
(I) Sales (Rs. 150 per unit)	1,50,00,000	1,50,00,000	1,50,00,000	1,50,00,000	1,50,00,000	
(II) Cost						
Direct cost (Rs.100 per unit)	1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000	
Marketing cost	1,00,000	1,60,000				
Depreciation	3,80,000	3,80,000	3,80,000	3,80,000	3,80,000	
Fixed cost	4,20,000	4,20,000	4,20,000	4,20,000	4,20,000	
Total cost	1,09,00,000	1,09,60,000	1,08,00,000	1,08,00,000	1,08,00,000	
Profit (I - II)	41,00,000	40,40,000	42,00,000	42,00,000	42,00,000	
Tax @30%	12,30,000	12,12,000	12,60,000	12,60,000	12,60,000	
Profit After tax	28,70,000	28,28,000	29,40,000	29,40,000	29,40,000	
Add back depreciation	3,80,000	3,80,000	3,80,000	3,80,000	3,80,000	
Cash inflow after tax	32,50,000	32,08,000	33,20,000	33,20,000	33,20,000	
Add: WC released					2,50,000	
Add: Residual value of machine					1,00,000	

Net cash inflow after tax	32,50,000	32,08,000	33,20,000	33,20,000	36,70,000	
Present value factor	0.847	0.718	0.609	0.516	0.437	
Present value cash inflow	27,52,750	23,03,344	20,21,880	17,13,120	16,03,790	1,03,94,884
Less: initial cash outflow (20,00,000 + 2,50,000)						22,50,000
NPV						81,44,884

Initial Investment = 22,50,000 (assumed working capital invested at start of the year)

Profitability Index (PI)

$$= \frac{\text{Sum of discounted cash inflows}}{\text{Initial cash outlay or Total discounted cash outflow (as the case may)}}$$

$$= 1,03,94,884 / 22,50,000 = 4.62$$

Advise: Since the plant has a positive NPV and the Profitability Index is >1, therefore, it should be purchased.

Note: If we assume that working capital increased at end of the first year then cash outflow will be (20,00,000 + 2,11,750 (2,50,000 x 0.847)) = 22,11,750, NPV 81,83,134 and Profitability Index will be = 1,03,94,884 / 22,11,750 = 4.70.

QUESTION 26 : PAPER - MAY 2025

Following data are given for a capital project:

Annual interim cash inflows for first two years	Rs. 1,00,000
Annual interim cash inflows for next two years	Rs. 80,000
Useful life	4 Years
Salvage value at end of the project	Rs. 50,000
Internal rate of return	12%
Cost of capital	10%

You are required to calculate the following:

- Initial investment
- Net present value
- Profitability Index
- Discounted payback period
- MIRR

Year	1	2	3	4
PVIF _{0.09, t}	0.917	0.842	0.772	0.708
PVIF _{0.10, t}	0.909	0.826	0.751	0.683
PVIF _{0.11, t}	0.901	0.812	0.731	0.659
PVIF _{0.12, t}	0.893	0.797	0.712	0.636
PVIF _{0.10, t}	1.100	1.210	1.331	1.464
PVIF _{0.12, t}	1.120	1.254	1.405	1.574

SOLUTION :

(i) **Initial Investment**

Using IRR = 12%, the NPV is zero. So, the initial investment is equal to the present value of inflows at 12%.

Year	Cash Inflows (Rs.)	PVF@12%	Present Value (Rs.)
1	1,00,000	0.893	89,300

2	1,00,000	0.797	79,700
3	80,000	0.712	56,960
4	80,000	0.636	50,880
4	50,000 (salvage)	0.636	31,800
		Total	3,08,640

Total Present Value = Rs. 3,08,640. So, Initial Investment = Rs. 3,08,640.

(ii) Net Present Value (NPV)

Year	Cash Flows (Rs.)	PVF@10%	Present Value (Rs.)
0	(3,08,640)	1	(3,08,640)
1	1,00,000	0.909	90,900
2	1,00,000	0.826	82,600
3	80,000	0.751	60,080
4	80,000	0.683	54,640
4	50,000 (salvage)	0.683	34,150
Sum of PV of Cash Inflows			3,22,370
(3,22,370-3,08,640)			13,730

(iii) Profitability Index (PI)

$$PI = \frac{\text{Sum of PV of Cash Inflows}}{\text{Initial Cash Outflow}} = \frac{\text{Rs.} 3,22,370}{\text{Rs.} 3,08,640} = 1.0445$$

(iv) Discounted Payback Period:

Year	Cash Flows (Rs.)	PVF@10%	PV (Rs.)	Cumulative PV (Rs.)
1	1,00,000	0.909	90,900	90,900
2	1,00,000	0.826	82,600	1,73,500
3	80,000	0.751	60,080	2,33,580
4	1,30,000 (including salvage)	0.683	88,790	3,22,370

So, discounted payback = 3 years + $\frac{\text{Rs.} 3,08,640 - \text{Rs.} 2,33,580}{\text{Rs.} 88,790} = 3.845$ years OR 3.85 years

OR 3 years 10 months 4 days approx.

(v) Modified Internal Rate of Return (MIRR)

Terminal value of cash inflows compounded to year 4 using 10%:

Year	Cash Flows (Rs.)	@ 10% reinvestment rate factor	Present Value (Rs.)
1	1,00,000	1.331	1,33,100
2	1,00,000	1.210	1,21,000
3	80,000	1.100	88,000
4	80,000	1.000	80,000
4	50,000 (salvage)	1.000	50,000
Total			4,72,100

Total Terminal Value = Rs. 4,72,100

Now, $3,08,640/4,72,100 = 0.6537$ or 0.654

If we see 0.654 in year of present value discount table, the rate which is coming is around 11.20% . So, MIRR is around 11.20% .

Alternatively, solution can be presented in following way for MIRR:

Total Return = $4,72,100/3,08,640 = 1.5296$

$(1+r)^4 = 1.5296$

MIRR = $(1.5296)^{(1/4)} - 1 = 11.20\%$ (Approx)

QUESTION 27 : PAPER - SEPT 2025

Global Beverage Corporation is considering replacing one of its bottling machines with a newer and more efficient model. The existing machine was purchased five years ago for Rs. 16,00,000 and has a total useful life of ten years. Currently, the company can sell this machine for Rs. 9,60,000. The new machine costs Rs. 32,00,000 having an estimated salvage value of Rs. 3,20,000 and a useful life of five years. With the new machine, annual contribution margin is projected to increase from Rs. 16,00,000 to Rs. 18,40,000 and operating efficiencies are expected to yield further annual savings of Rs. 3,20,000. Depreciation is calculated on a straight-line method over the machine's five-year life. The company's cost of capital is 12% and corporate tax rate is 33% . You are required to calculate the Net Present Value of new machine.

Given: $PVIFA_{0.12,5}$ is 3.605 and $PVIF_{0.12,5}$ is 0.567 .

SOLUTION :

Calculation of Net Initial Cash Outflows:

Particulars	Rs.
Cost of new machine	32,00,000
Less: Sale proceeds of existing machine	(9,60,000)
Add: Tax paid on sale of existing machine $\{(9,60,000 - 8,00,000) \times 33\}$	52,800
Net initial cash outflows	22,92,800

Calculation of Net Present Value of new machine

Particulars	Rs.
Incremental Contribution	2,40,000
Add: Cost saving	3,20,000
Savings	5,60,000
Less: Incremental Depreciation $\{5,76,000-1,60,000\}$	4,16,000
Incremental Profit Before Tax	1,44,000
Less: Tax @ 33%	47,520
Profit After Tax	96,480
Add: Depreciation	4,16,000
Cash Inflow	5,12,480
PVIFA	3.605
PV of Cash Inflow	18,47,490

Add: PV of Salvage Value of new machine (Rs. 3,20,000 x 0.567)	1,81,440
Total PV of Cash Inflow	20,28,930
Less: Initial Cash Outflow	22,92,800
NPV	(2,63,870)

If Tax on sale of existing machine is not taken

Calculation of Net Initial Cash Outflows :

Particulars	Rs.
Cost of new machine	32,00,000
Less: Sale proceeds of existing machine	(9,60,000)
Net initial cash outflows	22,40,000

Accordingly, NPV Will be Rs. 20,28,930 - Rs. 22,40,000 = (Rs. 2,11,070)

QUESTION 28 : RTP - JAN 2026

ABC Manufacturing Ltd is a mid-sized engineering and fabrication company that supplies precision components to the automobile and heavy machinery sectors. In order to maintain competitiveness and expand its market share, the company has proposed a new capital investment project involving the purchase and installation of advanced Computer Numerical Control (CNC) machines and automated assembly lines.

The estimated cost of the project is to be financed partly through internal accruals and largely through term loans from XYZ Bank. ABC Manufacturing has approached the bank requesting project financing of the initial outlay, citing strong growth potential in demand for precision-engineered products over the next decade.

Financial Projections Provided by ABC Manufacturing Ltd.

The company's feasibility report outlines the following:

- The simple payback period is estimated at 5 years, assuming cumulative cash inflows cover the initial investment within that timeframe without considering the time value of money.
- The discounted payback period is calculated at 7 years, after discounting projected cash inflows at the weighted average cost of capital (WACC).
- The project's Modified Internal Rate of Return (MIRR) is projected at 10.9%, which is much lower than the incremental borrowing rate.
- Terminal Value of the annual cash inflows reinvested at the rate of 10% is Rs. 11,43,589.
- Cash inflows are expected to be received equally and steadily at the end of every year over the life of the assets. However, the same Cash inflows are expected to be received even after the simple payback period due to efficiency gains, market expansion, and economies of scale.

(Note: Round off Initial investment to nearest Lakhs).

Management's Position

ABC Manufacturing argues that:

1. The project is strategically essential for long-term survival in a competitive industry.
2. The simple payback of 5 years indicates that the investment risk is acceptable.
3. Although the discounted payback of 7 years is relatively long, the project will continue to generate positive inflows 1 year beyond this period.

4. MIRR of 10.9% should be interpreted in light of industry cyclicity, expected market growth, and non-financial benefits such as improved brand reputation and quality standards.

Bank's Concerns

The credit appraisal team at XYZ Bank has raised several concerns:

- Reliance on payback methods alone ignores long-term profitability, and risk factors.
- Industry volatility, competition, and technological obsolescence may affect the reliability of projected cash flows.

The credit team must now prepare a recommendation on whether to finance the project and, if so, under what conditions. Assuming you were the credit analyst, prepare justification report with a reasoned argument based on other financial considerations namely, PI, NPV, IRR & ARR in the following format.

Appraisal technic	Acceptable range	Outcome for this asset	Recommendation
NPV			
MIRR			
Simple payback			
Discount payback			
ARR			
PI			

Note: For ARR, use the formula Profit after tax

Consider the following PVAF:

PVAF @ 9% for 7 years = 5 & PVAF @ 9% for 8 years = 5.535

SOLUTION :

Under MIRR, if the cash flows are equal over the life of the asset

$$\text{Initial investment} \times (1 + \text{MIRR})^n = \text{CFAT} \times \text{FVAF}$$

$$\text{Terminal Value (CFAT} \times \text{FVAF)} = \text{Rs. 11,43,589}$$

$$\text{Initial investment} \times (1 + 10.9\%)^8 = \text{Rs. 11,43,589}$$

$$\text{Initial investment} = 11,43,589 / (1 + 10.9\%)^8 = 5,00,000 \text{ (rounded off to nearest lakh)}$$

Under simple payback period, if the cash flows are equal over the life of the asset

$$\text{Payback Period} = \frac{\text{Total initial capital investment}}{\text{Annual expected after - tax net cash flow}}$$

$$\text{Initial investment} = \text{CFAT} \times \text{Simple payback period in years}$$

$$5,00,000 = 5 \times \text{CFAT}$$

$$\text{CFAT} = 1,00,000$$

Under Discounted payback period, if the cash flows are equal over the life of the asset

$$\text{PVAF} = \frac{\text{Total initial capital investment}}{\text{Annual expected after - tax net cash flow}}$$

$$\text{Initial investment} = \text{CFAT} \times \text{PVAF @ WACC\% for 7 years}$$

$$5,00,000 = 1,00,000 \times \text{PVAF @ WACC\% for 7 years}$$

$$\text{PVAF @ WACC\% for 7 years} = 5$$

$$\text{So, WACC} = 9\%$$

NPV = Sum of Present Values of Cash inflows – Cost of the Project
 = 1,00,000 x 5.535 – 5,00,000 = 53,500

Profitability Index = $\frac{\text{Sum of present value of net cash inflow}}{\text{Initial cash outflow}}$
 = $\frac{\text{Rs.5,53,500}}{\text{Rs.5,00,000}} = 1.107$

PAT = CFAT – Depreciation
 = 1,00,000 – $\frac{5,00,000}{8} = 37,500$

ARR = $\frac{\text{Profit after Depreciation}}{\text{Investment in the beginning of the year}} \times 100$
 = $\frac{37,500}{5,00,000} = 7.5\%$

Appraisal technic	Acceptable range	Outcome for this asset	Recommendation
NPV	> 0	53,500	Accept
MIRR	MIRR > WACC	10.9% > 9%	Accept
Simple payback	Payback < Life	5 < 8	Accept
Discount payback	Payback < Life	7 < 8	Accept
ARR	ARR > WACC	7.5% < 9%	Reject
PI	> 1	1.107	Accept

QUESTION 29 : PAPER - JAN 2026

Algo Steel Ltd. is a well-established company in the steel manufacturing sector, successfully operating for the past 20 years. The existing capital structure comprises of 80% equity and 20% debt. Company's Cost of Equity (K) is 13.5%, reflecting the return expected by shareholders. Its debt component comprises of a bank loan carrying an interest rate of 8% per annum. The company is subject to taxation and taxes are to be considered in project evaluation. After preliminary evaluation, the Board of Directors has shortlisted a project with the following details:

Particulars	
Initial Investment	Rs. 24,00,000
Estimated Salvage Value	10% of Initial Investment
Expected Life of the Project	4 years
Tax Savings on Depreciation	Rs. 1,35,000 p.a.
Method of Depreciation	Straight Line Method (SLM)

Particulars	Year 1	Year 2	Year 3	Year 4
Expected Cash Flows before depreciation & tax (in Rs.)	12,00,000	20,00,000	18,00,000	16,00,000
PV Factor @ 10.00%	0.909	0.826	0.751	0.683
PV Factor @ 12.00%	0.893	0.797	0.712	0.636

Required:

- (i) Calculate Average Rate of Return (ARR) based on Average Investment.

- (ii) Calculate Net Present Value (NPV) by using Weighted Average Cost of Capital (WACC).

SOLUTION :

$$\text{Annual Depreciation} = \frac{21,60,000 - (24,00,000 - 2,40,000)}{4}$$

$$= \text{Rs. } 5,40,000$$

$$\text{Tax Saving on Depreciation} = \text{Depreciation} \times \text{Tax Rate}$$

$$1,35,000 = 5,40,000 \times \text{Tax Rate}$$

$$\text{Tax Rate} = 25\%$$

(i) Average Rate of Return (ARR)

Statement of Profit after Tax

Particulars	Year 1 (Rs.)	Year 2 (Rs.)	Year 3 (Rs.)	Year 4 (Rs.)
Cash flow before dep. & tax	12,00,000	20,00,000	18,00,000	16,00,000
Less: Depreciation	5,40,000	5,40,000	5,40,000	5,40,000
Profit before tax	6,60,000	14,60,000	12,60,000	10,60,000
Less: Tax @ 25%	1,65,000	3,65,000	3,15,000	2,65,000
Profit after tax (PAT)	4,95,000	10,95,000	9,45,000	7,95,000

$$\text{Average Rate of Return (ARR)} = \frac{\text{Average annual net income (PAT)}}{\text{Average Investment}}$$

$$\text{Total PAT} = 4,95,000 + 10,95,000 + 9,45,000 + 7,95,000$$

$$= \text{Rs. } 33,30,000$$

$$\text{Average PAT} = \frac{33,30,000}{4} = \text{Rs. } 8,32,500$$

$$\text{Average Investment} = (\text{Rs. } 24,00,000 + \text{Rs. } 2,40,000)/2 = \text{Rs. } 13,20,000$$

$$\text{Or, Average Investment} = \frac{1}{2} (\text{Initial Investment} - \text{Salvage Value}) + \text{Salvage Value}$$

$$= \frac{1}{2} (\text{Rs. } 24,00,000 - \text{Rs. } 2,40,000) + \text{Rs. } 2,40,000$$

$$= \text{Rs. } 13,20,000$$

$$\text{ARR} = \frac{8,32,500}{13,20,000} \times 100 = 63.068\% \text{ or } 63.07\%$$

(ii) Calculation of WACC

$$\text{WACC} = (0.80 \times 13.5\%) + \{0.20 \times 6\% (8\% \times 0.75)\}$$

$$= 10.8\% + 1.2\%$$

$$= 12\%$$

Statement of Cash Flows after Tax

Particulars	Year 1 (Rs.)	Year 2 (Rs.)	Year 3 (Rs.)	Year 4 (Rs.)	Year 4 (Rs.)
Profit after tax (PAT)	4,95,000	10,95,000	9,45,000	7,95,000	
Add: Depreciation	5,40,000	5,40,000	5,40,000	5,40,000	
Cash Flow after Tax (CFAT)	10,35,000	16,35,000	14,85,000	13,35,000	2,40,000 (Salvage Value)

PV Factor @12%	0.893	0.797	0.712	0.636	0.636
PV	9,24,255	13,03,095	10,57,320	8,49,060	1,52,640

Total PV of Inflows = Rs. 42,86,370

NPV = PV of Inflows – Initial Investment

= 42,86,370 – 24,00,000

= Rs.18,86,370

QUESTION 30 : RTP - MAY 2026

EquipLease Financial Services Ltd. is a specialized equipment leasing company that has been operating in the industrial equipment financing space for over 15 years. The company's business model involves purchasing high-value machinery and leasing it to manufacturing companies, thereby earning returns through lease rentals while retaining ownership of the assets. The company has built a strong reputation for providing flexible financing solutions tailored to clients' cash flow patterns and business cycles. Their leasing arrangements help clients conserve capital while accessing state-of-the-art equipment.

EquipLease has recently purchased a specialized CNC precision machine with the following informations:

- **Purchase Cost:** Rs. 10,00,000 (paid upfront)
- **Expected Useful Life:** 4 years
- **Residual/Salvage Value:** Nil (technology becomes obsolete)
- **Depreciation for Tax Purposes:** Can be claimed by EquipLease under Straight line method (SLM) or Units of Production method(UOP)
- **Lease Rentals** earned by company is subject to tax.
- **EquipLease's Cost of Capital:** 10% per annum
- **Corporate Tax Rate:** 25%

TechManufacture Industries Ltd., a growing precision engineering company, has approached EquipLease expressing interest in leasing this CNC machine. TechManufacture has provided detailed information about their expected utilization pattern:

The machine's usage will follow a graduated ramp-up pattern based on TechManufacture's order book projections:

Year	Production Capacity Utilization	Relative Units
1	Low (Initial phase)	1 unit
2	Medium	2 units
3	High	3 units
4	Peak	4 units

This pattern is typical for businesses scaling up production with new equipment - starting slow as operators are trained and processes are optimized, then ramping up to full capacity. The Client wants the company to charge lease rentals based on the client's utilization pattern 1:2:3:4.

Mr. Vikram Malhotra, the Chief Credit Officer at EquipLease, is tasked with structuring an appropriate lease arrangement. He faces several strategic decisions:

- HOW MUCH portion of the cost is recovered from tax savings on depreciation under both the methods viz. SLM & units of production method.

- ii. FIND the portion of investment to be recovered from lease rentals under both the assumptions i.e. Depreciation under both the methods viz. SLM & units of production method.
- iii. DETERMINE minimum lease rentals needed to recover the balance cost of investment after adjusting the Tax shields on the depreciation under both the depreciation methods if -
 - EquipLease charge uniform (equal) rentals over 4 years
 - Lease rentals follow the client's utilization pattern (1:2:3:4)

SOLUTION :**Calculation of PV of Tax savings under Straight line method (SLM)**

Particulars	Result
Annual Depreciation	10 Lakhs / 4 Years = 2,50,000
PV of Tax savings on above	2,50,000 Lakhs x 25% x PVAF @ 10% i.e. 3.170 = 1,98,125

Calculation of PV of Tax savings under Units of Production (UOP)

Year	Depreciation	Tax savings	PVF @ 10%	PV of Tax Savings
1	1,00,000	25,000	0.909	22,725
2	2,00,000	50,000	0.826	41,300
3	3,00,000	75,000	0.751	56,325
4	4,00,000	1,00,000	0.683	68,300
				1,88,650

Let lease rental of 1st year be X

PV of after tax Lease rentals charged as per client's utilization pattern

Year	Lease rentals	After Tax Lease Rentals	PVF @ 10%	PV of Lease Rentals
1	X	0.75X	0.909	0.682X
2	2X	1.5X	0.826	1.239X
3	3X	2.25X	0.751	1.690X
4	4X	3X	0.683	2.049X
				5.660X

PV of after tax Lease rentals charged equally

Let annual lease rental be X

$$X \times (1 - 25\%) \times 3.17(\text{PVAF @ 10\%}) = 2.378X$$

Investment to be recovered from lease rentals

Particulars	In UOP Ratio		Equally	
	SLM	UOP	SLM	UOP
Investment	10,00,000	10,00,000	10,00,000	10,00,000
PV of Tax savings on Depreciation	1,98,125	1,88,650	1,98,125	1,88,650

Investment to be recovered	8,01,875	8,11,350	8,01,875	8,11,350
PV of after-tax Lease rentals	5.660X	5.660X	2.378X	2.378X
Lease rentals = X	1,41,674	1,43,348	3,37,206	3,41,190

Statement Showing PV of yearly lease rentals when charged in UOP Ratio

Year	Particulars	SLM	UOP
	Lease rentals = X	1,41,674	1,43,348
1	0.682X	96,622	97,763
2	1.239X	1,75,534	1,77,608
3	1.690X	2,39,429	2,42,258
4	<u>2.049X</u>	2,90,290	2,93,720
	PV of Total after tax lease rental	8,01,875	8,11,350

Statement Showing PV of yearly lease rentals when charged Equally

Year	Particulars	SLM	UOP
	Lease rentals = X	3,37,206	3,41,190
1	0.682X (0.909 x 0.75)	2,29,974	2,32,692
2	0.620X (0.826 x 0.75)	2,09,068	2,11,538
3	0.563X (0.751 x 0.75)	1,89,847	1,92,090
4	<u>0.512X (0.683 x 0.75)</u>	1,72,649	1,74,689
	PV of Total after tax lease rental	8,01,539*	8,11,009*

* Difference is due to rounding off in PVAF

QUESTION 31 : PAPER - MAY 2026

R Ltd. wants to reduce the dependency of manual workforce in the operation of its factory by adopting automatic machine. It has two options under consideration Machine M and Machine N. Both the machines serve the same job and are also able to satisfy the purpose of the company.

Details of both the machines are given below:

	Machine M	Machine N
Purchase cost (Rs.)	4,50,000	3,50,000
Estimated useful life	5 years	7 years
Estimated salvage value (% of cost)	10%	10%
Annual saving to wages (Rs.)	11,00,000	12,00,000
Running cost per year (excl. depreciation) (Rs.)	9,00,000	11,00,000
Annual saving in scrap due to use of machine in place of manual work force (Rs.)	1,00,000	1,20,000

The Company's cost of capital is 9%. Corporate tax rate is 25%. Depreciation will be charged on SLM basis.

(i) Calculate NPV and Profitability index for each machine.

(ii) Which machine should be selected on the basis of Equivalent Annualized Criterion?

Year	1	2	3	4	5	6	7
PVIF _{0.09, t}	0.917	0.842	0.772	0.708	0.650	0.596	0.547
PVIFA _{0.09, t}	0.917	1.759	2.531	3.239	3.889	4.485	5.032

SOLUTION :

Evaluation of Alternatives

Working Notes:

$$\text{Depreciation on Machine M} = \frac{(4,50,000 - 45,000)}{5} = \text{Rs.}81,000$$

$$\text{Depreciation on Machine N} = \frac{(3,50,000 - 35,000)}{7} = \text{Rs.}45,000$$

(i) NPV and PI for each machine

Particulars	Machine M (Rs.)	Machine N (Rs.)
Annual Savings:		
Direct Wages	11,00,000	12,00,000
Scraps	1,00,000	1,20,000
Total Savings (A)	12,00,000	13,20,000
Annual Running Cost (B)	9,00,000	11,00,000
Annual Cash Savings (A-B)	3,00,000	2,20,000
Less: Depreciation	81,000	45,000
Annual Savings before Tax	2,19,000	1,75,000
Less: Tax @ 25%	54,750	43,750
Annual Savings /Profits after tax	1,64,250	1,31,250
Add: Depreciation	81,000	45,000
Annual Cash Inflows	2,45,250	1,76,250
PVIFA	3.889	5.032
PV of Annual Cash Inflows	9,53,777.25	8,87,890
PV of Salvage Value	45,000 x 0.650 = Rs. 29,250	35,000 x 0.547 = Rs. 19,145
Total PV of Inflows	9,83,027.25	9,06,035
NPV	9,83,027.25 - 4,50,000 = Rs.5,33,027.25	9,06,035 - 3,50,000 = Rs. 5,56,035
PV Index = $\frac{\text{Present Value of Cash Inflow}}{\text{Investment}}$	$\frac{9,83,027.25}{4,50,000} = 2.18$	$\frac{9,06,035}{3,50,000} = 2.59$

(ii) Equivalent Annualized NPV

$$\text{Machine M} = \frac{5,33,027.25}{3.889} = \text{Rs.1,37,060/-}$$

$$\text{Machine N} = \frac{5,56,035}{5.032} = \text{Rs.1,10,500/-}$$

So machine M should be selected on the basis of Equivalent Annualized Criterion.

QUESTION 32 : RTP – SEPT 2026

The management of P Limited is evaluating two mutually exclusive investment alternatives, namely Machine I and Machine II, for acquisition. The company has a cost of capital of 12% and is subject to a corporate tax rate of 30%.

The relevant details of the two machines are provided below:

Particulars	Machine I	Machine II
Initial Cost of Machine	Rs. 10,00,000	Rs. 15,00,000
Useful Life	5 years	6 years
Annual Income Before Depreciation and Tax	Rs. 3,45,000	Rs. 4,55,000

Additional Information:

- Depreciation is to be charged using the Straight-Line Method (SLM) over the useful life of each machine.

Required:

- Compute the following capital budgeting indicators for each machine:
 - Discounted Payback Period (DPP)
 - Net Present Value (NPV)
 - Internal Rate of Return (IRR)
- Based on the results obtained, recommend which machine should be selected by the management of P Limited, providing appropriate justification.

The present value factors of Re. 1 are as follows:

Year	1	2	3	4	5	6
At 12%	.893	.797	.712	.636	.567	.507
At 13%	.885	.783	.693	.613	.543	.480
At 14%	.877	.769	.675	.592	.519	.456
At 15%	.870	.756	.658	.572	.497	.432
At 16%	.862	.743	.641	.552	.476	.410

SOLUTION :

- Computation of Discounted Payback Period, Net Present Value (NPV) and Internal Rate of Return (IRR) for Two Machines**

Calculation of Cash Inflows

	Machine - I (Rs.)	Machine - II (Rs.)
Annual Income before Tax and Depreciation	3,45,000	4,55,000
Less: Depreciation		

Machine – I: 10,00,000 / 5	2,00,000	-
Machine – II: 15,00,000 / 6	<u>-</u>	<u>2,50,000</u>
Income before Tax	1,45,000	2,05,000
Less: Tax @ 30 %	<u>43,500</u>	<u>61,500</u>
Income after Tax	1,01,500	1,43,500
Add: Depreciation	<u>2,00,000</u>	<u>2,50,000</u>
Annual Cash Inflows	<u>3,01,500</u>	<u>3,93,500</u>

Year	P.V. of Re.1 @12%	Machine – I			Machine – II		
		Cash flow	P.V.	Cumulative P.V	Cash flow	P.V.	Cumulative P.V
1	0.893	3,01,500	2,69,240	2,69,240	3,93,500	3,51,396	3,51,396
2	0.797	3,01,500	2,40,296	5,09,536	3,93,500	3,13,620	6,65,016
3	0.712	3,01,500	2,14,668	7,24,204	3,93,500	2,80,172	9,45,188
4	0.636	3,01,500	1,91,754	9,15,958	3,93,500	2,50,266	11,95,454
5	0.567	3,01,500	1,70,951	10,86,909	3,93,500	2,23,115	14,18,569
6	0.507	-	-	-	3,93,500	1,99,505	16,18,074

Discounted Payback Period for:**Machine – I**

$$\begin{aligned}
 \text{Discounted Payback Period} &= 4 + \frac{(10,00,000 - 9,15,958)}{1,70,951} \\
 &= 4 + \frac{84,042}{1,70,951} = 4 + 0.4916 \\
 &= 4.49 \text{ years or 4 years and 5.9 months}
 \end{aligned}$$

Machine – II

$$\begin{aligned}
 \text{Discounted Payback Period} &= 5 + \frac{(15,00,000 - 14,18,569)}{1,99,505} = 5 + \frac{81,431}{1,99,505} \\
 &= 5 + 0.4082 \\
 &= 5.41 \text{ years or 5 years and 4.9 months}
 \end{aligned}$$

Net Present Value for:**Machine – I**

$$\text{NPV} = \text{Rs. } 10,86,909 - 10,00,000 = \text{Rs. } 86,909$$

Machine – II

$$\text{NPV} = \text{Rs. } 16,18,074 - 15,00,000 = \text{Rs. } 1,18,074$$

Internal Rate of Return (IRR) for:**Machine – I**

$$\text{P.V. Factor} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}} = \frac{10,00,000}{3,01,500} = 3.3167$$

PV factor falls between 15% and 16%

Present Value of Cash inflow at 15% and 16% will be:

Present Value at 15% = $3.353 \times 3,01,500 = 10,10,930$

Present Value at 16% = $3.274 \times 3,01,500 = 9,87,111$

$$\text{IRR} = 15 + \frac{10,10,930 - 10,00,000}{10,10,930 - 9,87,111} \times (16 - 15) = 15 + \frac{10,930}{23,819} \times 1$$

$$= 15.4588\%$$

$$= 15.46\%$$

Machine - II

$$\text{P.V. Factor} = \frac{15,00,000}{3,93,500} = 3.8119$$

Present Value of Cash inflow at 14% and 15% will be:

$$\text{Present Value at 14\%} = 3.888 \times 3,93,500 = 15,29,928$$

$$\text{Present Value at 15\%} = 3.785 \times 3,93,500 = 14,89,398$$

$$\text{IRR} = 14 + \frac{15,29,928 - 15,00,000}{15,29,928 - 14,89,398} \times (15 - 14) = 14 + \frac{29,928}{40,530} \times 14.7384\%$$

$$= 14.74\%$$

(ii) Advise to the Management**Ranking of Machines in terms of the Three Methods**

	Machine - I	Machine - II
Discounted Payback Period	I	II
Net Present Value	II	I
Internal Rate of Return	I	II

Advise: Since Machine - I has better ranking than Machine – II, therefore, Machine – I should be selected

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 = $P_0 D1 = \frac{D_1}{K_e - g}$

$$\frac{\text{Rs.}2.16}{0.115 - 0.05} = 20$$

(i) In case the growth rate rises to 8% then the dividend for the current year (D_1) would be Rs.

$$2.16 \text{ and market price would be- } = \frac{\text{Rs.}2.16}{0.115 - 0.08} = \text{Rs. } 28.80$$

(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

$$\frac{\text{Rs.}2.6}{0.115 - 0.03} = 16.48$$

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:

$$= p_0 \frac{1}{1 + k_e} \times (D_1 + P_1)$$

- (i) If the dividend is not declared:

$$100 = \frac{1}{1 + 0.12} = (0 + P_1)$$

$$= 100 = \frac{P_1}{1.12} = P_1 = \text{Rs.}112$$

The Market price of the equity share at the end of the year would be Rs.112.

- (ii) If the dividend is declared:

$$100 = \frac{1}{1 + 0.12} = (0 + P_1)$$

$$100 = \frac{10 + P_1}{1.12} \times (10 + P_1)$$

$$112 = 10 + P_1$$

$$P_1 = 112 - 10 = \text{Rs.}102$$

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 :

$$\text{Earning Per Share (E)} = \frac{\text{Rs.40 Lakhs}}{4,00,000} = \text{Rs. 10}$$

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

$$P = \frac{4 + \frac{0.20}{0.16}(10 - 4)}{0.16} = \frac{4 + 7.5}{0.16} = \text{Rs.}71.88$$

- (ii) **Gordon's formulas** : When the growth is incorporated in earnings and dividend, the present value of market price per share (P_0) is determined as follows

$$\text{Gordon's theory } P_0 = \frac{E(1-b)}{k-br}$$

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)

$$\text{Now } P_0 = \frac{10(1-.60)}{.16 - (.60 \times .20)} = \text{Rs.} \frac{4}{.04} = \text{Rs.}100$$

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:

- Current Market Price of the share
- Capitalization rate of its risk class
- What should be the optimum payout ratio?
- 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:

$$\begin{aligned} \text{Price Earnings (P/E) Ratio} &= \frac{\text{Market Price of Share}}{\text{Earnings Per Shares}} \\ \text{Or, 10} &= \frac{\text{Market Price of Share}}{Rs.10,00,000 / 2,00,000} \\ \text{Or, 10} &= \frac{\text{Market Price of Share}}{Rs.5} \\ \text{Market Price of Share} &= Rs. 50 \end{aligned}$$

(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

$$P = \frac{D + \frac{r}{K_e} (E - D)}{K_e}$$

$$\text{Rs.40} = \frac{D + \frac{0.25}{0.15} (\text{Rs. 4} - D)}{0.15}$$

$$6 = \frac{0.15D + 1 - 0.25D}{0.15}$$

$$0.1 D = 1 - 0.9$$

$$D = \text{Rs.1}$$

$$\text{D/P ratio} = \frac{\text{DPS}}{\text{EPS}} \times 100 = \frac{\text{Rs.1}}{\text{Rs.4}} \times 100 = 25\%$$

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 :

$$\begin{aligned}
 P &= \frac{D_0(1+g)}{K_e - g} \\
 &= \frac{2(1+0.02)}{0.15 - 0.02} = \text{Rs.15.69}
 \end{aligned}$$

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 :

$$\text{Present market price per share } (P_0)^* = \frac{D_0 (1 + g)}{K_e - g}$$

OR

$$\text{Present market price per share } (P_0)^* = \frac{D_1}{K_e - g}$$

Where,

$$\begin{aligned} P_0 &= \text{Present market per share.} \\ g &= \text{Growth rate (br)} = 0.75 \times 0.22 = 0.165 \\ b &= \text{Retention ratio (i.e., \% of earnings retained)} \\ r &= \text{Internal rate of return (IRR)} \\ D_0 &= E \times (1 - b) = 3 \times (1 - 0.75) = 0.75 \\ E &= \text{Earnings per share} \\ P_0 &= \frac{0.75 (1 + 0.165)}{0.18 - 0.165} = \frac{0.874}{0.015} = \text{Rs. 58.27 approx.} \end{aligned}$$

* Alternatively, P_0 can be calculated as $\frac{E(1 - b)}{k - br} = \text{Rs. 50}$

(2) Walter's Model:

$$\begin{aligned} P &= \frac{D + \frac{r}{K_e} (E - D)}{K_e} \\ &= \frac{0.75 + \frac{0.22}{0.18} (3 - 0.75)}{0.18} = \text{Rs. 19.44} \end{aligned}$$

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 $\left(\frac{\text{Earnings for equity shareholders}}{\text{No. of equity shares}} \right)$	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 :

- Determine what would be the market value per share as per Walter's model.
- 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 :

- 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. (K_e)	16%

- COMPUTE the approximate dividend pay-out ratio so as to keep the share price at Rs. 42 by using Walter's model?
- DETERMINE the optimum dividend pay-out ratio and the price of the share at such pay-out.
- 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	$= 45/7.5 = \text{Rs. 6.00}$

- (a) Let, the dividend per share be D to get share price of Rs. 42

$$P = \frac{D + \frac{r}{K_e} (E - D)}{K_e}$$

$$Rs.42 = \frac{D + \frac{0.20}{0.16} (6 - D)}{0.16}$$

$$6.72 = \frac{0.16D + 1.2 - 0.20D}{0.16}$$

$$0.04D = 1.2 \div 1.0752$$

$$D = 3.12$$

$$D / P \text{ ratio} = \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$$

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:

$$P = \frac{D + \frac{r}{K_e} (E - D)}{K_e}$$

$$P = \frac{0 + \frac{0.20}{0.16} (6 - 0)}{0.16} = Rs. 46.875$$

- (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

$$P = \frac{1.5 + \frac{0.20}{0.16} (6 - 1.5)}{0.16} = Rs. 44.531$$

At 50% pay-out ratio

$$P = \frac{3 + \frac{0.20}{0.16} (6 - 3)}{0.16} = Rs. 42.188$$

At 75% pay-out ratio

$$P = \frac{4.5 + \frac{0.20}{0.16} (6 - 4.5)}{0.16} = Rs. 39.844$$

At 100% pay-out ratio

$$P = \frac{6 + \frac{0.20}{0.16} (6 - 6)}{0.16} = Rs. 37.50$$

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 :

$$P_0 = \frac{D}{K_e} = \frac{5}{0.10} = \text{Rs. } 50$$

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:

- Dividend payout ratio.
- Market price of share at optimum dividend payout ratio.
- P/E ratio, at which the dividend policy will have no effect on the price of share.
- Market price of share at this P/E ratio.
- 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:

$$P = \frac{D + \frac{r}{K_e} (E - D)}{K_e} \quad \text{or} \quad P = \frac{D + \frac{12}{8\%} (10 - D)}{8\%}$$

$$\text{or } [D + 1.5(10 - D)] / 0.08 = 130$$

$$\text{or } D + 15 - 1.5D = 10.4$$

$$\text{or } -0.5D = -4.6$$

$$\text{So, } D = \text{Rs. } 9.2$$

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:

$$P = \frac{0 + \frac{12}{8\%} (10 - 0)}{8\%}$$

$$P = \text{Rs. } 187.5$$

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:

$$P = \frac{D + \frac{r}{K_e} (E - D)}{K_e} = \frac{9.2 + \frac{0.12}{0.12} (10 - 9.2)}{0.12} = 83.33$$

- v) Dividend Growth Model applying growth on dividend

$$K_e = 8\%, r = 12\%, D_0 = 9.2, b = 0.08$$

$$g = b \cdot r$$

$$g = 0.08 \times 0.12 = 0.96\%$$

$$D_1 = D_0 (1 + g) = 9.2 (1 + 0.0096) = \text{Rs. } 9.2883$$

$$P = \frac{D_1}{(K_e - g)} = 9.2883 / (0.08 - 0.0096) = 9.2883 / 0.0704 = \text{Rs. } 131.936$$

Alternatively, without applying growth on dividend

$$P = \frac{E(1 - b)}{K_e - b \cdot r} = \frac{10(1 - 0.08)}{0.08 - (0.08 \times 0.12)} = 130.68$$

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

$$= \frac{Rs.120 \times 1.15}{(1 + 0.2)^1} + \frac{Rs.138 \times 1.15}{(1 + 0.2)^2} + \frac{Rs.158 \times 1.15}{(1 + 0.2)^3} + \frac{Rs.182 \times 1.15}{(1 + 0.2)^4} + \frac{Rs.209.88 \times 1.05}{(0.2 + 0.05)} + \frac{1}{(1 + 0.2)^4}$$

$$P = 115 + 110.2 + 105.6 + 101.2 + 708.50 = Rs. 1,140.50$$

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 :

$$(I) \quad \text{Price Per Share (P)} : m \left\{ D + \frac{E}{3} \right\}$$

Where,

m = Multiplier

D = Dividend

E = EPS

$$P = 5 \left\{ 60 \times 0.6 + \frac{60}{3} \right\}$$

$$P = 5 \{ 36 + 20 \} = 280$$

$$(II) \quad D_1 = D_0 + [(EPS \times \text{Target Payout}) - D_0] \times \text{Adjustment factor}$$

$$D_1 = 6.34 + \{(12 \times 60\%) - 6.34\} \times 0.45$$

$$D_1 = 6.34 + 0.387 = 6.727$$

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 $K_e = 18\%$

As per Gordon's model , when $r > K_e$, 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:

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - 1 + E}{(1 + K_e)}$$

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.

$$nP_0 = \frac{(n + \Delta n)P_1 - 1 + E}{(1 + K_e)}$$

$$nP_0 = \frac{(1,00,000 + \frac{2,30,000}{23}) \times \text{Rs. } 23 - \text{Rs. } 7,50,000 + \text{Rs. } 5,20,000}{(1 + 0.15)}$$

$$= \frac{\text{Rs. } 25,30,000 - \text{Rs. } 7,50,000 + \text{Rs. } 5,20,000}{(1 + 0.15)} = \text{Rs. } 20,00,000$$

Working notes:

1. Price of share at the end of the period (P_1)

$$(P_0) = \frac{P_1 + D_1}{1 + K_e}$$

$$20 = \frac{P_1 + 0}{1 + 0.15} \text{ or } P_1 = \text{Rs. } 23$$

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

$$\text{No. of shares } (\Delta n) = \frac{\text{Funds required}}{\text{Price at end } (P_1)} = \frac{2,30,000}{23} \text{ shares}$$

(ii) Value of the ZX Ltd. when dividends are paid.

$$nP_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_0 = \frac{\left(1,00,000 + \frac{4,80,000}{20.5}\right) \times \text{Rs. } 20.5 - \text{Rs. } 7,50,000 + \text{Rs. } 5,20,000}{(1 + 0.15)}$$

$$= \frac{\text{Rs. } 25,30,000 - \text{Rs. } 7,50,000 + \text{Rs. } 5,20,000}{(1 + 0.15)} = \text{Rs. } 20,00,000$$

Working notes:

4. Price of share at the end of the period (P_1)

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$20 = \frac{P_1 + 2.5}{1 + 0.15} \text{ or } P_1 = \text{Rs. } 20.5$$

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

$$\begin{aligned}\text{No. of shares } (\Delta n) &= \frac{\text{Funds required}}{\text{Price at end } (P_1)} = \frac{4,80,000}{20.5} \\ &= 23,415 \text{ shares (approx.)}\end{aligned}$$

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 stabilize 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.

SOLUTION :

As per Dividend discount model, the price of share is calculated as follows:

Retained earning per share = Rs. 3.60

Dividend per share, $D_0 = \frac{\text{Rs.3.60}}{40\%} = \text{Rs.5.40}$

$$P = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \frac{D_3}{(K_e - g)} \times \frac{1}{(1+K_e)^2}$$

Where,

P = Price per share

K_e = Required rate of return on equity

g = Growth rate

$$P = \frac{5.4 \times 1.1}{(1+0.15)^1} + \frac{5.94 \times 1.1}{(1+0.15)^2} + \frac{6.534 \times 1.08}{(0.15-0.08)} \times \frac{1}{(1+0.15)^2}$$

$$P = 5.17 + 4.94 + 76.23 = \text{Rs.86.33}$$

Intrinsic value of share is Rs. 86.33

QUESTION 18 : RTP - SEPT 2024

The following information is taken from Gamma 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:

- (1) Gordon's Model
- (2) Walter's Model

SOLUTION :**Market price per share by-****(1) Gordon's Model:**

$$\text{Present market price per share } (P_0)^* = \frac{D_0(1+g)}{K_e - g}$$

OR

$$\text{Present market price per share } (P_0) = \frac{D_1}{K_e - g}$$

Where,

 P_0 = Present market price per share. g = Growth rate (br) = $0.75 \times 0.22 = 0.165$ b = Retention ratio (i.e., % of earnings retained) r = Internal rate of return (IRR) E = Earning per share

$$P_0 = \frac{0.75(1+0.165)}{0.18-0.165} = \frac{0.874}{0.015} = \text{Rs.58.27 approx.}$$

(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 (Rs.)
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	Rs.
$\left(\frac{\text{Earning for equity shareholders}}{\text{No. of equity shares}} \right)$	$18,00,000/6,00,000$
	= Rs.30

2. Calculation of Dividend per share (D0)

Particulars	
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)	$\text{Rs. 3} \times 0.25 = \text{Rs. 0.75}$

QUESTION 19 : PAPER - SEPT 2024

List any four assumptions of Gordon's Model.

SOLUTION :

Gordon's model is based on the following assumptions:

- Firm is an all equity firm i.e. no debt.
- IRR will remain constant, because change in IRR will change the growth rate and consequently the value will be affected. Hence this assumption is necessary.
- K_e will remain constant, because change in discount rate will affect the present value.
- Retention ratio (b), once decided upon, is constant i.e. constant dividend payout ratio will be followed.
- Growth rate ($g = br$) is also constant, since retention ratio and IRR will remain unchanged and growth, which is the function of these two variables will remain unaffected.
- $K_e > g$, this assumption is necessary and based on the principles of series of sum of geometric progression for 'n' number of years.
- All investment proposals of the firm are to be financed through retained earnings only.

QUESTION 20 : RTP - JAN 2025

The following information is supplied to you:

Particulars	Amount (Rs.)
Total Earnings	4,50,000
No of Equity Shares (of Rs. 100 each)	25,000 shares
Retention ratio	40%
MPS	198

Applying Walter's Model:

- ANALYSE whether the company is following an optimal dividend policy.
- COMPUTE P/E ratio at which the dividend policy will have no effect on the value of the share. Also calculate the MPS at such P/E ratio
- Will your decision change if the P/E ratio is 4.5? ANALYSE.

SOLUTION :

(i) **As per Walter,**

If $ROI > K_e$, firm should retain everything and distribute nothing to maximize the share price. On the contrary, if $ROI < K_e$, firm should distribute everything and retain nothing to maximize the wealth of the equity owners.

$$ROI = \frac{\text{Total Earnings}}{\text{Equity Share capital}} = \frac{4,50,000}{25,00,000}$$

$$ROI = 18\%$$

$$K_e = \frac{1}{PE}$$

$$P.E \text{ Ratio} = MPS / EPS = 198 / 18 = 11$$

$$\text{Therefore } K_e = 1/11 = 9.091\%$$

Since $ROI > K_e$, optimal dividend policy of the firm should be to retain everything and distribute nothing. However, the firm has retained 40% and distributed 60%, hence it is not having an optimal dividend policy as per Walter's model.

- (ii) **When $ROI = K_e$, dividend policy of the company will have no effect on the value of the share as per Walter's model**

Therefore, in that case, K_e should be equal to 18%

$$P.E \text{ Ratio} = \frac{1}{K_e} = \frac{1}{0.18}$$

P.E Ratio = 5.56 times

MPS at the above P.E Ratio = $18 \times 5.56 = \text{Rs. } 100.08$

- (iii) **If P.E Ratio is 4.5,**

$$K_e = \frac{1}{4.5} = 22.22\%$$

Since, $ROI < K_e$, optimal dividend policy of the firm should be to distribute everything and retain nothing, as the value of share would be maximum at that point thereby maximizing the wealth of the shareholder

QUESTION 21 : PAPER - JAN 2025

Following information have been provided by LP Ltd.:

Profit before Tax	Rs. 40 Lakh
Tax Rate	30%
Equity Share Capital (Rs. 10)	Rs. 40 Lakh
Return on Investment	18%
Cost of Equity	15%
Dividend Payout Ratio	50%

You are required:

- to determine the price of Equity Share of the company as per Walter's Model;
- to determine the Dividend Pay-out Ratio by applying Walter's Model assuming the price of equity share of the company is Rs. 48.

SOLUTION :

- (i) **Price per share as per Walter's Model**

	Rs. in lakhs
Profit before tax	40
Less: tax @ 30%	12
Earning for equity shareholders	28
Earning per share	$28/4 = \text{Rs. } 7$

$$P = \frac{D + \frac{r}{K_e}(E-D)}{K_e}$$

Where,

P = Market Price of the share.

E = Earnings per share. = Rs. 7

D = Dividend per share. = Rs. 3.5

K_e = Cost of equity/ rate of capitalization/ discount rate. = 15%

r = Internal rate of return/ return on investment = 18%

Applying the above formula, price per share

$$P = \frac{3.5 + \frac{0.18}{0.15}(7 - 3.5)}{0.15}$$

$$\text{Or, } P = \frac{3.5 + 4.2}{0.15} = \text{Rs.51.33}$$

(ii) Let, the dividend per share be D to get share price of Rs. 48

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$\text{Rs.48} = \frac{D + \frac{0.18}{0.15}(7 - D)}{0.15}$$

$$7.2 = \frac{0.15D + 1.26 - 0.18D}{0.15}$$

$$0.03D = 1.26 - 1.08$$

$$D = \text{Rs.6}$$

$$D/P \text{ ratio} = \frac{\text{DPS}}{\text{EPS}} \times 100 = \frac{6}{7} \times 100 = 85.714\%$$

QUESTION 22 : RTP - MAY 2025

Mr. A had gathered the following information for his analysis –

- (A) A Company pays regular dividend on quarterly basis and the last interim dividend declared for the quarter was Rs. 3 per share
- (B) Owing to a wide market reach and presence, company's turnover has seen an annual compounded growth of 25% (CAGR) in the last 5 years and the turnover is expected to grow at the same rate in the future as well. The company expects the following Rate of Return (ROI) against the probabilities of likely achievement mentioned along with in different situations.

Scenario	ROI	Probability
I	20%	0.30
II	15%	0.60
III	12%	0.50

- (C) The retention ratio over the last 5 years has been 40%, 65%, 50%, 45%, 30% respectively and company plans to retain based on the past average.
- (D) The current interest rate on GOI Treasury bond is at 4.5% and the beta of the company is 1.3 and a market return of 12.5%

You are required to CALCULATE the theoretical market price of the company's share for Mr. A's decision-making using Gordon's model and Walter's model.

SOLUTION :

Calculation of the theoretical price (intrinsic price) denoted by 'Po' using Gordon's formula

$$P_0 = \frac{D_1}{K_e - g}$$

So we need to calculate 3 variables i.e g, D1 & Ke

(A) $g = \text{Retention Ratio} \times \text{ROI}$
 Retention ratio $= \frac{40 + 65 + 50 + 45 + 30}{5}$
 $= 0.46$

Scenario	ROI	Probability	Expected ROI
I	20%	0.30	$20 \times 0.3 = 6$
II	15%	0.60	$15 \times 0.6 = 9$
III	12%	0.50	$12 \times 0.5 = 6$
			Expected ROI = 21%

Therefore $g = 0.46 \times 21 = 9.66\%$

(B) $D_1 = D_0 + g$
 $D_0 = \text{Rs. 3 per quarter} \times 4$
 $= \text{Rs. 12 (Annually)}$
 Therefore $D_1 = 12 + 9.66\%$
 $= \text{Rs. 13.16}$

(C) Ke will be calculated using CAPM Model and as per CAPM
 $K_e = R_f + (R_m - R_f) \times \text{Beta}$
 $= 4.5 + (12.5 - 4.5) \times 1.3$
 $= 14.9\%$

$$P_0 = \frac{13.16}{0.149 - 0.0966}$$

Calculation of the theoretical price (intrinsic price) denoted by 'Po' using Walter's formula

As per Walter $P = \frac{D + \frac{r}{k_e}(E - D)}{K_e}$

Where 'D' is constant, so no growth would be added

EPS $= \text{Dividend} / (1 - \text{Retention ratio})$
 $= 12 / (1 - 0.46)$
 $= \text{Rs. 22.22}$

$$P = \frac{12 + \frac{0.21}{0.149}(22.22 - 12)}{0.149}$$

Po = Rs. 177.21

QUESTION 23 : PAPER - MAY 2025

Y Ltd. produces energy drinks in different flavours. Due to high demand of its product, the rate of return on its earnings is 25%. Currently, the company retains 60% of its earnings and distributes the rest. The current P/E ratio is 8 and earnings per share is Rs. 10.

According to Gordon's Model:

- (i) What will be retention ratio if the company wants to maintain its P/E ratio to 12 in current year, given that the expected rate of return for an investor is 20%?
- (ii) What will be the expected price per share after one year if Y Ltd. achieves above-mentioned targeted P/E ratio?
- (iii) Will there be any change in retention ratio if the company wants to maintain its P/E ratio to 10 in current year, given that the expected rate of return for an investor is 17.50%?

SOLUTION :

The question can be solved with the help of Justified P/E Ratio linked to Gordon Growth Model.

(i) Calculation of Retention Ratio

$$P/E = \frac{1-b}{K_e - br}$$

$$12 = \frac{1-b}{0.20 - 0.25b}$$

$$\text{Or } 2.4 - 3b = 1 - b$$

$$\text{Or } 2.4 - 1 = 3b - b$$

$$\text{Or } 2b = 1.4$$

$$\text{Or } b = 0.70 \text{ or } 70\%$$

So, Retention Ratio is 70%, if the company wants to maintain its P/E ratio to 12 in the current year.

(ii) Calculation of Expected Price Per Share

$$P/E = \frac{\text{Market Price Share}}{\text{Earnings Per Share}}$$

P/E Ratio is 12 and EPS is Rs. 10

$$\begin{aligned} \text{So, Market Price Share} &= P/E \text{ Ratio} \times \text{Earning Per Share} \\ &= 12 \times 10 = \text{Rs. } 120 \end{aligned}$$

Retention Ratio is 70%, when P/E ratio is 12, Return on Earnings is 25%

So, New growth rate = $0.70 \times 0.25 = 0.175 = 17.5\%$

Expected price after one year = ₹ 120 X (1+17.5%) = Rs. 141

Therefore, the expected price per share after one year is Rs. 141 if Y Ltd. achieves the targeted P/E ratio of 12.

(iii) Calculation of change in Retention Ratio

$$P/E = \frac{1-b}{K_e - br}$$

$$10 = \frac{1-b}{0.175 - 0.25b}$$

$$1.75 - 2.5b = 1 - b$$

$$1.75 - 1 = 2.5b - b$$

$$1.5b = 0.75$$

$$b = \frac{0.75}{1.5} = 0.5 \text{ or } 50\%$$

So, Retention Ratio is 50%, if the company wants to maintain its P/E ratio to 10 in the current year.

QUESTION 24 : PAPER - MAY 2025

Following details are related to H Ltd.:

EPS	Rs. 3.00
Return on investment	20%
Cost of equity	15%

As per Walter's Model, what would be the maximum and minimum price of share?

SOLUTION :

In this question, since $r > K_e$, as per the Walter's Model, the price will be maximum when the company retains all the earnings. Detailed calculations are as follows:

(i) **Maximum Price when company retains all the earnings i.e. $D = 0$**

$$P_0 = \frac{D + \frac{r}{K_e}(E - d)}{K_e}$$

$$= \frac{0 + \frac{0.20}{0.15}(3 - 0)}{0.15} = \frac{(1.333) \times 3}{0.15} = \frac{4}{0.15}$$

$$= \text{Rs. } 26.67$$

(ii) **Minimum Price is when company distributes all its earnings**

$$P_0 = \frac{3 + \frac{0.20}{0.15}(3 - 3)}{0.15} = \frac{3 + 0}{0.15} = \frac{3}{0.15} = \text{Rs. } 20$$

QUESTION 25 : RTP - SEPT 2025

In the month of April of the current Financial Year, shares of PQR Ltd. were sold for Rs. 1,570 per share. A long-term earnings growth rate of 8% is anticipated. PQR Ltd. paid dividend of Rs. 25 per share.

- CALCULATE rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 8% per year in perpetuity.
- It is expected that PQR Ltd. will earn about 10% on retained earnings and shall retain 60% of earnings. In this case, STATE whether, there would be any change in growth rate and cost of Equity?

SOLUTION :

(i) According to Dividend Discount Model approach, the firm's expected or required return on equity is computed as follows:

$$K_e = \frac{D_1}{P_0} + g$$

$$K_e = \frac{25(1+0.08)}{1,570} + 0.08$$

$$= 0.0172 + 0.08 = 0.0972 \text{ or } 9.72\%$$

- (ii) With rate of return on retained earnings (r) is 10% and retention ratio (b) is 60%, new growth rate will be as follows:

$$g = br = 0.10 \times 0.60 = 0.06$$

Accordingly, dividend will also get changed and to calculate this, first we shall calculate previous retention ratio (b₁) and then EPS assuming that rate of return on retained earnings (r) is same.

With previous Growth Rate of 8% and r = 10%, the retention ratio comes out to be:

$$0.08 = b_1 \times 0.10$$

$$b_1 = 0.80. \text{ So, payout ratio} = 0.20$$

With 0.20 payout ratio the EPS will be as follows:

$$\frac{\text{Rs.}25}{0.20} = \text{Rs.}125$$

With new 0.40 (1 – 0.60) payout ratio, the new dividend will be

$$D_1 = \text{Rs. } 125 \times 0.40 = \text{Rs. } 50$$

Accordingly, new K_e will be

$$K_e = \frac{50}{1,570} + 0.06$$

$$\text{or, } K_e = 9.18\%$$

QUESTION 26 : PAPER - SEPT 2025

Saraswati Ltd. has started its business a year back with a paid-up equity capital of Rs. 50,00,000. The other details are as under:

Earnings of company	Rs. 5,00,000
Cost of Capital	Rs. 159.09
Market price per share using Gordon's Model	8%
Internal rate of return on investment	12%
Number of shares	50,000

You are required to:

- Calculate the Dividend paid per share using Gordon's Model.
- What will be Optimum dividend pay-out ratio according to Gordon's Model when $r = K_e$?

SOLUTION :

$$\begin{aligned}
 \text{(i)} \quad P_0 &= \frac{E(1-b)}{K_e - br} \\
 159.09 &= \frac{10(1-b)}{0.08 - 0.12b} \\
 159.09(0.08 - 0.12b) &= 10(1-b) \\
 12.7272 - 10 &= 19.0908b - 10b \\
 2.7272 &= 9.0908b \\
 B \text{ (retained earning ratio)} &= 0.30
 \end{aligned}$$

Dividend payout ratio= (1-b) = 0.70

Dividend per share = EPS x (1-b) = 10×0.70 = Rs. 7

(ii) When r = Ke, There is no optimum ratio

QUESTION 27 : RTP - JAN 2026

For the year ending 31.03.2025, ABC Industries Ltd declared 40% dividend. The current market price of the share is quoted at Rs. 57.50. If the retention ratio is reduced by 20 percent, the market price dropped by Rs. 2.50. Face value of the shares is Rs. 10 per share.

- Find the return on investment and cost of equity using walter's model.
- Comment on the dividend policy adopted by the company.
- Find the limiting value of shares using walter's model.
- Also find the intrinsic value of the shares under Gordon's Model.
- Mr. X, the chief financial officer of the company, opines that the return on investment of the company is not having direct / indirect effect on the intrinsic value of the shares under Gordon's Model. Only cost of equity will be considered for the computation of the intrinsic value of the shares under Gordon's Model.

SOLUTION :

$$1. \quad \text{Price under Walter's Model (P)} = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

		Situation 1	Situation 2
1	DP Ratio	40%	60%
2	Retention Ratio	60%	60% - 20% = 40%
3	Dividend per share = D	Rs. 4	Rs. 6
4	Retention per share = (E-D)	Rs. 6	Rs. 4
5	Market price per share = MPS	Rs. 57.50	Rs. 57.50 – Rs. 2.50 = Rs. 55
6	Equation = Let r/ke be y & Ke be x.	4 + 6y = 57.50x	6 + 4y = 55x
7	Equation for solving	57.50x – 6y = 4	55x – 4y = 6

Equation 1 * 4 = 230x – 24y = 16(1)

Equation 2 * 6 = 330x – 24y = 36(2)

By solving, we get x = 20% and y = 1.25.

$$y = \frac{r}{K_e} = 1.25$$

$$\frac{r}{20\%} = 1.25$$

Hence, r = 25%

- Since r 25% > ke 20%, the company should retain 100%. Since the company pays 40% Dividend, the company is not following optimum dividend policy.

3.

		Situation 1	Situation 2

1	DP Ratio	0%	100%
2	Retention Ratio	100%	0%
3	Dividend per share = D	Rs. 0	Rs. 10
4	Retention per share = (E-D)	Rs. 10	Rs. 0
5	Market price per share = MPS	$\frac{10 \times 1.25}{0.2} = 62.50$	$\frac{10}{0.2} = 50$

4. Price under Gordon's Model

$$\text{Market price per share}(P_0) = \left[\frac{D_0(1 + g)}{K_e - g} \right]$$

		Situation 1	Situation 2
1	Dividend paid	Rs. 4	Rs. 6
2	Retention Ratio (b)	60%	40%
3	Return on investment (r)	25%	25%
4	Growth = g = br	15%	10%
5	Market price per share = MPS	$\frac{4(1+0.15)}{0.2-0.15} = \text{Rs.92}$	$\frac{6(1+0.10)}{0.2-0.1} = \text{Rs.66}$

5. Since, return on investment is used for computing growth rate, both cost of equity and return on investment are considered for computing price under Gordons model. Hence, the opinion of the chief financial officer is not valid.

QUESTION 28 : PAPER - JAN 2026

PQR Ltd. is a leading company operating in the coal sector, engaged in the extraction, processing, and distribution of coal for industrial and energy purposes.

The following information is provided by the management of PQR Ltd.

Particulars	
Issued Share Capital	Rs. 24,00,000
Dividend Paid	10 per Share
Growth Rate	20% p.a. in perpetuity
Cost of Equity (Ke)	25%

You are required to calculate:

- (i) Using Gordon Model:
 - (a) The current market price of the share.
 - (b) Number of issued shares, if market price per share (MPS) is equal to face value per share.
- (ii) Using Modigliani and Miller (MM) Hypothesis:
 - (a) The market price of the share at the end of year if dividend is paid. Use the current market price calculated in Gordon model as P_0 .
 - (b) What will be the amount of earnings required for the company so that the MM hypothesis holds true, if the company has made new investments of Rs. 5,00,000 during the period and issued 1,000 new equity shares?

SOLUTION :

$$(i) \quad (a) \quad P_0 = \frac{E_1(1-b)}{K_e - br} = \frac{D_1}{K_e - g}$$

$$D_0 = 10$$

$$K_e = 25\%$$

$$g = 20\%$$

$$P_0 = \frac{10(1+0.20)}{0.25-0.20} = 240$$

$$(b) \quad \text{Number of Shares} = \frac{24,00,000}{240} = 10,000 \text{ shares}$$

(ii) (a) As per MM Hypothesis,

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$240 = \frac{P_1 + 12}{1 + 0.25}$$

$$P_1 = 288$$

(b) **Calculation of Amount of earning required**

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 + I + E}{(1 + K_e)}$$

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

$$24,00,000 = \frac{[(10,000 + 1,000) \times \text{Rs.}288] - \text{Rs.}5,00,000 + E}{(1 + 0.25)}$$

$$30,00,000 = 26,68,000 + E$$

Amount of earnings required (E) = Rs. 3,32,000

QUESTION 29 : PAPER - MAY 2026

K Ltd. provides the following information:

Net profit	Rs. 50,00,000
10% Preference share capital @ Rs.100 each	Rs. 2,00,00,000
Number of equity share outstanding	5,00,000
Rate of return on investment	25%
Cost of equity	15%

You are required to:

- Calculate EPS and also calculate market price per equity share as per Walter's Model with the retention ratio of 20%.
- If the company aims to keep the market price of its equity share at Rs. 60 each, what retention ratio should be adopted?

(iii) What would be optimum dividend payout ratio as per Gordon's Model?

SOLUTION :

	(Rs.) in lakhs
Net Profit	50
Less: Preference dividend	20
Earning for equity shareholders	30

(i) Earning per share = $30,00,000/5,00,000 = \text{Rs. } 6.00$

Market Price as per Walters model

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$P = \frac{4.8 + \frac{0.25}{0.15}(6 - 4.8)}{0.15}$$

$$P = \text{Rs. } 45.33$$

(ii) Retention ratio when market price is Rs. 60 each

Let, the dividend per share be D to get share price of 60

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$\text{Or } 60 = \frac{D + \frac{0.25}{0.15}(6 - D)}{0.15}$$

$$\text{Or } 9 = \frac{0.15D + 1.5 - 0.25D}{0.15}$$

$$\text{Or } 1.35 = 0.15D + 1.5 - 0.25D$$

$$\text{Or } 0.10D = 0.15$$

$$D = \text{Rs. } 1.50$$

Retention ratio = $4.5/6 = 0.75 = 75\%$

(iii) As per Gordon's model, when $r > K_e$, optimum dividend payout ratio is 'Zero'.

QUESTION 30 : RTP - SEPT 2026

The stocks of Firms A and B are considered to be equally risky. Investors expect the share of Firm A, which does not intend to pay any dividend, to be worth Rs. 100 one year from now.

Similarly, investors expect a total payoff of Rs. 100 from the share of Firm B after one year, comprising Rs. 10 as dividend income and Rs. 90 as the expected share price.

Dividends are taxed at 25 percent, while capital gains are taxed at 12 percent.

Assuming that each stock is expected to provide a post-tax rate of return of 18 percent and that the radical position holds, determine the current market prices of the shares of Firms A and B.

SOLUTION :

	A	B
Next year's price	100	90
Dividend	0	10
Let the current price be	A	B
Post-tax capital appreciation	$0.88(100-A)$	$0.88(90-B)$
Post-tax dividend income	0	0.75×10
Total return	$\frac{0.88(100-A)}{A}$	$\frac{0.88(90-B)+7.5}{B}$
	= 18%	= 18%
Current price (obtained by solving the preceding equation)	A = Rs. 83.02	B = Rs. 81.79

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 × Rs. 40)}	17,28,000
Direct wages {(31,200 × Rs. 15) +(12,000 × Rs. 15 × 0.5)}	5,58,000
Overheads (exclusive of depreciation) {(31,200 × Rs. 30) + (12,000 × Rs. 30 × 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) × (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

$$\text{Raw material stock} = \frac{\text{Rs.17,28,000}}{360\text{days}} \times 30 \text{ days} = \text{Rs.1,44,000}$$

(iv) Finished goods stock:

$$24,000 \text{ units @ Rs. (40 + 15 + 30) per unit} = \text{Rs.20,40,000}$$

$$\text{(v) Debtors for sale: Rs.6,12,000} \times \frac{60\text{days}}{360\text{days}} = \text{Rs.1,02,000}$$

(vi) Creditors for raw material Purchases [Working Note (iii)]:

$$\text{Annual Material Consumed (Rs.12,48,000 + Rs.4,80,000)} \quad \text{Rs.17,28,000}$$

$$\text{Add: Closing stock of raw material [(Rs.17,28,000} \times 30 \text{ days) / 360 days]} \quad \text{Rs. 1,44,000}$$

$$\text{Rs.18,72,000}$$

$$\text{Credit allowed by suppliers} = \frac{\text{Rs.18,72,000}}{360\text{days}} \times 30 \text{ days} = \text{Rs. 1,56,000}$$

(vii) Creditors for wages:

$$\text{Outstanding wage payment} = [(31,200 \text{ units} \times \text{Rs. 15}) + (12,000 \text{ units} \times \text{Rs. 15} \times .50)] \times 15 \text{ days} / 360 \text{ days}$$

$$= \frac{\text{Rs.5,58,000}}{360\text{days}} \times 15 \text{ days} = \text{Rs. 23,250}$$

QUESTION 2 : MAY 2019

Bita Ltd manufactures used in the steel industry. The following information regarding the company is given for your consideration:

- Expected level of production 9000 units per annum
- Raw materials are expected to remain in store for an average of two months before issue to production
- Work-in-progress (50 percent complete as to conversion cost) will approximate to ½ month's production
- Finished goods remain in warehouse on an average for one month
- Credit allowed by suppliers in one month.
- Two month's credit is normally allowed to debtors
- A minimum cash balance of Rs. 67,500 is expected to be maintained
- Cash sales are 75 percent less than the credit sales
- Safety margin of 20 percent to cover unforeseen contingencies
- The production pattern is assumed to be even during the year.
- 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 Bitu Limited

SOLUTION :

Statement showing Estimate of Working Capital Requirement

	(Amount In Rs)	(Amount in Rs)
A. Current Assets		
(i) Inventories :		
-		1,20,000
Raw material inventory $\left(\frac{9,000 \text{ units} \times \text{Rs. } 80}{12 \text{ months}} \times 2 \text{ months} \right)$		
- Work in Progress:		
Raw material inventory $\left(\frac{9,000 \text{ units} \times \text{Rs. } 80}{12 \text{ months}} \times 0.5 \text{ months} \right)$	30,000	
Wages $\left(\frac{9,000 \text{ units} \times \text{Rs. } 20}{12 \text{ months}} \times 0.5 \text{ months} \right) \times 50\%$	3,750	
Overheads $\left(\frac{9,000 \text{ units} \times \text{Rs. } 60}{12 \text{ months}} \times 0.5 \text{ months} \right) \times 50\%$ (Other than Depreciation)	11,250	45,000
Finished goods (inventory held for 1 months)		1,20,000
(ii) Debtors (for 2 months) $\left(\frac{9,000 \text{ units} \times \text{Rs. } 160}{12 \text{ months}} \times 2 \text{ month} \right) \times 80\%$ or $\left(\frac{11,52,000}{12 \text{ months}} \times 2 \text{ month} \right)$		1,92,000
(iii) Cash balance expected		67,500
Total Current assets		5,44,500
B. Current Liabilities		
(i) Creditors for Raw material (1month) $\left(\frac{9,000 \text{ units} \times \text{Rs. } 80}{12 \text{ months}} \times 1 \text{ month} \right)$		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

- If Credit Sales is x then cash sales is x-75% of x i.e. x/4.
 Or $x + 0.25x = \text{Rs. } 18,00,000$
 Or $x = \text{Rs. } 14,40,000$
 So, credit Sales is Rs. 14,40,000
 Hence, Cash cost of credit sales $\left(\frac{\text{Rs. } 14,40,000}{5} \times 4 \right) = \text{Rs. } 11,52,000$

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

$$\left(\frac{9,000 \text{ units} \times \text{Rs. } 200}{12 \text{ months}} \times 2 \text{ month} \right) \times 80\% \text{ or } \left(\frac{14,40,000}{12 \text{ months}} \times 2 \text{ month} \right) = \text{Rs. } 2,40,000$$
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 (Including Depreciation of Rs. 2,50,000)	Rs. 25,00,000

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:**

$$\begin{aligned}\text{Operating Cycle Period} &= R + W + F + D - C \\ &= 45 + 20 + 25 + 30 - 60 = \mathbf{60 \text{ days}}\end{aligned}$$

(ii) Number of Operating Cycle in a Year

$$= \frac{360}{\text{Operating cycle period}} = \frac{360}{60} = 6$$

(iii) Amount of Working Capital Required

$$\begin{aligned}&= \frac{\text{Annual operating cost}}{\text{Number of operating cycle}} = \frac{\text{Rs. } 25,00,000 - \text{Rs. } 2,50,000}{6} \\ &= \frac{\text{Rs. } 22,50,000}{6} = \text{Rs. } 3,75,000\end{aligned}$$

(iv) Reduction in Working Capital

$$\begin{aligned}\text{Operating Cycle Period} &= R + W + F + D - C \\ &= 45 + 20 + 25 - 60 = 30 \text{ Days}\end{aligned}$$

$$\text{Amount of Working Capital Required} = \frac{\text{Rs. } 22,50,000}{360} \times 30 = \text{Rs. } 1,87,500$$

$$\text{Reduction in Working Capital} = \text{Rs. } 3,75,000 - \text{Rs. } 1,87,500 = \text{Rs. } 1,87,500$$

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 :

$$\text{Current Assets} = 150 + 100 + 50 + 125 + 55 = \text{Rs. } 480 \text{ Lakhs}$$

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	-	<u>Rs. 60</u>
Total cost	-	Rs. 250
Profit	-	<u>Rs. 50</u>
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 in 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) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs.}150}{12 \text{ months}} \times 2 \text{ months} \right\}$	3,75,000	

	WIP Inventory (3 months) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 250}{12 \text{ months}} \times 3 \text{ months} \right\} \times 0.75$	7,03,125	
	Finished goods inventory (1 months) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 250}{12 \text{ months}} \times 1 \text{ months} \right\}$	3,12,500	13,90,625
(ii)	Receivable (debtors) (2 months) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 250}{12 \text{ months}} \times 2 \text{ months} \right\} \times 0.75$		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) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 150}{12 \text{ months}} \times 1.5 \text{ months} \right\}$		2,81,250
(ii)	Outstanding wages (1 months) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 40}{12 \text{ months}} \times 1 \text{ months} \right\}$		50,000
(iii)	Outstanding overheads (1.5 months) $\left\{ \frac{15,000 \text{ unit} \times \text{Rs. } 60}{12 \text{ months}} \times 1.5 \text{ months} \right\}$		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)	<u>2,00,000</u>	<u>3,00,000</u>
	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)	<u>1,30,000</u>	<u>2,02,000</u>
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)	4,01,083	1,92,611
- Work In Process (Refer working note 5)	2,68,500	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 $\left(\frac{\text{Rs. 24,06,500} \times 2,000}{12,000} \right)$ $\left(\frac{\text{Rs. 34,67,000} \times 1,000}{18,000} \right)$	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) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 200}{52 \text{ weeks}} \times 4 \text{ weeks} \right]$	40,00,000	
WIP Inventory (1 week) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 425}{52 \text{ weeks}} \times 1 \text{ weeks} \right] \times 0.8$	17,00,000	
Finished goods inventory (2 weeks)	42,50,000	99,50,000

$\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 425}{52 \text{ weeks}} \times 2 \text{ weeks} \right]$		
(ii) Receivables (Debtors) (4 weeks) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 425}{52 \text{ weeks}} \times 2 \text{ weeks} \right] \times \frac{4}{5^{\text{th}}}$		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) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 200}{52 \text{ weeks}} \times 3 \text{ weeks} \right]$		30,00,000
(ii) Outstanding wages (1 week) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 75}{52 \text{ weeks}} \times 1 \text{ weeks} \right]$		3,75,000
(iii) Outstanding overheads (2 weeks) $\left[\frac{2,60,000 \text{ units} \times \text{Rs. } 150}{52 \text{ weeks}} \times 2 \text{ weeks} \right]$		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:

- Net operating cycle period.
- Number of operating cycles in the year.
- Amount of working capital requirement.

SOLUTION :**Working Notes:****1. Raw Material Storage Period (R)**

$$= \frac{\text{Average stock of Raw Material}}{\text{Annual Consumption of Raw Material}} \times 365$$

$$= \frac{\text{Rs. 585} + \text{Rs. 845}}{2} \times 365 = 53 \text{ days}$$

$$\text{Annual Consumption of Raw Material} = \text{Opening Stock} + \text{Purchases} - \text{Closing Stock}$$

$$= \text{Rs. 585} + \text{Rs. 5,200} - \text{Rs. 845} = \text{Rs. 4,940 lakh}$$

2. Work - in - Progress (WIP) Conversion Period (W)

$$= \frac{\text{Average stock of WIP}}{\text{Annual Cost of Production}} \times 365$$

$$= \frac{\text{Rs. 455} + \text{Rs. 663}}{2} \times 365 = 35 \text{ days}$$

3. Finished Stock Storage Period (F)

$$= \frac{\text{Average stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 365$$

$$= \frac{\text{Rs. 780} + \text{Rs. 910}}{2} \times 365 = 45 \text{ days}$$

4. Receivables (Debtors) Collection Period (D)

$$= \frac{\text{Average Receivables}}{\text{Annual Credit Sales}} \times 365$$

$$= \frac{\text{Rs. 1,456} + \text{Rs. 1,755}}{2} \times 365 = 77 \text{ days}$$

5. Payables (Creditors) Payment Period (C)

$$= \frac{\text{Average Payables for Materials}}{\text{Annual Credit Purchases}} \times 365$$

$$= \frac{\text{Rs. 883} + \text{Rs. 923}}{2} \times 365 = 64 \text{ days}$$

(i) Net Operating Cycle Period

$$= R + W + F + D - C$$

$$= 53 + 35 + 45 + 77 - 64 = 146 \text{ days}$$

(ii) Number of Operating Cycles in the Year

$$= \frac{365}{\text{Operating Cycle Period}} = \frac{365}{146} = 2.5 \text{ times}$$

(iii) Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{Rs. 4,225}}{2.5} = \text{Rs. 1,690 Lakh}$$

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 Shareholders' 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 '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 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 × Rs. 40)}	17,28,000
wages {(31,200 × Rs. 15) + (12,000 × Rs. 15 × 0.5)}	5,58,000

Overheads (exclusive of depreciation) {(31,200 × Rs. 30) + (12,000 × Rs. 30 × 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) × (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

$$\text{Raw material stock} = \frac{\text{Rs. } 17,28,000}{360 \text{ days}} \times 30 \text{ days} = \text{Rs. } 1,44,000$$

(iv) Finished goods stock:

24,000 units @ Rs. (40+15+30) per unit = Rs. 20,40,000

$$\text{Debtors for sale: Rs. } 6,12,000 \times \frac{60 \text{ days}}{360 \text{ days}} = \text{Rs. } 1,02,000$$

(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 × 30 days) / 360 days]	Rs. 1,44,000

$$\text{Credit allowed by suppliers} = \frac{\text{Rs. } 18,72,000}{360 \text{ days}} \times 30 \text{ days} = \text{Rs. } 1,56,000$$

(vi) Creditors for wages:

Outstanding wage payment = [(31,200 units × Rs. 15) + (12,000 units × Rs. 15 × .50)] × 15 days / 360 days

$$= \frac{\text{Rs. } 5,58,000}{360 \text{ days}} \times 15 \text{ days} = \text{Rs. } 23,250$$

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:

- Receivables are allowed 3 months' credit.
- Raw Material Supplier extends 3 months' credit.
- Lag in payment of Labour is 1 month.
- Manufacturing Overhead are paid one month in arrears.
- Administrative & Selling Overhead is paid 1-month advance.
- Inventory holding period of Raw Material & Finished Goods are of 3 months.
- Work-in-Progress is Nil.
- PK Ltd. sells goods at Cost plus 33s%.
- Cash Balance Rs. 3,00,000.
- 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.

QUESTION 13 : RTP – SEPT 2024

TMT Limited is commencing a new project for manufacture of electric toys. The following cost information has been ascertained for annual production of 60,000 units at full capacity:

		Amount per unit (Rs.)
Raw materials		20
Direct labour		15
Manufacturing overheads:		
	Rs.	
Variable	15	
Fixed	<u>10</u>	25
Selling and Distribution overheads:		
	Rs.	
Variable	3	
Fixed	<u>1</u>	<u>4</u>
Total cost		64
Profit		<u>16</u>
Selling price		<u>80</u>

In the first year of operations expected production and sales are 40,000 units and 35,000 units respectively. To assess the need of working capital, the following additional information is available:

- Stock of Raw materials 3 months consumption.
- Credit allowable for debtors 1½ months.
- Credit allowable by creditors 4 months.
- Lag in payment of wages 1 month.
- Lag in payment of overheads ½ month.

- (vi) Cash in hand and Bank is expected to be Rs. 60,000.
 (vii) Provision for contingencies is required @ 10% of working capital requirement including that provision.

You are required to PREPARE a projected statement of working capital requirement for the first year of operations. Debtors are taken at cost.

SOLUTION :

Statement Showing Cost and Sales for the First Year

Annual Production Capacity	60,000 units
Production	40,000 units
Sales	35,000 units

Particulars	Rs.
Sales Revenue (Rs. 80 × 35,000)	28,00,000
Cost of Production:	
Materials @ Rs. 20 per unit	8,00,000
Direct Labour @ Rs. 15 per unit	6,00,000
Manufacturing Overheads	
Variable @ Rs. 15 per unit	6,00,000
Fixed (based on production capacity 60,000 units × Rs. 10)	<u>6,00,000</u>
Cost of Production	26,00,000
Less: Closing Stock (40,000 – 35,000 = 5,000 units)	
$\left(\text{Rs. } \frac{26,00,000}{40,000} \times 5,000 \text{ units} \right)$	<u>3,25,000</u>
Cost of Goods Sold	22,75,000
Add: Selling & Distribution Overheads	
Variable @ Rs. 3 × 35,000 units = 1,05,000	
Fixed (Rs. 1 × 60,000 units) = 60,000	<u>1,65,000</u>
Cost of Sales	24,40,000
Profit	<u>3,60,000</u>

Statement Showing Working Capital Requirement

A	Current Assets	Rs.
	Stock of Raw Materials (Rs. 8,00,000 × 3/12)	2,00,000
	Stock of Finished Goods	3,25,000
	Debtors at Cost (Rs. 24,40,000 × 3/24)	3,05,000
	Cash and Bank	<u>60,000</u>
	Total (A)	<u>8,90,000</u>
B	Current Liabilities	
	Creditors for Materials (Rs. 10,00,000 × 4/12)	3,33,333

Creditors for Expenses (Rs. 13,65,000 × 1/24)	56,875
Outstanding Wages (Rs. 6,00,000 × 1/12)	<u>50,000</u>
Total (B)	<u>4,40,208</u>
Working Capital Requirement before Contingencies (A – B)	4,49,792
Add: Provision for Contingencies (Rs. 4,49,792 × 1/9)	49,977
Estimated Working Capital Requirement	<u>4,99,769</u>

Workings Notes:

Purchase of Raw Material during the first year	Rs.
Raw Material consumed during the year	8,00,000
Add: Closing Stock of Raw Materials (3 months consumption)	<u>2,00,000</u>
	10,00,000
Less: Opening Stock of Raw Material	<u>Nil</u>
Purchases during the year	<u>10,00,000</u>

QUESTION 14 : PAPER – SEPT 2024

The following information is available for SK Limited for the year ended on 31st March,2024:

Particulars	Rs.
Cost of production	15,48,000
Cost of goods sold	14,61,000
Average stock of work-in-progress	94,600
Average stock of finished goods	2,43,500
Administration and Selling expenses	4,14,000
Receivables collection period	36 days
Raw Material Storage period	65 days
Creditors payment period	63 days

You are required to calculate the working capital requirement by operating cycle method. Assume a 360 days year.

SOLUTION :

Operating Cycle = R + W + F + D – C

Where,

R	= Raw material storage period	= 65 days
W	= Work-in-progress inventory* holding period	
F	= Finished goods storage period	
D	= Receivables (Debtors) collection period	= 36 days
C	= Credit period allowed by suppliers (Creditors)	= 63 days

Work-in-progress inventory holding period (W)

$$= \frac{\text{Average Work-in-progress inventory}}{\text{Average Cost of Production per day}}$$

$$= \frac{\text{Rs.94,600}}{\text{Rs.15,48,000} \div 360 \text{ days}} = \mathbf{22 \text{ days}}$$

Finished Goods storage period (F)

$$= \frac{\text{Average stock of finished goods}}{\text{Average Cost of Goods Sold per day}}$$

$$= \frac{\text{Rs.2,43,500}}{\text{Rs.14,61,000} \div 360 \text{ days}} = \mathbf{60 \text{ days}}$$

Net Operating Cycle = 65 + 22 + 60 + 36 – 63 = **120 days**

Number of Operating Cycles in a year

$$= \frac{\text{No. of days in a year}}{\text{Operating Cycle period}}$$

$$= \frac{360 \text{ days}}{120 \text{ days}} = \mathbf{3 \text{ times}}$$

Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of operating Cycles}} = \frac{\text{Rs.14,61,000} + \text{Rs.4,14,000}}{3} = \text{Rs.6,25,000}$$

QUESTION 15 : RTP – JAN 2025

Nirmoh Limited wants to avail short-term loan from the bank. However, bank grants short term loan by keeping the collateral in the form of accounts receivable. A bank is analyzing the receivables of Nirmoh Limited to identify acceptable collateral for a short-term loan.

The current policy of the company is 3/10 net 40. Bank will lend only to the extent of 90% of acceptable receivables at an interest rate of 12% only if both the conditions mentioned below are fulfilled. Bank will keep a reserve of 5% for cash discount & returns

- (a) Customers are not currently overdue for more than 5 days to the net period
- (b) Average aging (payment period) of the customer should not exceed 15 days past the net period.

If any of the above conditions are not fulfilled, the bank will lend 65% of the receivables subject to a reserve of 15% and the interest rate will be charged at 15% on such accounts. The corporate tax rate applicable is 25%.

On the scrutiny of all the receivables, following are the acceptable receivables considered for lending-

Accounts	Amount (Rs.)	Outstanding in Days since invoiced	Average Aging (payment period) in Days
DR 01	50,000	37	40
DR 02	25,000	25	48
DR 03	1,20,000	47	49
DR 04	72,000	10	56
DR 05	45,000	30	30
DR 06	1,75,000	39	50
DR 07	19,000	55	25
DR 08	54,000	44	54

DR 09	1,05,000	15	25
DR 10	37,000	22	75

You are required to CALCULATE:

- Total amount lend by the bank
- Effective Interest cost (%) to the company

SOLUTION :

(A) Condition (a) says that accounts shouldn't be overdue for more than 5 days to the net period. In other words, it means those accounts who are overdue by 45 days (40 days + 5 additional days), will not fulfill condition a) and thus will not be eligible for 90% lending. Therefore, from the above, we can see that **Accounts DR 03 & DR 07** are overdue for more than 45 days and hence will not be eligible for 90% lending.

Condition (b) says that average receivables ageing (payment period) should not exceed 15 days to the net period i.e. it should not exceed 55 days (40 days + 15 days = 55 days). Therefore, from the above, we can see that **Accounts DR 04 & DR 10** has an ageing of more than 55 days. Hence, they would also not be eligible for 90% lending.

Amount of Bank Lending:

Accounts	Bank Lending at 90%	Bank Lending at 65%
DR 01	50,000	-
DR 02	25,000	-
DR 03	-	1,20,000
DR 04	-	72,000
DR 05	45,000	-
DR 06	1,75,000	-
DR 07	-	19,000
DR 08	54,000	-
DR 09	1,05,000	-
DR 10	-	37,000
Total	4,54,000	2,48,000
(-) Reserve	22,700 {4,54,000 x 5%}	37,200 {2,48,000 x 15%}
Net	4,31,300	2,10,800
Loan	3,88,170	1,37,020

Total short-term loan granted by the bank = Rs. 5,25,190

(B) Calculation of the Effective Interest Cost

Interest at 12% (On 90% lending) = 3,88,170 x 0.12 = 46,580.4

Interest at 15% (On 65% lending) = 1,37,020 x 0.15 = 20,553

Total Interest = Rs. 67,133.4

Effective Interest Cost (%) = $\frac{\text{Interest (1-t)}}{\text{Total Short-term Loan}}$
= 67,133.4 (1-0.25) / 5,25,190

Effective Interest Cost (%) = 9.59%

QUESTION 16 : PAPER – JAN 2025

The following information pertain to MSD Limited for the year ending 31st March, 2024:

Particulars	Number of days
Raw material storage period	61 days
Work-in -progress conversion period	20 days
Finished goods storage period	30 days
Debt collection period	45 days
Creditors payment period	60 days

The annual operating cost (including depreciation of Rs. 4,80,000) was Rs. 60,00,000. Assume 360 days in a year.

You are required to calculate:

- Operating cycle period
- Number of operating cycles in a year
- Amount of working capital required for the company

SOLUTION :**(i) Net Operating Cycle Period**

$$= R + W + F + D - C$$

Where,

R = Raw material storage period.

W = Work-in-progress holding period.

F = Finished goods storage period.

D = Debtors collection period.

C = Credit period availed.

$$= 61 + 20 + 30 + 45 - 60$$

$$= 96 \text{ days}$$

(ii) Number of Operating Cycles in the Year

$$= \frac{360}{\text{Operating Cycle Period}} = \frac{360}{96} = 3.75 \text{ times}$$

(iii) Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{Rs.}60,00,000}{3.75} = \text{Rs.}16,00,000$$

Alternative Solution on cash cost basis to Part (ii)**(iii) Amount of Working Capital Required**

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{Rs.}60,00,000 - \text{Rs.}4,80,000}{3.75} = \text{Rs.}14,72,000$$

QUESTION 17 : RTP – MAY 2025

The management of Parshvam Limited is planning to expand its business at international level and consults you for preparing and estimation of working capital needs so that they can avail the finance from the bank. The estimated data of Parshvam Limited reveal the following information–

Particulars	Amount (Rs.)
Materials Used	
Domestic on 2 months credit	9,00,000
Imports on 3 months credit **	6,00,000
Lag in Payment of wages - 1 month	6,00,000
Lag in Payment of Manufacturing Overheads – ½ Month	26,40,000
Sales	
Domestic on 1.5 months credit	30,00,000
Export on 3 months credit (sale price 10% below domestic price)	24,80,000
Administrative expenses payable in advance for 2 months	3,60,000
Lag in payment of Selling & Distribution expenses – 1 month	3,00,000

Advance Income tax for Rs.25,000 for the quarter falling in the next financial year is paid by the company. Manufacturing overheads is inclusive of depreciation on the new machine purchased for tailor-made export products. The purchase price for the new machine is Rs.24,00,000 with a depreciation rate of 10%. Cash Gross profit is at 20% on domestic sales.

However, to promote exports, Export Promotion Council (EPC Board) provides a revenue subsidy of 2.5% for the new machine purchased. Furthermore, Parshvam Limited submits the letter of credit (LOC) to its bank and avails the all-Export Sales value within 1 month. Financial institution charges a fee of 5% for the same.

The company keeps one month stock of raw materials and finished goods each. Goods remain in process for half a month with 90% raw materials introduced in the process. The company believes in keeping cash and bank balance of Rs.1,50,000. The management is of the opinion that the safety margin is to be kept at 15%.

**Raw materials imported will attract a custom duty at 20% to be paid up front with a duty drawback of 5% credited upfront. You are required to -

- PREPARE the estimated working capital statement for the next year.
- ADVISE whether Parshvam Limited should continue with the export business or not. (Requisite assumptions and notes should form part of the solution).

SOLUTION :

(A) Statement for estimation of Working Capital using Cash Cost Basis

Parshvam Limited

Particulars	Amount (Rs.)	Amount (Rs.)
(A) Current Assets		
1. Raw materials $15,90,000 \times 1/12$	1,32,500	
2. WIP		
~ RM $15,90,000 \times 0.5 / 12 \times 90\%$	59,625	
~ Wages $6,00,000 \times 0.5 / 12 \times 50\%$	12,500	

	~ Manufacturing OH		
	23,40,000 x 0.5 /12 x 50%	48,750	
	~ Other OH 74,472 x 0.5 /12 x 50%	1,552	
3.	FG (on COGS) 46,04,472 x 1/12	3,83,706	
4.	Debtors		
	~ Domestic 27,61,314 x 1.5/12	3,45,164	
	~ Export 26,27,158 X 1/12 WN - 5	2,18,930	
5.	Cash/bank balance (given)	1,50,000	
6.	Prepaid admin exp 3,60,000 x 2/12	60,000	
7.	Income tax paid in advance (given)	25,000	
	Gross working capital		14,37,727
(B) Current Liabilities			
1.	Creditors		
	~ Domestic 9,00,000 x 2/12	1,50,000	
	~ Import 6,00,000 x 3/12	1,50,000	
2.	Lag in wages payment 6,00,000 x 1/12	50,000	
3.	Lag in manufacturing OH		
	23,40,000 x 0.5/12	97,500	
	Lag in other OH 74,472 x 0.5/12	3,103	
4.	Lag in S&D exp 3,00,000 x 1/12	25,000	
	Excess of CA over CL		9,62,124
	Add: 15% safety margin (9,87,124 x 15%)		1,44,319
	Net working capital		11,06,443

Notes –

- Working Capital is estimated on Cash Cost Basis
- Other Overheads are assumed to be the part of production.
- In absence of information on % completion for wages, manufacturing and other overheads, it is assumed to be 50% complete for the purpose of calculating WIP.
- Other Overheads are also assumed to be outstanding for a period of ½ month. In absence of specific information, it can also be assumed that nothing is outstanding or prepaid.

- (B)** If just the monetary aspects and factors are considered then, Parshvam limited should discontinue its operations at international level as the Cash Cost of sales for export at Rs. 26,27,158 is higher than the Export sales value which is just Rs. 24,80,000. In reality, non-monetary factors are also considered in decision making; exports will add a new customer base for the company. Furthermore, existence at international level brings on a high credibility and image to the company, etc.

WN 1 - Calculation of gross profit on Export Sales:

Let the domestic selling price be Rs.100.

Therefore, Gross profit = Rs.20, and cost per unit = Rs. 80

Now as given, Export price is 10% less than the domestic price = $100 - 10\% = \text{Rs. } 90$.
However, the cost per unit to produce exported goods will remain at Rs. 80 only.

So gross profit on exports will be $\text{Rs. } 90 - 80 = \text{Rs. } 10$.

Therefore, Gross profit in % for Export Sales = $10 / 90 = 11.11\%$

	Domestic	Export	Total
Sales	30,00,000	24,80,000	54,80,000
Less: Gross Profit 20% for Domestic 11.11% for Export	(6,00,000)	(2,75,528)	(8,75,528)
COGS	24,00,000	22,04,472	46,04,472
Add: Admin Exp (To be Apportioned in the ratio of Sales)	1,97,080	1,62,920	3,60,000
Add: S&D Expense (To be Apportioned in the ratio of Sales)	1,64,234	1,35,766	3,00,000
Add: Bank Fees and charges for providing LOC services	-	1,24,000	1,24,000
Cash Cost of Sales	27,61,314	26,27,158	53,88,472

WN 2 - Preparation of Cost/Income Statement

Particulars	Amount (Rs.)
Raw Materials	
Domestic	9,00,000
Import WN - 3	6,90,000
Wages	6,00,000
Manufacturing Overheads (Cash) WN - 4	23,40,000
Other Overheads (Bal. Fig)	74,472
Cost of Production/Cost of Goods Sold	46,04,472
Add: Admin Exp	3,60,000
Add: S&D Exp	3,00,000
Add: Bank charges & Fees for L.O.C services	1,24,000
Cost of Sales	53,88,472

WN 3 – Calculation of Raw Materials Purchased - Imports

Purchase Price	= Rs. 6,00,000
+ Custom Duty @ 20%	= Rs. 1,20,000
(-) Upfront Duty Drawback @ 5%	= Rs. (30,000)
Total Value of Raw materials	= Rs. 6,90,000

WN 4 – Calculation of Cash Manufacturing Overheads

Manufacturing Overheads	= Rs. 26,40,000
Less: Depreciation on Machinery	

(24,00,000 x 10%) = Rs. (2,40,000)

Less: Revenue Subsidy from EPC Board ***

(24,00,000 x 2.5%) = Rs. (60,000)

Cash Manufacturing Overheads = Rs. 23,40,000

***Revenue subsidy shall not be capitalized but instead it will result in bringing down your manufacturing expenses which is revenue in nature. Had the it been the capital subsidy, then it would have reduced the purchase price of the machine and thereby changing the amount of depreciation.

WN 5 - Credit Period for Export customers

Since the company is availing benefit of Letter of Credit (L.O.C), the funds blocked in export customers would only be for 1 month and not 3 months; as the company would receive the entire Export Sales value in 1 month's time from the financial institution after paying the bank charges and fees.

QUESTION 18 : RTP – SEPT 2025

A firm has a total sale of Rs. 200 lakhs of which 80% is on credit. It is offering credit terms of 2/40, net 120. Of the total, 50% of customers avail of discount and the balance pay in 120 days. Past experience indicates that bad debt losses are around 1.5% of credit sales. The firm spends about Rs. 2,40,000 per annum to administer its credit sales. These are avoidable as a factor is prepared to buy the firm's receivables. He will charge 2% commission. He will pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve.

- (i) DETERMINE the effective cost of factoring? Consider year as 360 days.
- (ii) If bank finance for working capital is available at 12% interest, ADVISE, should the firm avail of factoring service

SOLUTION :

Particulars	(Rs.)
Total Sales	Rs. 200 lakhs
Credit Sales (80%)	Rs. 160 lakhs
Receivables for 40 days	Rs. 80 lakhs
Receivables for 120 days	Rs. 80 lakhs
Average collection period [(40 x 0.5) + (120 x 0.5)]	80 days
Average level of Receivables (Rs. 1,60,00,000 x 80/360)	Rs. 35,55,556
Factoring Commission (Rs. 35,55,556 x 2/100)	Rs. 71,111
Factoring Reserve (Rs. 35,55,556 x 10/100)	Rs. 3,55,556
Amount available for advance {Rs. 35,55,556 - (3,55,556 + 71,111)}	Rs. 31,28,889
• Factor will deduct his interest @ 18%:	
• Interest = $\frac{\text{Rs.}31,28,889 \times 18 \times 80}{100 \times 360}$	Rs. 1,25,156
• Advance to be paid (Rs. 31,28,889 – Rs. 1,25,156)	Rs. 30,03,733

(i) Statement Showing Evaluation of Factoring Proposal

		Rs.
A	Annual Cost of Factoring to the Firm:	
	Factoring commission (Rs. 71,111 × 360/80)	3,20,000
	Interest charges (Rs. 1,25,156 × 360/80)	<u>5,63,200</u>
	Total	<u>8,83,200</u>
B	Firm's Savings on taking Factoring Service:	
	Cost of credit administration saved	2,40,000
	Bad Debts (Rs. 160,00,000 × 1.5/100) avoided	<u>2,40,000</u>
	Total	<u>4,80,000</u>
C	Net Cost to the firm (A – B) (Rs. 8,83,200 – Rs. 4,80,000)	<u>4,03,200</u>

$$\text{Effective cost of factoring} = \frac{\text{Rs. } 4,03,200}{100 \times 360}$$

* If cost of factoring is calculated on the basis of total amount available for advance, then, it will be = $\frac{\text{Rs. } 4,03,200}{\text{Rs. } 31,28,889} \times 100 = 12.89\%$

- (ii)** If Bank finance for working capital is available at 12%, firm will not avail factoring service as 12% is less than 13.42% (or 12.89%)

QUESTION 19 : RTP – MAY 2026

Following information is forecasted by the Puja Limited for the year ending 31st March, 2025:

	Balance as at 1st April, 20X6	Balance as at 31st March, 20X7
	(Rs.)	(Rs.)
Raw Material	45,000	65,356
Work-in-progress	35,000	51,300
Finished goods	60,181	70,175
Debtors	1,12,123	1,35,000
Creditors	50,079	70,469
Annual purchases of raw material (all credit)		4,00,000
Annual cost of production		7,50,000
Annual cost of goods sold		9,15,000
Annual operating cost		9,50,000
Annual sales (all credit)		11,00,000

You may take one year as equal to 365 days.

You are required to CALCULATE:

- Net operating cycle period.
- Number of operating cycles in the year.
- Amount of working capital requirement using operating cycles.

SOLUTION :**Working Notes:****1. Raw Material Storage Period (R)**

$$\begin{aligned}
 &= \frac{\text{Average Stock of Raw Material}}{\text{Annual Consumption of Raw Material}} \times 365 \\
 &= \frac{\text{Rs.45,000} + \text{Rs.65,356}}{2} \times 365 \\
 &= \frac{\text{Rs.3,79,644}}{2} \times 365 \\
 &= 53 \text{ days.}
 \end{aligned}$$

Annual Consumption of Raw Material

$$\begin{aligned}
 &= \text{Opening Stock} + \text{Purchases} - \text{Closing Stock} \\
 &= \text{Rs. 45,000} + \text{Rs. 4,00,000} - \text{Rs. 65,356} \\
 &= \text{Rs. 3,79,644}
 \end{aligned}$$

2. Work-in-Progress (WIP) Conversion Period (W)

$$\begin{aligned}
 \text{WIP Conversion Period} &= \frac{\text{Average Stock of WIP}}{\text{Annual Cost of Production}} \times 365 \\
 &= \frac{\text{Rs.35,000} + \text{Rs.51,300}}{2} \times 365 \\
 &= \frac{\text{Rs.7,50,000}}{2} \times 365 \\
 &= 21 \text{ days}
 \end{aligned}$$

3. Finished Stock Storage Period (F)

$$\begin{aligned}
 &= \frac{\text{Average Stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 365 \\
 &= \frac{\text{Rs.65,178}}{\text{Rs.9,15,000}} \times 365 = 26 \text{ days.} \\
 \text{Average stock} &= \frac{\text{Rs.65,178} + \text{Rs.70,175}}{2} \\
 &= \text{Rs.65,178.}
 \end{aligned}$$

4. Debtors Collection Period (D)

$$\begin{aligned}
 &= \frac{\text{Average Debtors}}{\text{Annual Credit Sales}} \times 365 \\
 &= \frac{\text{Rs.1,23,561.50}}{\text{Rs.11,00,000}} \times 365 \\
 &= 41 \text{ days} \\
 \text{Average debtors} &= \frac{\text{Rs.1,12,123} + \text{Rs.1,35,000}}{2} = \text{Rs.1,23,561.50}
 \end{aligned}$$

5. Creditors Payment Period (C)

$$\begin{aligned}
 &= \frac{\text{Average Creditors}}{\text{Annual Net Credit Purchases}} \times 365 \\
 &= \frac{\left(\frac{\text{Rs.50,079} + \text{Rs.70,469}}{2} \right)}{\text{Rs.4,00,000}} \times 365
 \end{aligned}$$

$$= 55 \text{ days}$$

(i) Operating Cycle Period

$$= R + W + F + D - C$$

$$= 53 + 21 + 26 + 41 - 55$$

$$= 86 \text{ days}$$

(ii) Number of Operating Cycles in the Year

$$= \frac{365}{\text{Operating Cycle Period}} = \frac{365}{86} = 4.244$$

(iii) Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{Rs.9,50,000}}{4.244} = \text{Rs.2,23,845.42}$$

QUESTION 20 : RTP – SEPT 2026

A firm has total annual sales of Rs. 200 lakhs, of which 80% are made on credit. The company offers credit terms of 2/40, net 120. Out of the total credit customers, 50% avail themselves of the cash discount, while the remaining customers settle their accounts after 120 days.

Based on past experience, bad debt losses amount to approximately 1% of credit sales. In addition, the firm incurs Rs. 2,40,000 per annum in administering its credit sales. These costs can be avoided because a factor is willing to purchase the firm's receivables.

The factor will charge a 2% commission and provide advances against receivables at an interest rate of 18%, while retaining 10% of the receivables as a reserve.

Required:

- Determine the effective cost of factoring. Assume a 360-day year.
- If bank finance for working capital is available at an interest rate of 14%, advise whether the firm should avail itself of the factoring service.

SOLUTION :

Particulars	(Rs.)
Total Sales	Rs. 200 lakhs
Credit Sales (80%)	Rs. 160 lakhs
Receivables for 40 days	Rs. 80 lakhs
Receivables for 120 days	Rs. 80 lakhs
Average collection period $[(40 \times 0.5) + (120 \times 0.5)]$	80 days
Average level of Receivables $(\text{Rs. } 1,60,00,000 \times 80/360)$	Rs. 35,55,556
Factoring Commission $(\text{Rs. } 35,55,556 \times 2/100)$	Rs. 71,111
Factoring Reserve $(\text{Rs. } 35,55,556 \times 10/100)$	Rs. 3,55,556
Amount available for advance $\{\text{Rs. } 35,55,556 - (3,55,556 + 71,111)\}$	Rs. 31,28,889
• Factor will deduct his interest @ 18% :	
• Interest = $\frac{\text{Rs.31,28,889} \times 18 \times 80}{100 \times 360}$	Rs. 1,25,156
• Advance to be paid $(\text{Rs. } 31,28,889 - \text{Rs. } 1,25,156)$	Rs. 30,03,733

(i) **Statement Showing Evaluation of Factoring Proposal**

		Rs.
A.	Annual Cost of Factoring to the Firm:	
	Factoring commission (Rs. 71,111 × 360/80)	3,20,000
	Interest charges (Rs. 1,25,156 × 360/80)	<u>5,63,200</u>
	Total	<u>8,83,200</u>
B.	Firm's Savings on taking Factoring Service:	Rs.
	Cost of credit administration saved	2,40,000
	Bad Debts (Rs. 160,00,000 × 1/100) avoided	<u>1,60,000</u>
	Total	<u>4,00,000</u>
C.	Net Cost to the firm (A – B) (Rs. 8,83,200 – Rs. 4,00,000)	<u>4,83,200</u>

$$\text{Effective cost of factoring} = \frac{\text{Rs. } 4,83,200}{\text{Rs. } 30,03,733} \times 100 = 16.09\%$$

* If cost of factoring is calculated on the basis of total amount available for advance, then, it will be

$$= \frac{\text{Rs. } 4,83,200}{\text{Rs. } 31,28,889} \times 100 = 15.44\%$$

- (ii) If Bank finance for working capital is available at 14%, firm will not avail factoring service as 14 % is less than 16.08% (or 15.44%)

Thanks

CHAPTER

11

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 :

$$\text{The optimum cash balance } C = \sqrt{\frac{2 \times \text{Rs.1,26,00,000} \times \text{Rs.20}}{0.08}} = \text{Rs.79,372.54}$$

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.

- 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
- Calculate the forecast current ratio at the end of the three months period.

SOLUTION :**Working Notes:**

- 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

- Company's average cash balance
- Number of conversions each year and
- Time interval between two conversions.

SOLUTION :

Answer:

- 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

$$\text{Opportunity cost of one-rupee p.a. (S)} = \frac{12}{100} = 0.12$$

$$\text{Optimum cash balance (C)} = \sqrt{\frac{2UP}{S}} = \sqrt{\frac{2 \times 36,00,000 \times 60}{0.12}} = \text{Rs. } 60,000$$

$$\therefore \text{Average Cash balance} = \frac{(0 + 60,000)}{2} = \text{Rs. } 30,000$$

(ii) Number of conversions p.a.

Annual cash outflow = Rs. 36,00,000

Optimum cash balance = Rs. 60,000

$$\therefore \text{No. of conversions p.a.} = \frac{36,00,000}{60,000} = 60$$

(iii) Time interval between two conversions

No. of days in a year = 360

No. of conversions p.a. = 60

$$\therefore \text{Time interval} = \frac{360}{60} = 6 \text{ days}$$

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 balance	-	10,50,000	-	1,37,500	5,25,000	7,25,000
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 (Minimum stock)	5,00,000	-	-	-	-	-
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 (10% on Rs. 40 lakhs for six months)	2,00,000		
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: Depreciation on 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 (Rs.)	Mar (Rs.)	Apr (Rs.)	May (Rs.)	Jun (Rs.)	Jul (Rs.)	Aug (Rs.)	Sep (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. Rs.	May Rs.	June Rs.	July Rs.	Aug. Rs.	Sept. 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

QUESTION 7 : PAPER - JAN 2025

KP Ltd. has provided the following information:

(i) Estimated monthly sales:

Month	Rs. in Lakh
Apr-24	10
May-24	12
Jun-24	15
Jul-24	10
Aug-24	13
Sep-24	14

(ii) Gross Profit Ratio is 20%.

(iii) Cost of Goods sold is paid in next month.

(iv) Sales are in credit and credit period is allowed for 2 months.

(v) Indirect Expenses are paid in the same month.

Monthly indirect expenses are as follows:

Month	Rs. in Lakh
Jun-24	1.0
Jul-24	1.2
Aug-24	1.0
Sep-24	1.3

(vi) Dividend amounting September 2024, 3 Lakh will be paid in the month of September 2024

(vii) Cash Balance on 01/07/2024 was 1.5 Lakh.

(viii) The company has to maintain minimum cash balance of 1 Lakh. If there is cash balance deficit in any month, company would take a temporary short term loan and if cash balance exceed 2 Lakh, then company would invest for short term excess amount of 2 Lakh.

(ix) Ignore the interest on short term loans and short term investment.

You are required to prepare Cash Budget for three months starting from July 2024.

SOLUTION :

Cash Budget		(Rs. in lakh)	
Particulars	July	August	September
Opening Balance	1.5	1	2
Add: Receipts			
Collection from debtors	12	15	10
Total cash available (A)	13.5	16	12
Less: Payments			
Payment of COGS	12	8	10.4
Payment of indirect exp	1.2	1	1.3
Payment of Dividend	-	-	3
Total payments (B)	13.2	9	14.7
Closing Balance before adjustment	0.3	7	-2.7
Minimum cash balance desired	1	1	1
Less: Temporary Investment	-	5	-
Add: Temporary Borrowing	0.7	-	3.7
Cash Closing Balance	1	2	1

W.N. 1				
COGS payment	June	July	Aug	Sept
Sales	15	10	13	14
COGS (80%)	12	8	10.4	11.2
Paid in		12	8	10.4

QUESTION 8 : PAPER - MAY 2026

AR Ltd. has given following data for the year ended 31st March, 2026:

- Receivables are collected on an average after 60 days,
- Inventories are held for average period of 90 days before being sold.
- The company usually settles its payables with suppliers after 30 days.
- The total sales of the company amounts to Rs. 200 lakhs, which is earned evenly throughout the year. All sales are credit sales. Net profit margin is 10%. The company has not incurred any non-operating expenses during the year.
- Tax rate is 30%.
- Assume 360 days in a year.
- Opportunity cost of investment is 12%.

On the basis of the above data:

- (i) Calculate the cash cycle and the minimum cash balance to be maintained to meet its obligations.

- (ii) The company is planning to propose a scheme, whereby it will offer a cash discount of 2% to debtors to reduce the debtors' collection period by 30 days. It is expected that 60% of the debtors will avail the scheme.
- (A) What will be reduction in the minimum cash to be maintained to meet obligation after the proposed scheme is adopted?
- (B) What will be net saving due to such scheme?
- (C) Should the company adopt the scheme?

SOLUTION :

- (i) Cash cycle = 60 days + 90 days – 30 days = 120 days (4 months)
 Cash turnover = 12 months (360 days)/4 months (120 days) = 3.
 Total Cash Outlay = Sales – Net Profit
 = 200 Lakhs – 20 Lakhs = Rs. 180 Lakhs
 Minimum operating cash = Total operating annual outlay/cash turnover
 = Rs. 180 lakhs/3 = Rs. 60 lakhs.

(ii) **(A) Reduction in Minimum Cash Balance**

First, we calculate the new average collection period and the new cash cycle.

New Average Collection Period: 30 days

New Cash Cycle: 30 + 90 – 30 = 90 days

New Cash Turnover: 360/90 = 4 times

New Minimum Cash Balance: 180/4 = Rs. 45 Lakhs

Reduction in Cash Balance: 60 Lakhs – 45 Lakhs = Rs. 15 Lakhs

(B) Net Saving Due to Scheme

Opportunity Cost Saving = 12% of reduction in cash balance (15 Lakhs) × (1 – 0.30) = Rs. 1.26 Lakhs

Cost of Cash Discount = 2% of 60 % of Total Sales × (1 – 0.30)
 = 0.02 × 0.60 × 200 Lakhs = Rs. 1.68 Lakhs

Net Saving = 1.26 Lakhs – 1.68 Lakhs = Rs. (0.42 Lakhs)

(C) Recommendation

No, the company should not adopt the scheme.

Solution for part (ii) can be done in following alternative way:

If we assume

- 60% of debtors will pay 30 days early (Collection period = 30 days).
- The remaining 40% of debtors will *not* avail the scheme and will continue to pay after the normal 60 days.

Therefore, the New Average Collection Period:

= (60% × 30 days) + (40% × 60 days) = 18 days + 24 days = 42 days

Cash Cycle & Cash Balance:

- New Cash Cycle = 90 (Inventory) + 42 (New Debtors) – 30 (Payables) = 102 days
- New Cash Turnover = 360 / 102 = 3.529 times

- New Minimum Cash Balance = Rs. 180 Lakhs / 3.529 = Rs. 51 Lakhs
 - Reduction in Cash Balance = Rs. 60 Lakhs - Rs. 51 Lakhs = Rs. 9 Lakhs
- (B) Net Savings:
- Opportunity Cost Saving: Rs. 9 Lakhs $\times$ 12% $\times$ (1 - 0.30) = Rs. 0.756 Lakhs
 - Cost of Cash Discount: 2% $\times$ 60% $\times$ 200 Lakhs $\times$ (1 - 0.30) = Rs. 1.68 Lakhs
 - Net Saving: Rs. 0.756 Lakhs - Rs. 1.68 Lakhs = (Rs. 0.924 Lakhs) or (Net Loss of Rs. 92,400)
- (C) No, the company should not adopt the scheme, because it results in a net financial loss of Rs. 0.924 Lakhs.

QUESTION 9 : RTP - SEPT 2026

You have been asked to prepare a cash budget for the next quarter, January through March, for Jahanara Fashions. They have provided you with the following information:

- Sales are expected to be: Rs. 400,000 in January, Rs. 400,000 in February, and Rs. 600,000 in March. All sales will be in cash.
- The estimated purchases are: Rs.380,000 in January, Rs. 360,000 in February, and Rs. 450,000 in March. Payments for purchases will be made after a lag of one month. Outstanding on account of purchases in December last are Rs. 350,000.
- The rent per month is Rs. 10,000 and the partners' personal withdrawal per month is Rs.25,000.
- Salaries and other expenses, payable in cash, are expected to be: Rs. 25,000 in January, Rs. 20,000 in February, and Rs. 30,000 in March.
- They plan to buy furniture worth Rs. 40,000 on cash payment in January.
- The cash balance at present is Rs. 6,000. Their target cash balance, however, is Rs. 15,000. What will be surplus/ deficit of cash in relation to their target cash balance?

SOLUTION :

The projected cash inflows and outflows for the quarter, January through March, is shown below:

Month	December (Rs.)	January (Rs.)	February (Rs.)	March (Rs.)
Inflows:				
Sales collection		4,00,000	4,00,000	6,00,000
Outflows:				
Payment to sundry creditors		3,50,000	3,80,000	3,60,000
Rent		10,000	10,000	10,000
Drawings		25,000	25,000	25,000
Salaries & other expenses		25,000	20,000	30,000
Purchase of furniture		40,000		
Total outflows 2 to 6)		4,50,000	4,35,000	4,25,000

Given an opening cash balance of Rs.6,000 and a target cash balance of Rs. 15,000, the surplus/deficit in relation to the target cash balance is worked out below:

		January (Rs.)	February (Rs.)	March (Rs.)
1	Opening balance	6,000		
2	Inflows	4,00,000	4,00,000	6,00,000
3	Outflows	4,50,000	4,35,000	4,25,000
4	Net cash flow (2 - 3)	(50,000)	(35,000)	1,75,000
5	Cumulative net cash flow	(50,000)	(85,000)	90,000
6	Opening balance + Cumulative net cash flow	(44,000)	(79,000)	96,000
7	Minimum cash balance required	15,000	15,000	15,000
8	Surplus/(Deficit)	(59,000)	(94,000)	81,000

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.

- Calculate the Recorder Inventory Level.
- Calculate the Economic Order Quantity (EOQ).
- 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 $\frac{1}{2}$ 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 $\frac{1}{2}$ 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

$$= \text{Variable Cost} \times \frac{\text{Collection period}}{360} \times \text{Rate of Return}$$

$$\text{Present Policy} = \text{Rs. } 24,00,000 \times \frac{45}{360} \times 15\% = \text{Rs. } 54,000$$

$$\text{Proposed Policy} = \text{Rs. } 28,80,000 \times \frac{15}{360} \times 15\% = \text{Rs. } 18,000$$

QUESTION 2 : JULY 2021

Current annual sale of SKD Ltd is Rs. 360 Lakhs. Its directors are of the opinion 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 $\frac{\text{Collection period}}{12} \times \frac{\text{Rate of Return}}{100}$
Present Policy	= Rs. 288 Lakhs x $\frac{2}{12} \times \frac{20}{100}$ = Rs. 9.6 Lakhs
Policy X	= Rs. 288 Lakhs x $\frac{1.5}{12} \times \frac{20}{100}$ = Rs. 7.2 Lakhs
Policy Y	= Rs. 288 Lakhs x $\frac{1}{12} \times \frac{20}{100}$ = 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.

- 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.
- Factor will charge commission @ 2%
- The company spends Rs. 1,00,000 p.a. on administration of debtor. These are avoidable cost.
- 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 x 0.15 x (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 x 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 in 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

$$\text{Present Policy} = \frac{12,00,000 \times 50 \times 0.01}{100} \text{ Rs. 6,000}$$

$$\text{Proposed Policy} = 15,00,000 \times 0.80 \times 0.02 = \text{Rs. 24,000}$$

(ii) Opportunity Cost of Investment in Receivables

$$\text{Present Policy: Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$$

$$= 9,60,000 \times \frac{40}{360} \times \frac{15}{100} = \text{Rs. 16,000}$$

$$\text{Proposed Policy Total Cost} \times \frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$$

$$= 12,00,000 \times \frac{30}{360} \times \frac{15}{100} = \text{Rs. 15,000}$$

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 = $\frac{12,00,000 \times 50 \times 0.1}{100} = \text{Rs. } 6,000$

Proposed Policy = $16,00,000 \times 0.80 \times 0.02 = \text{Rs. } 25,600$

(ii) Opportunity Cost of Investment in Receivables

Present Policy = $9,36,000 \times (30/360) \times (70\% \text{ of } 15)/100 = 78,000 \times 10.5/100 = \text{Rs. } 8,190$

Proposed Policy = $12,48,000 \times (20/360) \times 10.5/100 = \text{Rs. } 7,280$

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 policies. 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 company's 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

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection Period}}{12} \times \frac{\text{Rate of Return}}{100}$$

Present Policy = Rs.135 lakhs $\times$ 2.4/12 $\times$ 20% = Rs. 5.40 lakhs

Proposed Policy I = Rs. 165 lakhs $\times$ 3/12 $\times$ 20% = Rs. 8.25 lakhs

Proposed Policy II = Rs. 210 lakhs $\times$ 4/12 $\times$ 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.'s 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.'s 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

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$$

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 2/5 th 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)

SOLUTION :

Evaluation of Factoring Proposal

	Particulars	Rs.	Rs.
A.	Savings due to factoring		
	Bad Debts saved	$0.75\% \times 7.5 \text{ crores} \times 90\%$	Rs. 5,06,250
	Administration cost saved	$18.6 \text{ lakhs} \times 2/5$	Rs. 7,44,000
	Interest saved due to reduction in average collection period	$7.5 \text{ crores} \times 90\% \times (70-45)/360 \times 12.5\%$	Rs. 5,85,937.5
	Total		Rs. 18,36,187.5
B	Costs of factoring:		
	Service charge	$7.5 \text{ crores} \times 90\% \times 2\%$	Rs. 13,50,000
	Interest cost	$\text{Rs. } 1,15,171.875 \times 360/45$	Rs. 9,21,375
	Redundancy Payment		Rs. 50,000
	Total		Rs. 23,21,375
C	Net Annual cost to the Firm: (A-B)		Rs. 4,85,187.5
	Rate of effective cost of factoring	$\text{Rs. } 4,85,187.5 / \text{Rs. } 64,66,078.125 \times 100$	7.50%

Advice: Since the rate of effective cost of factoring is less than the existing cost of capital, therefore, the proposal is acceptable.

Credit Sales = Rs. 7.5 crores x 90% = Rs. 6,75,00,000

Average level of receivables = Rs. 6.75 crores x 45/360 = Rs. 84,37,500

Service charge = 2% of Rs. 84,37,500 Rs. 1,68,750

Reserve = 20% of Rs. 84,37,500 Rs. 16,87,500

Total (i) Rs. 18,56,250

Thus, the amount available for advance is

Average level of receivables Rs. 84,37,500

Less: Total (i) from above Rs. 18,56,250

(ii) Rs. 65,81,250

Less: Interest @ 14% p.a. for 45 days Rs. 1,15,171.875

Net Amount of Advance available. Rs. 64,66,078.125

Note: Alternatively, if redundancy cost is taken as irrelevant for decision making, then Net Annual cost to the Firm will be Rs. 4,35,187.5 and Rate of effective cost of factoring will be Rs. 4,35,187.5/Rs. 64,66,078.125 x 100 = 6.730%

If average level of receivables is considered for 70 days then the calculation can be done in following way:

Evaluation of Factoring Proposal

Credit Sales = Rs. 7.5 crores X 90%	= Rs. 6,75,00,000
Average level of receivables = Rs. 6.75 crores x 70/360	= Rs. 1,31,25,000
Service charge = 2% of Rs. 1,31,25,000	Rs. 2,62,500
Reserve = 20% of Rs. 1,31,25,000	<u>Rs. 26,25,000</u>
Total (i)	Rs. 28,87,500
Thus, the amount available for advance is	
Average level of receivables	Rs. 1,31,25,000
Less: Total (i) from above	<u>Rs. 28,87,500</u>
(ii)	Rs. 1,02,37,500
Less: Interest @ 14% p.a. for 45 days	<u>Rs. 1,79,156.25</u>
Net Amount of Advance available.	<u>Rs. 1,00,58,343.75</u>

Note 1: Accordingly, interest cost will be Rs. 14,33,250 cost of factoring will be Rs. 28,33,250. Therefore, Rate of effective cost of factoring is 9.913%

Note 2: Alternatively, if redundancy cost is taken as irrelevant for decision making, then Net Annual cost to the Firm will be Rs. 9,47,062.5 and Rate of effective cost of factoring will be Rs. 9,47,062.5/ Rs. 1,00,58,343.75 x 100 = 9.416%.

Advice: Since the rate of effective cost of factoring is less than the existing cost of capital, therefore, the proposal is acceptable.

QUESTION 12 : RTP – SEPT 2024

Banu Limited is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. 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. Policy option II requires a manager to manage the receivables with salary of Rs. 50,000 per month. The company's variable costs are 60% of the selling price. Given the following information, 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 other than manager salary	135.00	165.00	210.00
	(c) Salary of Manager	-	-	6
	(d) Bad Debts	7.50	22.50	47.50
	(e) Expected Profit [(a)-(b)-(c)-(d)]	82.50	87.50	86.50
B	Opportunity Cost of Investment in Receivables*	5.40	8.25	14.40
C	Net Benefits [A-B]	77.10	79.25	72.10

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**

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection Period}}{12} \times \frac{\text{Rate of Return}}{100}$$

Present Policy = Rs. 135 lakhs $\times$ 2.4/12 $\times$ 20% = Rs. 5.40 lakhs

Proposed Policy I = Rs. 165 lakhs $\times$ 3/12 $\times$ 20% = Rs. 8.25 lakhs

Proposed Policy II = Rs. 216 lakhs $\times$ 4/12 $\times$ 20% = Rs. 14.40 lakhs

QUESTION 13 : PAPER – SEPT 2024

AB Enterprises deals in hardware materials having current turnover Rs. 30 Lakhs per annum. All sales are on credit and average collection period is 30 days with zero bad debts. The customers are requesting to increase the credit period. As a result of increase in credit period sales will also increase. Other information is as under:

Credit policy	Increase in collection period (days)	Increase in sales (Rs.)	Bad debts anticipated
A	15	3,00,000	1%
B	30	5,00,000	3.5%

The Selling price is Rs. 100/- per unit. Variable cost per unit is Rs. 50/- and fixed cost is Rs. 5,00,000. Required rate of return on additional investment is 20%. Creditors for variable cost are ready to give 15 days extra credit for the additional cost incurred. Assume a 360 days year.

You are required to analyse the present and proposed credit policies using the “Total Approach” method and recommend the credit policy to be adopted.

SOLUTION :

Statement showing the Evaluation of Credit Policies (Total Approach)

Particulars		Present Credit Policy	Proposed Credit Policy	
			A	B
	Credit Period (in days)	30	45	60
	Units sold	30,000	33,000	35,000
	Rs.		Rs.	Rs.
A	Expected Profit:			
	(a) Credit Sales @ Rs. 100 per unit	30,00,000	33,00,000	35,00,000
	(b) Total Cost other than Bad Debts			
	(i) Variable Costs @ Rs. 50 per unit	15,00,000	16,50,000	17,50,000
	(ii) Fixed Costs	5,00,000	5,00,000	5,00,000
		20,00,000	21,50,000	22,50,000
	(c) Bad Debts		33,000	1,22,500
	(d) Expected Profit [(a) – (b) – (c)]	10,00,000	11,17,000	11,27,500
B	Opportunity Cost of Investments in Receivables (i)-(ii)	33,333	52,500	72,917
C	Net Benefits (A – B)	9,66,667	10,64,500	10,54,583

Recommendation: The Proposed Policy A (i.e. increase in collection period by 15 days or total 45 days) should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Notes:

Calculation of Opportunity Cost of Average Investment in Receivables

Particulars		Present Credit Policy	Proposed Credit Policy	
			A	B
	Credit Period (in days)	30	45	60
	Rs.		Rs.	Rs.
(a)	Cost of Sales (Variable Cost + Fixed Cost)	20,00,000	21,50,000	22,50,000
(b)	Average Debtors = Cost of Sales × (Credit period) / 360	1,66,667	2,68,750	3,75,000
(c)	Average Creditors for extra variable cost [(Variable Cost) × 15/360]	-	6,250	10,417
(d)	Average Investment in Receivables or Net Working Capital = (b) – (c)	1,66,667	2,62,500	3,64,583
(e)	Opportunity Cost @20% of average Investments in Receivables	33,333	52,500	72,917

QUESTION 14 : PAPER – JAN 2026

X Ltd. has average debtors of Rs. 90,00,000. The company's average collection period is 60 days. At present, it incurs credit administration expenses of Rs. 4,00,000 per year and bad-debt losses amounting to 1% of credit sales.

A factoring company has proposed to purchase these receivables by charging a commission of 2% on credit sales. The factor will provide an advance of 85% of receivables, after keeping 15% as reserve, and will charge interest at 15% per annum for the collection period. Assume 360 days in a year.

Required:

- (i) Calculate the effective cost of factoring.
- (ii) As a financial consultant, advise whether X Ltd. should accept the factoring proposal.

SOLUTION :

(i) **Working notes:**

$$\text{Credit Sales} = \frac{90,00,000 \times 360}{60} = \text{Rs. } 5,40,00,000$$

	Particulars	Rs.
A.	Annual Savings (Benefit) on taking Factoring Service	
	Cost of credit administration saved	Rs. 4,00,000
	Bad debts avoided	Rs. 5,40,000
	Total	Rs. 9,40,000
B.	Annual Cost of Factoring to the Firm:	
	Factoring Commission [2% x 5,40,00,000]	Rs. 10,80,000
	Interest Charged by Factor on advance (90,00,000 – 1,80,000 – 13,50,000) x 15%	Rs. 11,20,500
	Total	Rs. 22,00,500
C.	Net Cost of Factoring to the Firm:	Rs. 12,60,500

Advance to be paid

$$= (90,00,000 - 1,80,000 - 13,50,000) - \left(\frac{\text{Rs. } 74,70,000 \times 0.15 \times 60}{360 \times 100} \right)$$

$$= \text{Rs. } 72,83,250$$

$$\begin{aligned} \text{Rate of Effective Cost of Factoring to the Firm} &= \frac{12,60,500}{72,83,250} \times 100 \\ &= 17.307\% \end{aligned}$$

Rate of Effective Cost of Factoring to the Firm can also be also calculated for advance without taking Interest into consideration:

Rate of Effective Cost of Factoring to the Firm =

$$\frac{12,60,500}{74,70,000(90,00,000 - 1,80,000 - 13,50,000)} \times 100 = 16.874\%$$

- (ii) **Advice:** Since the cost to the firm exceeds the saving to the firm on account of factoring, therefore, the proposal should not be acceptable.

QUESTION 15 : PAPER – MAY 2026

B Ltd. has received an offer to get a discount of 2% on an invoice value of Rs.75,000, if payment is made within one month instead of normal credit terms of 3 months. If the company makes early payment, it will need to finance the payment through a bank overdraft of 10% p.a. Tax rate is 30%.

Whether B Ltd. should accept the offer? Support your decision with calculations.

SOLUTION :

Discount on early payment = $2\% \times 75,000 = \text{Rs.}1,500$

Net Benefit (A) = $\text{Rs. } 1,500 - \text{Tax (30\%)} = \text{Rs. } 1,050$

The company must borrow the discounted invoice amount via a bank overdraft for the 2-month period.

Amount to be Borrowed = $75,000 - 1,500 = \text{Rs. } 73,500$

Bank overdraft interest for 2 months:

$$\begin{aligned} &= P \times R \times T \\ &= 73,500 \times 10\% \times 2/12 \\ &= \text{Rs. } 1,225 \end{aligned}$$

$$\begin{aligned} \text{After tax interest cost} &= 1,225 \times (1-0.30) \\ &= 1,225 \times 0.70 \\ &= \text{Rs. } 857.50 \end{aligned}$$

$$\begin{aligned} \text{Net Saving} &= \text{Net Benefit} - \text{Net Interest Cost} \\ &= \text{Rs. } 1,050 - \text{Rs. } 857.50 \\ &= \text{Rs. } 192.50 \text{ (Net Saving)} \end{aligned}$$

Since the company gains a net benefit of Rs. 192.50 by making early payment, B Ltd. should accept the discount offer.

Alternatively, the question can be solved as below:

Annualized benefit of discount

$$\begin{aligned} &= \frac{\text{Discount \%}}{100 - \text{Discount\%}} \times \frac{12 \text{ months}}{\text{Credit period} - \text{Discount period}} \\ &= 2/98 \times 12/2 \times 100 = 12.245 \% \\ \text{Post tax benefit} &= 12.245 \times (1-0.3) = 8.571 \\ \text{Post tax Bank OD rate} &= 10\% \times (1-0.3) = 7\% \end{aligned}$$

Benefit of discount is more than cost of OD. Hence, discount should be accepted.

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

$$\frac{\text{Rs.}1.5}{\text{Rs.}100 - \text{Rs.}1.50} \times \frac{365 \text{ days}}{40 - 10 \text{ days}} = 18.53\%$$

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 '9,85,000 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 $2/98 \times 360/60 \times 100 = 12.24\%$.
- (iii) **Factoring:**
Commission charges per year = $2\% \times 2.5 \text{ crores} \times 12 = \text{Rs. } 60,00,000$
Savings per year = $(1,75,000+2,25,000) \times 12 = \text{Rs. } 48,00,000$
Net Factoring cost per year = $\text{Rs. } 60,00,000 - \text{Rs. } 48,00,000 = \text{Rs. } 12,00,000$
Annual cost of borrowing Rs. 2.5 crores x 75% i.e. Rs. 1,87,50,000 will be

$$\frac{1,87,50,000 \times 14\% + \text{Rs.}12,00,000}{1,87,50,000} = 20.4\%$$

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=		$\text{Rs.72,00,000} / \text{Rs.60} = 1,20,000$	$1,20,000/60 \times 90 = 1,80,000$

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	$43,20,000 \times 1/12$	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	$68,40,000 \times 2/12$	Rs.11,40,000
Stock of Finished Goods	$93,60,000 \times 2/12$	Rs.15,60,000
Receivables (on sales)		
A	$1,17,00,000 \times 50\% \times 2/12$	Rs.9,75,000
B	$1,17,00,000 \times 30\% \times 3/12$	Rs.8,77,500
C	NIL	-
Cash Balance	Given	Rs.1,11,000
Total Current Assets		Rs. 50,23,500
Current Liabilities		
Payables	$*\text{Rs.44,40,000} \times 2/12$	Rs.7,40,000
Net Working Capital		Rs. 42,83,500

Opening RM stock = $28,80,000 \times 1/12 = \text{Rs.2,40,000}$

* RM purchased = RM consumed – Opening Stock + Closing Stock
 = $\text{Rs.43,20,000} - \text{Rs.2,40,000} + \text{Rs.3,60,000}$
 = 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

QUESTION 3 : PAPER - SEPT 2024

Explain Angel Financing.

SOLUTION :

Angel Financing is a form of an equity-financing in which individual or a group of individuals provides capital to entrepreneurs and early-stage businesses, or start-ups, in exchange for an ownership/equity in the company.

They may provide a one-time investment or an ongoing capital injection via a series of investments, Angel investors are looking for a higher rate of return than what is given by traditional investment

Thanks

CHAPTER

16

CASE SCENARIO

QUESTION 1 : RTP - SEPT 2024

Mr. Ronak, a doctor by profession, has his own private hospital at Goa having specialization in cardiac treatments. However, now-a-days, Goa not only being a place for the tourists, but is also a place for business delegates, cultural people, politicians, students and other classes of people. Gradually, Goa is opening new windows for businesses and getting recognition as an important tourist and leisure hub in South West India.

There are a number of hotels and resorts at Goa. However, the need still exists for more hotel services, in particular with the excellent service, and because of the large number of visitors from all over the country and all walks of life always favour Goa state for their recreation.

Mr. Ronak although being a doctor by profession is contemplating to establish a five-star hotel at Goa. The hotel will consist of 5 floors. The hotel will include 40 normal rooms and 8 deluxe suites, as well as a restaurant and couple of conference rooms with a small wedding hall on the ground floor. Following are the estimated occupancy rate including fare composition in the Table 1. Being a five-star hotel, breakfast would be complementary but lunch and dinner are on a-la-carte basis.

Table 1: Hotel accommodation, estimated occupancy rate and fare.

Types of Facility	Numbers	Occupancy Rate	Average Rent Per Room Per Day	Growth Rate in Rent
Normal Room	40	33% or 120 Days	Rs. 8000	12%
Deluxe Suites	8	33% or 120 Days	Rs. 25,000	9%
Conference with Wedding Hall	2	40 days	Rs. 3,00,000	9%
Restaurant	1	All days	Rs. 27,000 sales per day	8%

For the sake of simplicity in calculation, growth rate to be applied only once after completion of 10 years.

The estimated cost of land will be Rs. 250 million and the construction cost will be Rs. 100 million. The estimated salvage value at the end of 15th year will be 25% of the cost of construction. The

cost of furniture will be of Rs. 1,50,000 for each normal room and Rs. 3,80,000 for each deluxe suite. The cost of the furniture for the conference room with wedding hall will be Rs. 7,00,000 each and for restaurant it will be 10,00,000. In addition, the hotel will require 4 elevators at different locations and will be costing around Rs. 35,00,000 each. The cost of buying and installing electronic appliances like TV sets, Air conditioners, Fridge etc. will be around Rs. 35 million. Elevators would be depreciated at a rate of 5% p.a. Electronic appliances will have a salvage value of 15% of its acquisition cost at the end of 15 years.

The hotel will be built by renowned builder named '**Harihar Infrastructure**'. The builder estimated that building will survive for 15 years. The required furniture will be supplied by the local reputed furniture company named **Veru Furnishings Ltd.** They ensured that furniture will go for 10 years very smoothly. At the end of tenth year, new furniture for normal rooms and deluxe suites will be bought and old furniture for the same will be sold by the hotel owner. The owner of the hotel estimates that he would be able to purchase the required furniture at 15% higher price than the previous purchase price. The salvage values of the furniture at the end of tenth year will be 5% of their purchase prices with no book value remaining. Furniture at restaurant, conference and wedding hall will not require any major changes as such except for minor renovation which will cost Rs. 20,00,000 in total at the end of 12th year. Any scrap generated on account of such renovation will be sold at Rs. 1,75,000.

In order to boost the tourism industry at Goa, the state govt will be granting subsidy of 15% on the initial capex incurred, it will be paid at the time of cost incurred and additional subsidy of 10% on annual revenue expenses for the first 3 years of operation, but will be credited directly in the bank account only at the end of 5th year and the same shall be non-taxable.

The total annual recurring expenses will be Rs. 1,80,00,000/-. It includes salaries to managers, staff and employees, utilities expenses, house keeping and security services' contract, AMC for electronic appliances, restaurant supplies and materials, other miscellaneous expenses, etc.

After the end of 10 years, annual recurring expenses will increase at a rate of 10% which is to be applied once. Furthermore, the hotel authority is determined to provide the best and professional hotel services to the clients by offering training to the employees. They decided to spend Rs. 5,00,000 per year for the purpose of training of the employees.

The hotel project will be entitled to enjoy tax holiday for the first five years after which the corporate tax rate of 25% will also be applied for the hotel. The Cost of equity for the company is 12% and the estimated hurdle rate by considering the structure of capital of the proposed hotel is fixed at 15%.

(Depreciation to be taken on SLM basis and assume 360 days in a year. Ignore depreciation on furniture used in restaurant, conference and wedding hall)

Based on above, please answer to the following MCQs.

- (i) The amount of net initial investment required is:

(a) Rs. 41.044 Crores	(b) Rs. 34.887 Crores
(c) Rs. 6.156 Crores	(d) Rs. 40.74 Crores
- (ii) NPV of the project is:

(a) Rs. 7.0532 Cr	(b) Rs. 8.4029 Cr
(c) Rs. 8.4935 Cr	(d) Rs. 2.4700 Cr
- (iii) Pay Back period of the project to recover the initial investment is:

- (a) 5.12 years (b) 12.02 years
 (c) 11.80 years (d) 4.46 years
 (iv) Estimated Recurring accounting profit/(loss) for first three years are:
 (a) Rs. 7.0928 Cr p.a (b) Rs. 6.9078 Cr p.a
 (c) Rs. 6.9937 Cr p.a (d) Rs. 9.6120 Cr p.a
 (v) IRR of the project is:
 (a) 16.25% (b) 19.39%
 (c) 15% (d) 12%

SOLUTION :

- (i) (b) Rs. 34.887 Crores
 Amount Initial Investment required:
(A) Cost of Land & Construction Cost = 250 + 100 = 350 million i.e. 35,00,00,000
(B) Furniture Cost
 Normal Rooms = 40 x 1,50,000 = 60,00,000
 Suite rooms = 8 x 3,80,000 = 30,40,000
 Conference and wedding halls = 2 x 7,00,000 = 14,00,000
 Restaurant = 10,00,000
(C) Elevators = 4 x 35,00,000 = 1,40,00,000
(D) Electronic Appliances = 3,50,00,000
Gross Investment Required = Rs. 41,04,40,000
Less: 15% Govt Subsidy on Capex = Rs. (6,15,66,000)
Net Initial Investment to be incurred by Hotel = Rs. 34,88,74,000

- (ii) (a) Rs. 7.0532 Cr
 PV of Cash Inflow = Rs. 42.2317 Cr
As per WN - 2
 (-) PV of Cash Outflow = Rs. 35.1785 Cr
As per WN - 1
 NPV = 7.0532 CR

Note: Discounting Rate would be the hurdle rate and not cost of equity as hurdle rate means the overall cost of capital

WN 1 - Calculation of PV of Cash Outflows

		(Rs.)	DF @ 15%	PV (Rs.)
Year 1	Initial Net Investment	4,88,74,000	1.0000	34,88,74,000
At the end of 10th Year				
Year 10	Purchase of new furniture (At 15% higher price)			
	Normal Rooms	69,00,000	0.2472	17,05,680
	Suite Rooms	34,96,000	0.2472	8,64,211
At the end of 12th Year				

Year 12	Renovation at restaurant, conference and wedding halls (Net)	18,25,000	0.1869	3,41,093
				35,17,84,983

WN – 2: Calculation of PV of Cash Inflows

	Year 1 to 5 (Rs.)	Year 6 to 10 (Rs.)	Year 11 to 15 (Rs.)
Sales			(Apply growth rate here)
Normal Rooms	3,84,00,000	3,84,00,000	4,30,08,000
Suites	2,40,00,000	2,40,00,000	2,61,60,000
Conf & Hall	2,40,00,000	2,40,00,000	2,61,60,000
Restaurant	97,20,000	97,20,000	1,04,97,600
Total Sales (A)	9,61,20,000	9,61,20,000	10,58,25,600
Less:			
Annual Recurring Exp (Excl Depreciation)	1,80,00,000	1,80,00,000	1,98,00,000
Training Exp	5,00,000	5,00,000	5,00,000
Depreciation			
Building	50,00,000	50,00,000	50,00,000
Elevators	7,00,000	7,00,000	7,00,000
Electronic App	19,83,333	19,83,333	19,83,333
Furniture (Old)	8,58,800	8,58,800	
Furniture (New)			10,39,600
TOTAL EXP (B)	2,70,42,133	2,70,42,133	2,90,22,933
NPBT (A - B)	6,90,77,867	6,90,77,867	7,68,02,667
(-) Tax	Nil (Tax Holiday)	1,72,69,466	1,92,00,666
NPAT	6,90,77,867	5,18,08,400	5,76,02,000
(+) Depreciation	85,42,133	85,42,133	87,22,933
(+) Cash Inflows from Operation	7,76,20,000	6,03,50,533	6,63,24,933
PVAF@ 15%	3.3522	1.6666	0.8285
PV of Cash Inflows from Operations	26,01,97,764	10,05,80,199	5,49,50,207

(+) PV of Other Cash Inflows

In year 5 - Govt Subsidy on first 3 years of $= 55,50,000 \times 0.4972$
 $= \text{Rs. } 27,59,460$

Annual Revenue Exp

In year 10 - Salvage Value of Old Furniture $= 4,52,000 \times 0.2472$
 $= \text{Rs. } 1,11,734$

In year 15 - Salvage of building and electronic $= 3,02,50,000 \times 0.1229$

appliance

= Rs. 37,17,725

Therefore, **Total PV of Cash Inflows**

= Rs. **42,23,17,089**

(iii) (d)

4.46 years

Total Net Initial Investment Incurred = Rs. 34,88,74,000

Cumulative of Total Cash Inflows (not discounted cash inflows)

Year	Total Cash Inflows (Rs.)	Cumulative of Cash Inflows (Rs.)
1	7,76,20,000	7,76,20,000
2	7,76,20,000	15,52,40,000
3	7,76,20,000	23,28,60,000
4	7,76,20,000	31,04,80,000
5	8,31,70,000 (Govt Subsidy of 55,50,000 added here)	39,36,50,000
6	6,03,50,533	45,40,00,533

From the above table, it can be seen that the initial net investment incurred is getting recovered after 4th year but before the end of 5th year i.e. somewhere between 4th & 5th Year.

Payback period = $4 + \frac{3,83,94,000}{8,31,70,000}$

= 4 + 0.46 = 4.46 years

(iv) (a)

Rs. 7.0928 Cr p.a.

Accounting profit = NPAT + Govt Subsidy on Revenue Expense

= 6,90,77,867 + (1,85,00,000 x 10%)

= 6,90,77,867 + 18,50,000

= 7,09,27,867 per annum

(v) (b)

19.39%

DF @ 15%

NPV = Rs. 7.0532 Cr

DF @ 20%

NPV = 34,10,68,926.17 - 35,07,57,719.00

= (Rs. 0.9688 Cr)

IRR = Lower Rate % + $\frac{\{NPV @ \text{Lower rate \%} \times (\text{Higher Rate \%} - \text{Lower Rate \%})\}}{NPV @ \text{Lower rate \%} - NPV @ \text{Higher Rate \%}}$

IRR = 15 + (7.0532 * 5 / 8.0220)

= 15 + 4.396

= 19.396%

QUESTION 2 : PAPER - SEPT 2024

RS Limited is manufacturing selling soft drinks in India. The production process involves one important process which increases the shelf life of the soft drinks. Presently, the machine used for this purpose is an old one, in which wastage due to breakage of glass bottles is considerably high and due to its limited capacity, the company is not in a position to increase its production.

The production manager has approached the CEO of RS Limited for purchasing an automated machine, which will drastically reduce the wastage due to breakage during the process of increasing shelf life of soft drinks. The automated machine will support increase in production. The production manager is confident that acquisition of the automated machine will be beneficial for the company.

Other information is as under :

- With the introduction of automated machine, additional sales and related costs over the next five years would be as follows:

Year	Additional Sales Unit	Selling price per unit (Rs.)	Variable Manufacturing, Selling and Distribution cost per unit (Rs.)	Additional fixed Selling & Distribution Cost (Rs.)
1	20,000	30	20	25,000
2	25,000	30	20	30,000
3	30,000	35	20	30,000
4	32,000	35	22	35,000
5	28,000	35	22	35,000

- Cost of acquisition of automated machine is Rs. 5,00,000. Residual value of the automated machine at the end of its life of 5 years will be Rs. 50,000. Depreciation on automated machine will be under Straight line method.

Depreciation is not included in the cost stated above.

- The Production Manager has estimated the cost savings (before tax) due to reduction in breakages as under:

	Year 1	Year 2	Year 3	Year 4	Year 5
Savings Cost due reduction in breakages	Rs. 15,000	Rs. 15,000	Rs. 20,000	Rs. 20,000	Rs. 20,000

- The machine which is being used at present has zero written down value and if sold, would fetch an amount of Rs. 10,000 only.
- The cost of capital of the company is 10%. The tax rate applicable for the company is 30%. Ignore capital gain taxes.

P.V Factors of Rs. 1 at year end at 10%:

	Year 1	Year 2	Year 3	Year 4	Year 5
P.V Factor of Rs. 1	0.909	0.826	0.751	0.683	0.621

You are required to answer the following Questions 1 to 5 :

- What is the Profit before Taxes for the Year 2, Year 3 and Year 4 of the investment proposal ?
 (A) Rs. 2,35,000, Rs. 4,40,000, Rs. 4,01,000
 (B) Rs. 1,45,000, Rs. 3,50,000, Rs. 3,11,000
 (C) Rs. 2,05,000, Rs. 4,10,000, Rs. 3,66,000

- (D) Rs. 1,40,000, Rs. 3,60,000, Rs. 3,31,000
2. What is the Cash Inflow after Taxes for the Year 1, Year 2 and Year 3 of the investment proposal ?
 (A) Rs. 1,50,000, Rs. 1,85,000, Rs. 3,45,000
 (B) Rs. 1,65,000, Rs. 1,95,500, Rs. 3,55,000
 (C) Rs. 1,60,000, Rs. 1,91,500, Rs. 3,35,000
 (D) Rs. 1,70,000, Rs. 1,90,000, Rs. 3,40,000
 3. What is the Discounted Cash Inflow after Taxes for the Year 1, Year 2 and Year 3 of the investment proposal ?
 (A) Rs. 1,49,985, Rs. 1,61,483, Rs. 2,66,605
 (B) Rs. 1,36,350, Rs. 1,52,810, Rs. 2,59,095
 (C) Rs. 1,54,530, Rs. 1,56,940, Rs. 2,55,340
 (D) Rs. 1,45,440, Rs. 1,58,179, Rs. 2,51,585
 4. What is the Net Present Value of the investment proposal?
 (A) Rs. 3,78,990.30 (B) Rs. 4,54,980.60
 (C) Rs. 4,74,890.40 (D) Rs. 3,89,260.70
 5. What is the Discounted Payback period of the investment proposal ?
 (A) 2.74 years (B) 2.87 years
 (C) 2.38 years (D) 2.48 years
 6. A company has sales of Rs. 6,00,000, variable cost of Rs. 2,40,000, fixed operating cost of Rs. 2,70,000. The financial leverage is 2.5. The company wants to double its EBIT. The percentage change in sales required in order to double its EBIT will be :
 (A) 50% (B) 25%
 (C) 40% (D) 80%
 7. The capital structure of KPS Limited includes 5,00,000 equity shares of Rs. 10 each. The market price of equity share (cum-dividend) is Rs. 75 per share. The company has declared to pay dividend on equity shares @ Rs. 6 per share which will be paid within next three days. The company has a history of consistent growth in its dividends. It has been predicted that in the next year KPS Limited will pay dividend on its equity shares @ Rs. 7.59 per share. The rate of dividend growth will be maintained in foreseeable future. The cost of equity is calculated as:
 (A) 36.5% (B) 34.5%
 (C) 37.5% (D) 38.5%
 8. ZX Limited has total assets of Rs. 7,20,000 and its Shareholders' equity is Rs. 4,50,000. The net profit margin of ZX Limited is 12.5% and asset turnover ratio is 1.5. Using the DuPont model, the return on equity of ZX Limited is calculated as :
 (A) 7.03% (B) 50%
 (C) 11.72% (D) 30%

SOLUTION :

1.	(B)	2.	(C)	3.	(D)	4.	(C)	5.	(A)	6.	(B)
7.	(C)	8.	(D)								

QUESTION 3 : RTP - JAN 2025

Samvar Ltd, a leading **FMCG** company having its current presence in more than 150 Tier I and Tier II cities in India. The stores are operating in the brand name of **GoMART** competing with Reliance fresh, Walmart, BigBazaar and other chains. Owing to the increase in demand from Tier III cities and rural areas, it is planning for massive expansion and is contemplating to open up additional 50 stores which will have variety of FMCG products.

The CFO and his team estimate that the funds needed for massive expansion would be Rs. 200 lakhs per store. Such funds would be utilized for buying out a space and setting up a store, buying the other required fixed assets, etc. Central government will provide a revenue subsidy of 15% on Gross profit if the overall cost of capital doesn't exceed 10%

Apart from above, CFO and his team require an estimate on the additional capital needed based for the smooth running of fixed assets and its daily operations. Based on their market research, they have collected the other information for each store which is as follows-

Average Sales would be Rs. 120 lakhs p.a. with a GP margin of 18%. Customers pay through different digital modes and channels including POS systems (Debit and credit cards) which generally takes approx. 9 days for the funds to get credited in the bank account. 15% of the customers use debit and credit cards to make the payment. Installing a POS system comes with a fee of 2% of total sales through POS.

Being a FMCG outlet, inventories of multiple products need to be kept. Different products have different storage period. However primarily, products are classified into three broad categories, Durable, Semi Durable & Perishable. Perishable products comprise 60% of sales, whereas semi-durable is 25% and balance is for durable products. Inventory storage period for perishable, semi-durable & durable products are 10 days, 30 days & 60 days respectively. Suppliers of these products provide a credit period of average 30 days.

Each store will employ around 20 personnel of a different hierarchy and monthly average salaries to staff for each store is estimated at Rs. 4 lakhs per month. Company will pay employees' dues on the 1st of next month.

Samvar Ltd plans to keep optimum cash balance in hand as suggested by Baumol's model. Excess cash balance if any, will be invested in the marketable securities which will generate a return of 12% p.a. The total disbursement for the year is estimated at Rs. 1.50 lakhs per month with the transaction cost of Rs. 20 per transfer to the disbursement account.

The optimum capital structure with debt equity of 2:1 has been proven ideal for raising the finance and company wishes to follow the same pattern for the additional funds required for each store. Trade credit can also be utilized for financing the expansion needs.

The cost of raising debt and equity for each store is as per the slabs as under:

Project Cost *	Cost of Debt	Minimum rate expected by equity share holders
Upto 80 lakhs	10%	12.50%
Above 80 lakhs but upto 150 Lakhs	11.50%	13.50%
Above 150 lakhs & Upto 250 lakhs	12%	14%
Above 250 lakhs	13.50%	15%

*It means that upto 80 lakhs of project cost company can raise debt at 10% and equity at 12.5% and so on.

Tax rate applicable to the corporate is 25%

Based on the above details, calculate the following for each store:

- i. The optimum Cash balance is

(A) Rs. 7,071	(B) Rs. 26,500
(C) Rs. 7,150	(D) Rs. 24,495
- ii. The Gross and Net Working Capital for the next year would be

(A) Rs. 6.7730 L, (5.9396 L)	(B) Rs. 6.7730 L, 12.7125 L
(C) Rs. 200 L, (5.9396L)	(D) Rs. (5.9396 L), 6.7730 L
- iii. The amount of total funds needed to setup a store is

(A) Rs. 194.0605 L	(B) Rs. 200 L
(C) Rs. 6.7730 L	(D) Rs. 206.7730 L
- iv. The overall cost of capital for raising additional funds for setting up of each store is

(A) 10.01%	(B) 10.65%
(C) 9.90%	(D) 8.91%
- v. The amount of revenue subsidy granted by the central govt is

(A) Rs. 3 L	(B) Rs. 3.24 L
(C) Nil	(D) Rs. 2.25 L

SOLUTION :

- i. **(D) Rs. 24,495**

As per William J Baumol,

$$\text{optimum cash balance} = \sqrt{\frac{2AT}{O}}$$

A = Annual Cash disbursement

T = Cost per transfer

O = Opportunity cost

$$= \sqrt{\frac{2 \times 18,00,000 \times 20}{0.12}} = \text{Rs. 24,495/-}$$

- ii. **(A) Rs.6.7730 L, (5.9396 L)**

Gross working capital is sum of total current assets and net working capital is Gross working capital less current liabilities.

Estimation of Working Capital Statement

	Amount (Rs.)	Amount (Rs.)
A) CURRENT ASSETS / GROSS W.C		
1. FG Inventory WN – 1	6,15,000	
2. Trade receivables WN – 2	37,800	
3. Cash/ bank balance (Calculated in Solution 1)	24,495	6,77,295
B) CURRENT LIABILTIES		

1.	Trade payables	WN - 3	8,71,250	
2.	Outstanding salaries	WN - 4	4,00,000	12,71,250
NET WORKING CAPITAL (A) - (B)				(5,93,955)

WN – 1 Calculation of FG Inventory

$$\text{FG Inventory} = \text{COGS} \times \frac{\text{FG STORAGE PERIOD (DAYS)}}{360}$$

$$\text{COGS} = 120 \text{ Lakhs} \times 82\% = 98.40 \text{ Lakhs}$$

$$\text{Perishable} = 98.40 \times 60\% \times 10 / 360 = 1.64 \text{ Lakhs}$$

$$\text{Semi Durable} = 98.40 \times 25\% \times 30 / 360 = 2.05 \text{ Lakhs}$$

$$\text{Durable} = 98.40 \times 15\% \times 60 / 360 = 2.46 \text{ Lakhs}$$

$$\text{Total} = \text{Rs. } \mathbf{6.15 \text{ lakhs}}$$

WN – 2 Calculation of Trade Receivables

Since, company is into FMCG industry, sales are always on cash basis as no credit is given to any of the customer. However, as mentioned in the case study, company will get the credit in the bank account only after 9 days for those customers that pay through POS (debit and credit cards). It means companies funds' get blocked for 9 days.

Company's trade receivable would only comprise of 15% of total sales as rest are through cash basis

$$\begin{aligned} \text{Trade Receivables} &= \text{Cost of Sales} \times \text{Days Blocked} / 360 \\ &= 15.12 \text{ L} \times 9 / 360 \\ &= \mathbf{0.378 \text{ Lakhs}} \end{aligned}$$

$$\begin{aligned} \text{Cost of Sales} &= \text{COGS} + \text{POS Transaction fees} \\ &= (98.40 \text{ L} \times 0.15) + (120 \text{ L} \times 0.15 \times 2\%) \\ &= 15.12 \text{ Lakhs} \end{aligned}$$

WN – 3 Calculation of Trade Payables

$$\begin{aligned} \text{Trade Payables} &= \text{Purchases} \times \frac{\text{Average Credit period in days}}{360} \\ &= 104.55 \times 30 / 360 \\ &= \mathbf{8.7125 \text{ Lakhs}} \end{aligned}$$

$$\text{Purchases} = \text{COGS (+) Closing Stock (-) Opening Stock}$$

Since, company is planning to open up new store, its opening stock would be NIL but there would be definitely a closing FG stock which is calculated in WN -1

$$\text{Therefore, Purchases} = 98.40 \text{ L} + 6.15 \text{ L} - 0 = \mathbf{104.55 \text{ Lakhs}}$$

WN – 4 Calculation of Outstanding salaries

Salaries are paid on 1st of next month, thereby meaning it has been outstanding for a period of 30 days assuming salaries accruing evenly throughout.

$$\begin{aligned} \text{Outstanding salaries} &= 48,00,000 \times 30 / 360 \\ &= \mathbf{4,00,000} \end{aligned}$$

iii. (A) **Rs. 194.0605 L**

$$\begin{aligned} \text{Total Capital needed} &= \text{Total capital needs (Fixed assets)} + \text{Working Capital needs} \\ &= 200 \text{ L} + (5,93,955) \\ &= \mathbf{Rs. 194.0605 L} \end{aligned}$$

iv. (C) 9.90%

Samvar Ltd would require financing of Rs. 194.0605 lakhs from debt and equity and not Rs. 200 lakhs as trade credit is also considered to be a source of finance as mentioned in the case study.

Furthermore, the overall cost of raising this additional fund for each store of Rs. 194.0605 needs to be calculated slab wise

Project Cost	Weights (W)	Cost (K)	W X K	Total cost (Rs.)
Upto 80 Lakhs	Debt = 0.67 Equity = 0.33	Kd = 10 (1 - 0.25) = 7.5 Ke = 12.5	Ko = 9.167%	= 80L x 9.167% = 7.334 Lakhs
Above 80 L upto 150 L	Debt = 0.67 Equity = 0.33	Kd = 11.5(1-0.25) = 8.625 Ke = 13.5	Ko = 10.25%	= 70L x 10.25% = 7.175 Lakhs
Above 150 L upto 250 L	Debt = 0.67 Equity = 0.33	K = 12 (1-0.25) = 9 Ke = 14	Ko = 10.667%	= 44.0605L x 10.667% = 4.7Lakhs

Total Funds = 194.0605 L

Total Cost (Rs.) = 7.334 L + 7.175 L + 4.700 L = 19.209 L

Ko = Total Cost (Rs.) / Total Funds

= 19.209 / 194.0605

= **9.90%**

v. (B) Rs. 3.24 L

Since the Overall Cost of Capital is below 10%, Samvar Ltd is eligible for revenue subsidy

Revenue Subsidy = GP x 15%

= 21.6 L x 15%

= **Rs. 3.24 Lakhs**

QUESTION 4 : PAPER - JAN 2025**Case Scenario - I**

Coral Ltd. is an agri-business company that operates in two segments - animal feed and crop protection. The company's Research and Development Department has been instrumental in its growth and success.

The existing capital structure of Coral Ltd. is as follows:

Particulars	Amount (Rs.)
Equity Shares (10,00,000 shares of Rs. 10 each)	1,00,00,000
15% Debentures (30,000 Debentures of Rs. 100 each)	30,00,000

Coral Ltd. desires to expand its horizon in breeding high-yielding and disease-resistant seeds for increasing agricultural productivity. The company requires additional funds amounting Rs. 100

lakh to finance its business expansion plan. The expected earnings before interest and taxes after this additional investment will be Rs. 76 lakh. The applicable corporate income tax rate is 30%. The company has two alternatives for raising this additional fund:

Particulars	Plan - I	Plan – II
Equity shares of Rs. 10 each to be issued at a premium of Rs. 15 per share	30%	10%
13% Debentures of Rs. 100 each to be issued at par	70%	50%
7.15% Preference Shares of Rs.10 each to be issued at par	-	40%

You are required to answer the following questions 1 to 5:

- What would be the Earnings Per Share (EPS) of the company in Plan-I and Plan-II?
 (A) Rs. 4.37 and Rs.4.26 (B) Rs. 3.36 and Rs. 3.88
 (C) Rs. 3.90 and Rs. 4.10 (D) Rs. 4.25 and Rs. 4.50
- What would be the Market Price per Share (MPS) of the company if Price Earnings Ratio (PE ratio) in Plan-1 is 12 times and Plan-II is 15 times?
 (A) Rs. 46.80 and Rs. 61.50 (B) Rs. 40.32 and Rs. 58.20
 (C) Rs. 51.00 and Rs. 67.50 (D) Rs. 52.44 and Rs. 63.90
- What would be the financial Break Even Point (BEP) in Plan-I and Plan-II?
 (A) Rs. 13,75,000 and Rs. 15,10,000 (B) Rs. 13,70,000 and Rs. 15,00,000
 (C) Rs. 13,65,000 and Rs. 15,15,000 (D) Rs. 13,60,000 and Rs. 15,08,571
- What would be the indifference point between Plan-1 and Plan-II?
 (A) Rs. 34,33,333 (B) Rs. 34,40,000
 (C) Rs. 35,15,000 (D) Rs. 35,22,222
- What would be the Earnings Per Share (EPS) in Plan-1 and Plan-II at the indifference point as calculated by you above?
 (A) Rs. 1.30 and Rs. 1.30 (B) Rs. 1.65 and Rs. 1.75
 (C) Rs. 1.50 and Rs. 1.50 (D) Rs. 1.80 and Rs. 1.90

Case Scenario - II

VP Ltd. provides the following financial information:

Current Ratio	1.5:1
Sales (80% Credit Sales)	Rs. 150 Lakh
Inventory Turnover Ratio	6 Times
Average Collection Period	2 months
Gross Profit Ratio	20%
Quick Ratio	01:01

From the information given above, choose the correct answer to the following Q. No. 6 and 7:

- Inventory and Receivables would be:
 (A) Rs. 20 Lakh and Rs. 20 Lakh (B) Rs. 10 Lakh and Rs. 10 Lakh
 (C) Rs. 10 Lakh and Rs. 20 Lakh (D) Rs. 20 Lakh and Rs. 10 Lakh
- Current Assets and Current Liabilities would be:
 (A) 30 Lakh and 20 Lakh (B) 45 Lakh and 30 Lakh
 (C) 60 Lakh and 40 Lakh (D) 75 Lakh and 50 Lakh

8. JKL Company Ltd. has current assets of Rs. 1,00,00,000 and current liabilities of Rs. 50,00,000. The Financial manager of the company desires to make a provision for contingencies @20% of working capital. Accordingly, what would be the amount of working capital requirement for the company?
- | | |
|-----------------|-----------------|
| (A) Rs. 55 Lakh | (B) Rs. 60 Lakh |
| (C) Rs. 65 Lakh | (D) Rs. 70 Lakh |

Case Scenario - III

Primo Neo Logistics (PNL) is engaged in transportation of goods in India. It has its operational presence across the country since the year 2010. In addition to transporting goods by road, company is also taking services of private airways as its logistics partner. However, there is a sharp decline in business through airways as sales and profits have declined steeply.

Company also wants to ascertain the market positions of rival companies having similar competitive approaches in the market with the intent to identify the strongest or the weakest players in view of the tough competitive landscape. Once the market position is ascertained, company would like to modify its strategy to adapt according to the changing circumstances.

Technology, means and ways of transporting goods are also changing. Company wants to utilize its resources and capabilities, not only to compete and survive but to grow efficiently. Multidimensional expansion with new and improved means of transportation and marketing seems inevitable. Company has strong presence in transporting goods by road and wants to collaborate with some other operator who can bring expertise in transporting goods using improved technology.

Cargo Movers Plc. (CMP) is a well-known transporter of goods using state of art technology in the Asia Pacific region. Banking upon their respective core competencies, PNL and CMP would like to develop close and collaborative relationship where both will continue to maintain their respective independent existence. Once collaboration is in place, marketing team of both the companies would like to cater to the needs of transporting goods with speed and agility. In line with basic principles, the team will also focus on best long- run performance of the marketing system. In view of the same the team is planning to rope in various social media influencers with intent to create a brand image with customer orientation and spreading a word about its distinctive services to its present and prospective customers.

Based on the above case scenario, choose the correct answer to Q. Nos. 9 to 13.

9. The business through private airways is at which phase of product life cycle?
- | | |
|------------------|-------------|
| (A) Introduction | (B) Growth |
| (C) Maturity | (D) Decline |
10. Tool for identifying the strongest and weakest competitors is known as:
- | | |
|-----------------------------|------------------------|
| (A) Strategic Group Mapping | (B) Portfolio Analysis |
| (C) Strategic Surveillance | (D) Strategic Audit |
11. The strategy being followed by PNL is:
- | |
|--|
| (A) Adaptive strategy |
| (B) Proactive strategy |
| (C) Reactive strategy |
| (D) Blend of proactive and reactive strategy |

12. Relationship being considered between PNL and CMP is indicating:
 (A) Horizontal Integration (B) Merger and Acquisition
 (C) Strategic Alliance (D) Vertical Integration
13. The activity of marketing team will be called as:
 (A) Enlightened marketing (B) Augmented marketing
 (C) Differential marketing (D) Synchro marketing
14. Farm Fresh Ltd., a family-owned organic farming business has been operating successfully over the past 10 years. Currently the company is facing stiff competition from the large farming houses. Hence to maintain status quo, the management of the company decided to adopt stability strategy. Which of the following initiatives best support Farm Fresh Ltd.'s stability strategy?
 (A) Develop a new range of organic produce to attract a new segment of customers.
 (B) Improve functional efficiency of its farm equipment to increase productivity and reduce cost of production.
 (C) Purchase a number of farms to increase production.
 (D) Add a few channels of distribution to attract customers in related market areas.
15. The role played by middle management is diminishing as the tasks performed by them are increasingly being replaced by new and improved technological tools. As a result, in a three layer organizational structure, middle level is constricted.
 Which one of the following is a suitable name to such structure?
 (A) Hourglass structure (B) Network Structure
 (C) Matrix structure (D) Divisional structure
16. In the framework of strategic analysis, which one is a constituent of internal analysis?
 (A) Competitor analysis (B) Determinants analysis
 (C) Market analysis (D) Scenario analysis

SOLUTION :

1. (C) 2. (A) 3. (D) 4. (B) 5. (A) 6. (A) 7. (C)
 8. (B) 9. (D) 10. (A) 11. (D) 12. (C) 13. (A) 14. (B)
 15. (A) 16. (B)

QUESTION 5 : RTP - MAY 2025

Linty is a small-sized firm manufacturing company. Its manufacturing plant is situated in Chattisgarh. Currently, company is labour oriented due to which there is less production, delay in deliveries and more defects in production. The management of the company is considering the proposal to purchase a new automatic machine which will carry out some operations which are at present performed by manual labour. There are two alternative models of the machine that are available in the market. Machine TMT 1 and TMT 2. If machine is replaced, it would provide labor saving and reduce the defects as well. It is expected to have to have an economic life of 10 years for both the models. The following details are collected:

	Machine	
	TMT 1 (Rs.)	TMT 2 (Rs.)

Cost of Machine	45,00,000	50,00,000
Estimated saving in direct wages per annum	15,00,000	20,00,000
Estimated saving in scrap per annum	5,00,000	6,00,000
Estimated additional cost of indirect material per annum	2,00,000	2,00,000
Estimated additional cost of indirect labour per annum	1,50,000	1,80,000
Estimated additional cost of repairs and maintenance per annum	4,00,000	8,00,000

Depreciation is charged using straight line method over the useful life. Company is in 35 percent tax bracket and expected rate of return may be 15 percent.

Being a finance manager of the company, you are required to evaluate the alternatives by answering the followings:

- What is the annual saving from Machine TMT 1?
 - Rs. 5,20,000
 - Rs. 5,98,000
 - Rs. 9,70,000
 - Rs. 10,98,000
- What is the annual saving from Machine TMT 2?
 - Rs. 5,20,000
 - Rs. 5,98,000
 - Rs. 9,70,000
 - Rs. 10,98,000
- What is the payback period of Machine TMT 1 and TMT 2 Respectively?
 - 3.60 years and 4.60 years
 - 4.25 years and 4.42 years
 - 4.63 years and 4.55 years
 - 4.55 years and 4.42 years
- What is the Accounting (Average) Rate of Return of Machine TMT 1 and TMT 2 Respectively?
 - 20% and 22%
 - 23.11% and 23.92%
 - 22.21% and 23.11%
 - 23.92% and 22.21%
- What is the Profitability Index (PI) of Machine TMT 1 and TMT 2 Respectively?
 - 1.10 and 1.05
 - 0.98 and 1.01
 - 1.19 and 1.08
 - 1.08 and 1.10

SOLUTION :

i. A. Rs. 5,20,000

ii. B. Rs. 5,98,000

Working Notes:

$$\begin{aligned}\text{Depreciation on Machine TMT 1} &= \frac{45,00,000}{10} \\ &= \text{Rs. } 4,50,000 \\ \text{Depreciation on Machine TMT 2} &= \frac{50,00,000}{10} \\ &= \text{Rs. } 5,00,000\end{aligned}$$

Particulars	Machine TMT 1 (Rs.)	Machine TMT 2 (Rs.)
Annual Savings:		

Direct Wages	15,00,000	20,00,000
Scraps	5,00,000	6,00,000
Total Savings (A)	20,00,000	26,00,000
Annual Estimated Cash Cost :		
Indirect Material	2,00,000	2,00,000
Indirect Labour	1,50,000	1,80,000
Repairs and Maintenance	4,00,000	8,00,000
Total Cost (B)	7,50,000	11,80,000
Annual Cash Savings (A-B)	12,50,000	14,20,000
Less: Depreciation	4,50,000	5,00,000
Annual Savings before Tax	8,00,000	9,20,000
Less: Tax @ 35%	2,80,000	3,22,000
Annual Savings /Profits after tax	5,20,000	5,98,000
Add: Depreciation	4,50,000	5,00,000
Annual Cash Inflows	9,70,000	10,98,000

iii. C. 4.63 and 4.55 years

$$\text{Payback Period} = \frac{\text{Total Initial Capital Investment}}{\text{Annual expected after tax net cashflow}}$$

$$\begin{aligned} \text{Machine TMT 1} &= \frac{45,00,000}{9,70,000} \\ &= 4.63 \text{ years} \end{aligned}$$

$$\begin{aligned} \text{Machine TMT 2} &= \frac{50,00,000}{10,98,000} \\ &= 4.55 \text{ years} \end{aligned}$$

iv. B. 23.11% and 23.92%

$$\text{Accounting (Average) Rate of Return (ARR)} = \frac{\text{Average Annual Net Savings}}{\text{Average investment}}$$

$$\begin{aligned} \text{Machine TMT 1} &= \frac{5,20,000}{22,50,000} \times 100 \\ &= 23.11\% \end{aligned}$$

$$\begin{aligned} \text{Machine TMT 2} &= \frac{5,98,000}{25,00,000} \times 100 \\ &= 23.92\% \end{aligned}$$

v. D. 1.08 and 1.10

$$\begin{aligned} \text{Present Value Cash Inflow} &= \text{Annual Cash Inflow} \times \text{PV factor at 15\% Machine TMT 1} \\ &= 9,70,000 \times 5.019 = \text{Rs. } 48,68,430 \end{aligned}$$

$$\text{Machine TMT 2} = 10,98,000 \times 5.019 = \text{Rs. } 55,10,862$$

$$\text{Profitability Index or PV Index} = \frac{\text{Present Value of Cash Inflow}}{\text{Investment}}$$

$$\text{Machine TMT 1} = \frac{48,68,430}{45,00,000}$$

$$\begin{aligned}
 &= 1.08 \\
 \text{Machine TMT 2} &= \frac{55,10,862}{50,00,000} \\
 &= 1.10
 \end{aligned}$$

QUESTION 6 : PAPER - MAY 2025

Case Scenario - I

XYZ Ltd. wants to establish a shoe manufacturing unit. To setup this unit, it needs a loan. XYZ Ltd, approaches a commercial bank for working capital loan.

Bank has asked the company to present the proposal for such loan. To prepare such proposal, the company has appointed you and provided some information about the plan.

It wants to maintain margin of safety of 10% for contingencies. The company want to keep cash balance of Rs. 90,000.

The product will be sold at gross profit margin of 25% on COGS. Depreciation will be part of cost of production.

Stock of raw material will be held at 1.5 months of its consumption, while finished goods inventory will be maintained at one month's requirement. Finished goods will be valued at manufacturing cost.

The company will sell shoes in domestic as well as in foreign market. Total estimated annual sales will be Rs. 30,00,000. 20% of the sales are foreign sales and there will be a delay of 1/2 month to realise the sales proceed from foreign debtors. All domestic sales will be on credit and allowed a credit period of 2 months.

Raw material consumed will be 25% of estimated sales and the company will get credit period of 2 months of consumption from its supplier of raw material. Wage expenses will be 20% of sales and will be paid in 1/2 month's lag.

Outstanding cash manufacturing overhead expenses at the end of the year will be Rs. 60,000; it will be paid in one month arrear. Estimated total administrative cost (to be paid after one month) will be Rs. 1,80,000. Expected annual sales promotion expenses are Rs. 90,000, which will be paid quarterly in advance. The company want to submit the proposal to bank on cash cost basis.

You are required to answer the following question 1 to 5:

- What will be the total manufacturing cost and total cost of sales on cash cost basis?
 (A) Rs. 20,70,000, Rs. 23,40,000 (B) Rs. 24,00,000, Rs. 30,00,000
 (C) Rs. 22,50,000, Rs. 23,40,000 (D) Rs. 16,80,000, Rs. 24,00,000
- What will be the total estimated finished goods inventory and total debtors on cash cost basis?
 (A) Rs. 2,00,000, Rs. 4,25,000 (B) Rs. 1,72,500, Rs. 3,40,000
 (C) Rs. 1,72,500, Rs. 3,31,500 (D) Rs. 1,87,500, Rs. 3,31,500
- What will be the total estimated current assets on cash cost basis?
 (A) Rs. 8,31,250 (B) Rs. 7,18,750
 (C) Rs. 7,25,250 (D) Rs. 7,10,250
- What will be the total estimated current liabilities?
 (A) Rs. 2,52,500 (B) Rs. 1,90,000
 (C) Rs. 2,17,500 (D) Rs. 2,25,000

5. What will be the estimated working capital to be submitted by you in the proposal?
 (A) Rs. 5,33,775 (B) Rs. 4,36,725
 (C) Rs. 5,50,275 (D) Rs. 4,50,225
6. A company has net worth of Rs. 5,00,000. Its debt to equity ratio is 2. Interest on debt is 10%. The company earns an operating profit of Rs. 4,00,000. Tax rate is 30%.
 What will be the financial leverage of the company?
 (A) 1.11 (B) 1.33
 (C) 1.43 (D) 1.90
7. T Ltd. is looking for a capital project in order to replace its existing old machine. It got two proposals to consider; details of which are given below:

	Proposal X	Proposal Y
Initial investment	Rs. 6,50,000	Rs. 7,80,000
Estimated useful life	5 Years	3 Years
Annual cash inflows	Rs. 1,90,000	Rs. 3,50,000
Cost of capital	10%	10%

Year	1	2	3	4	5
PVIF _{0.10, t}	0.909	0.826	0.751	0.683	0.621
PVIFA _{0.10, t}	0.909	1.736	2.487	3.170	3.791

What will be Equivalent Annual NPV for Proposal X and Proposal Y?

- (A) Rs. 70,290.00, Rs. 90,450.00
 (B) Rs. 18,541.28, Rs. 36,369.12
 (C) Rs. 1,90,000.00, Rs. 3,50,000.00
 (D) Rs. 77,326.73, Rs. 99,504.95
8. Q Ltd. is planning to pay dividend of Rs. 2 per share in next year. Growth rate of company is 8% p.a. Current market price per share is Rs. 51. Flotation cost is Rs. 1 per share.
 What will be cost of equity?
 (A) 12.23% (B) 11.92%
 (C) 12.00% (D) 12.32%

Case Scenario - II

A team of professionals having expertise in the areas of Artificial Intelligence (AI), Block Chain (BC), Cloud Computing (CC) and Data Mining (DM) formed a company in the name and style of M/s. ABCD Ltd. (the company).

The aim of the company is to position itself as the best service provider in its area of operations with best user experience to its customer. Concentrating on its resources and capabilities, the company wants to target 8% year-on-year growth in revenue and 9% year-on-year growth in net profit in its business plan.

In order to identify right approach to select and implement the strategy, the company has decided to conduct in depth strategic analysis on strategic groups, objectives, performance and cost structure of companies having similar operations in the market.

In the month of March 2025, the Board of Directors of the company thought it proper to be in the business of manufacturing Robots and providing services relating thereto. The company

knows that there is no linkage between existing and proposed business with specific reference to product or market or technology.

As per proposed arrangement, majority of the components of Robots will be imported from M/s. Faisla Inc. (FI), an established player in this area. The Robots will be assembled in India specifically for use at homes and in restaurants.

The company will endeavor to provide the above product while using cutting-edge technology with customized features and best of the services. The core intent will be to elevate the same to unprecedented level. In this context, the company would like to offer additional facilities like: better customer interface, online repair service and services on site to its customer.

In addition, company is of a considered view that meticulous analysis of its stakeholders will facilitate to build and maintain strong relationship with each group. As an accepted practice, greatest efforts are in place to satisfy Mr. X, the

Chief Executive Officer of the company by taking his advice and keeping him informed with all related information and developments on a regular basis.

Based on above case scenario, choose the correct option for MCQ number 9 to 13:

9. In order to position itself as the best service provider, stating year-on-year growth, indicates which one of the components of the strategic intent?

(A) Goals	(B) Objectives
(C) Mission	(D) Vision
10. Analysis of strategic groups and cost structure can be termed as, which type of strategic analysis?

(A) Competitor analysis	(B) Determinants analysis
(C) Environmental analysis	(D) Market analysis
11. Entering into business of manufacturing of Robots can best be described as:

(A) Backward vertical integration	(B) Co-generic diversification
(C) Conglomerate diversification	(D) Divestment
12. Elevating customer service to unprecedented level by providing better customer interface, online repair service and service on site is known as:

(A) Augmented marketing	(B) Enlightened marketing
(C) Social marketing	(D) Synchro marketing
13. While preparing a Power Interest matrix of stakeholders, the position of Mr. X will be categorized in which one of the following quadrants?

(A) Key player	(B) Keep satisfied
(C) Keep informed	(D) Low priority
14. In response to a scheme of subsidy by the state government, a company started manufacturing E-Vehicles. Some of the customers were not at ease with battery life and time consumed in recharging the battery. Some of the customers were apprehensive about frequent incidents of battery catching fire. All these resulted in half-hearted response from the customers in evolving EV market.
Here, the customers' response is indicating towards which one of the limitations of strategic management?

(A) Environment is highly complex and turbulent.
(B) Strategic management is a time-consuming process.

- (C) Strategic management is a costly process.
- (D) It is difficult to estimate the competitive response to the firm's strategy.
15. M/s. A is providing mobile phones and Wi-Fi services in the country. M/s. B and M/s. C are other similar service providers already in operation. In competitive landscape, M/s. B and M/s. C decided to merge with each other. Such merger was an unexpected development in the industry. M/s. A decided to cope-up with such eventuality by intense review of its strategy and to form a core group to handle the situation.
- The situation where intense review of strategy is needed due to merger between M/s. B and M/s. C, indicates towards which type of strategic control for M/s. A?
- (A) Premise control (B) Implementation control
- (C) Strategic surveillance (D) Special alert control
16. M/s. SPG is a multi-product multi-business enterprise. It has four prominent divisions. Each division functions as an independent product center with its own set of activities managed by respective division head, which is responsible for its own performance and profitability. This organizational structure is known as:
- (A) Divisional structure (B) Multi divisional structure
- (C) Strategic Business Unit (D) Network structure

SOLUTION :**Case Scenario - I**

MCQ. No.	Correct Answer	MCQ. No.	Correct Answer
1	A	5	A
2	C	6	B
3	D	7	B
4	D	8	C

Case Scenario - II

MCQ. No.	Correct Answer	MCQ. No.	Correct Answer
9	B	13	A
10	A	14	A
11	C	15	D
12	A	16	C

QUESTION 7 : RTP - SEPT 2025

Mint Technologies, a startup in the IT infrastructure space, is planning to enter the computer networking market with a specialized offering—VPN connectivity solutions for enterprises with distributed office networks. The company recently won a significant tender from a major national bank to set up secure VPN connections across 100 branches. The leadership team is excited but cautious, as this move requires significant upfront investment and ongoing operational capability. To evaluate the financial viability of this project, you have been hired as a consultant.

- They have forecasted their numbers for 5 years and they have assumed that they will grow at industry average (3%) afterwards.

- Mint will invest all the money for CAPEX in the infrastructure and equipment. Mint is planning to issue 50Mn shares in lieu of the amount.
- Mint will have to keep upgrading the infrastructure and equipment to cover different offices of various clients.
- Mint expects an initial investment of around Rs. 150 Mn in network access as an initial setup cost for connecting different offices. Mint needs to invest additional Rs.10 Mn every year starting from beginning and is expected to grow 10% every year.
- The equipment investment varies with number of branches/offices. This varies with time and currently it is Rs. 0.1 Mn per office.
- Initially, Mint has won a tender of 100 branches of a bank and expecting it to grow at 30% for next 5 years.
- Mint is expecting to have a maintenance cost of 10% for equipment and 15% for network.
- To handle all this, current manpower cost is Rs. 1 Mn
- Mint has entered into an agreement with local authority and has agreed to share 15% of the revenue with the same.
- Mint is expecting to generate revenue of Rs. 0.5 Mn per office and to remain competitive in the market, it is not going to increase with inflation.
- Capital expenditure and operating expenses will grow 10% every year.
- Tax slab in the country is 30% and depreciation of the equipment and network is assumed to be 10%. Discounting rate is 20%.
- Assume all the expenditure including initial setup cost from year 1.

Based on the above information, you are required to answer following 5 MCQs:

- What is the CFAT for year 1?

(a) -15,33,50,000	(b) 1,00,17,000
(c) 1,75,73,810	(d) 2,74,29,367
- What is the CFAT for year 5?

(a) -15,33,50,000	(b) 1,00,17,000
(c) 4,02,25,268	(d) 2,74,29,367
- Calculate the terminal value

(a) Rs. 24,37,17,801	(b) Rs. 9,79,74,556
(c) Rs. 6,38,54,064	(d) Rs. 21,32,20,955
- What is the total present value of the mint technologies?

(a) Rs. 1,89,77,337	(b) Rs. 1,32,20,955
(c) Rs. 1,67,06,548	(d) Rs. 89,97,791
- Calculate the IRR for the company

(a) 22.60%	(b) 15.39%
(c) 20.25%	(d) 24.68%

SOLUTION :

Q. No.		Hints
1	(i)	(a) -15,33,50,000
	(ii)	(c) 4,02,25,268

	(iii)	(a)	Rs. 24,37,17,801
	(iv)	(c)	Rs. 1,67,06,548
	(v)	(d)	24.68%

Calculation of CFAT

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Number of Offices (A)	100	130	169	219*	284*
Revenue Per office (B)	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000
Total Revenue (C) (A x B)	5,00,00,000	6,50,00,000	8,45,00,000	10,95,00,000	14,20,00,000
Operating Cost					
Share of Local Authority	75,00,000	97,50,000	1,26,75,000	1,64,25,000	2,13,00,000
Manpower Cost	10,00,000	14,30,000	20,44,900	29,14,890	41,58,044
Maintenance Cost for Equipment	10,00,000	13,30,000	18,01,900	24,67,400	34,19,065
Maintenance Cost for Network	2,40,00,000	2,56,50,000	2,74,65,000	2,94,61,500	3,16,57,650
Total Operating Cost (D)	3,35,00,000	3,81,60,000	4,39,86,800	5,12,68,790	6,05,34,759
EBITDA (E) (C-D)	1,65,00,000	2,68,40,000	4,05,13,200	5,82,31,210	8,14,65,241
Less: Depreciation	1,70,00,000	1,84,30,000	2,01,11,900	2,21,08,400	2,45,24,165
EBIT (F)	-5,00,000	84,10,000	2,04,01,300	3,61,22,810	5,69,41,076
Less: Taxes	-1,50,000	25,23,000	61,20,390	1,08,36,843	1,70,82,323
PAT (G)	-3,50,000	58,87,000	1,42,80,910	2,52,85,967	3,98,58,753
Add: Depreciation	1,70,00,000	1,84,30,000	2,01,11,900	2,21,08,400	2,45,24,165
CFAT (H)	1,66,50,000	2,43,17,000	3,43,92,810	4,73,94,367	6,43,82,918
Less: Capex	17,00,00,000	1,43,00,000	1,68,19,000	1,99,65,000	2,41,57,650
Net CFAT (I)	-15,33,50,000	1,00,17,000	1,75,73,810	2,74,29,367	4,02,25,268

***Note:** Since offices cannot be represented in fractions, the number should be rounded down to the nearest whole number.

Working Note

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Cost					
Manpower Cost (With Inflation)	10,00,000	11,00,000	12,10,000	13,31,000	14,64,100
Manpower Cost per office (With Inflation)	10,000	11,000	12,100	13,310	14,641
CAPEX					
Additional Branches	100	30	39	50	65
Network CAPEX w/o inflation	16,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000
Network CAPEX With inflation	16,00,00,000	1,10,00,000	1,21,00,000	1,33,10,000	1,46,41,000
Additional Equipment CAPEX/Branch (with inflation)	1,00,000	1,10,000	1,21,000	1,33,100	1,46,410
CAPEX Schedule					
Network Capex	16,00,00,000	1,10,00,000	1,21,00,000	1,33,10,000	1,46,41,000
Cumulative Capex in Network	16,00,00,000	17,10,00,000	18,31,00,000	19,64,10,000	21,10,51,000
Additional Equipment CAPEX (in the Year)	1,00,00,000	33,00,000	47,19,000	66,55,000	95,16,650

Cumulative Additional Equipment CAPEX	1,00,00,000	1,33,00,000	1,80,19,000	2,46,74,000	3,41,90,650

Terminal Value (TV) using Gordon Growth Model (GGM)

$$\begin{aligned} \text{Terminal Value} &= \frac{\text{Terminal Year Cash Flow} \times (1+g)}{K_e - g} \\ &= \frac{4,02,25,268(1+0.03)}{20\% - 3\%} = \text{Rs. } 24,37,17,801 \end{aligned}$$

Calculation of Total PV

Year	CF	PVAF@20%	PV
1	-15,33,50,000	0.833	-12,77,86,555
2	1,00,17,000	0.694	69,51,798
3	1,75,73,810	0.579	1,01,75,236
4	2,74,29,367	0.482	1,32,20,955
5	4,02,25,268	0.402	1,61,70,558
5	24,37,17,801	0.402	9,79,74,556
Total PV			1,67,06,548

Calculation of IRR

Year	Cash Flows	PVAF@20%	PV	PVAF@25%	PV
1	-15,33,50,000	0.8333	-12,77,86,555	0.8	-12,26,80,000
2	1,00,17,000	0.694	69,51,798	0.64	64,10,880
3	1,75,73,810	0.579	1,01,75,236	0.512	89,97,791
4	2,74,29,367	0.482	1,32,20,955	0.41	1,12,46,040
5	4,02,25,268	0.402	1,61,70,558	0.328	1,31,93,888
5	24,37,17,801	0.402	9,79,74,556	0.262	6,38,54,064
			1,67,06,548		-1,89,77,337

$$\text{IRR} = L + \frac{\text{NPV}_L}{\text{NPV}_L + \text{NPV}_H} (H - L)$$

H = Higher rate = 25%

L = Lower rate = 20%

$$\begin{aligned} \text{IRR} &= \frac{1,67,06,548}{1,67,06,548 - (-1,89,77,337)} (25 - 20) \\ &= 20 + 4.68 = 24.68\% \end{aligned}$$

QUESTION 8 : PAPER - SEPT 2025

Case Scenario - I

RG Limited has estimated that number of operating cycle in year 2025-26 will be 3.

The amount of working capital required after taking an estimated 5% unforeseen contingency is Rs. 1,01,850. Other information is as under:

Opening stock of Finished goods is Rs. 31,100 and the closing stock will be lesser by Rs. 4,200 from the opening stock.

Opening stock of Raw Material is Rs. 24,450 and Closing stock of Raw material will be Rs. 28,200. Opening stock of Work in Progress is Rs. 20,500 and Closing stock of Work in Progress will be more by Rs. 1,800 from the Opening stock.

Wages and Manufacturing expenses during the year will be Rs. 1,12,800.

Selling and Distribution expenses during the year will be Rs. 30,000.

Average Creditors for the year is Rs. 26,170.

All Purchases will be done on credit basis only.

Assume a 360 days year.

Using above information, you are required to answer the following questions 1 to 5:

1. What will be the Total Operating Expenses and Cost of Goods Sold for the year?
 - (A) Rs. 2,61,000 and Rs. 2,91,000
 - (B) Rs. 2,91,000 and Rs. 2,61,000
 - (C) Rs. 2,75,500 and Rs. 2,61,000
 - (D) Rs. 2,58,500 and Rs. 2,88,000
2. What will be the Cost of Production and Finished Goods storage period?
 - (A) Rs. 2,58,600 and 45 Days
 - (B) Rs. 2,58,600 and 40 Days
 - (C) Rs. 2,56,800 and 45 Days
 - (D) Rs. 2,56,800 and 40 Days
3. What will be the Raw Material Consumed and Credit purchases?
 - (A) Rs. 1,52,500 and Rs. 1,50,550
 - (B) Rs. 1,49,500 and Rs. 1,52,500
 - (C) Rs. 1,45,800 and Rs. 1,49,550
 - (D) Rs. 1,52,000 and Rs. 1,45,800
4. What will be the Raw material storage period and Work in Progress conversion period?

(A) 62 Days and 32 Days	(B) 65 Days and 30 Days
(C) 63 Days and 33 Days	(D) 63 Days and 45 Days
5. What will be the Creditors Payment period and Debtors Collection period?

(A) 60 Days and 50 Days	(B) 63 Days and 48 Days
(C) 62 Days and 45 Days	(D) 65 Days and 47 Days
6. PRAX Ltd. is an all-equity financed company, currently valued at Rs. 2,100 lakhs, with a cost of capital of 18%. The company is contemplating a strategic financial restructuring by:
 - (i) Repurchasing Rs. 325 lakhs of equity shares.
 - (ii) Replacing the repurchased equity with 16% debentures.

The Company maintains constant Earnings Before Interest and Taxes (EBIT) and following a policy of distributing entire earnings as dividend.

Corporate tax rate is 35%.

What would be the market value of Equity after structure modification as per Modigliani and Miller (MM) Approach?

(A) Rs. 1,888.75 Lakh	(B) Rs. 2,213.75 Lakh
(C) Rs. 1,456.75 Lakh	(D) Rs. 2,538.75 Lakh
7. KL Limited is replacing an existing machine. The replacement cost of the machine is Rs. 1,00,000 now and it requires maintenance of Rs. 20,000 at the end of every year for five

years. At the end of Fifth year, it would have a salvage value of 10,000. The cost of capital is 14%.

PVIFA_{0.14,5} is 3.433 and PVIF_{0.14,5} is 0.519.

What will be the Equivalent Annual Cost (EAC) for the machine?

(A) Rs. 57,617	(B) Rs. 45,217
(C) Rs. 47,617	(D) Rs. 60,217

8. ABC Limited gives you the following information as on 31st March, 2025:

Current Liability : Rs. 1,60,000

Current ratio : 2.5

Liquid ratio (Quick ratio): 2

What will be the value of Stock?

(A) Rs. 80,000	(B) Rs. 1,20,000
(C) Rs. 1,60,000	(D) Rs. 64,000

Case Scenario - II

Solar Tech Innovation, a start-up specialization in next-generation solar panels entered the highly competitive renewable energy sector with a mission to make solar power more accessible and efficient. However, the company faced significant challenges, including high R&D costs, limited consumer awareness, regulatory compliance hurdles and stiff competition from established energy providers. To navigate these challenges, Solar Tech conducted an in-depth market analysis, identifying a strong demand for residential and commercial solar solution due to rising electricity cost and government incentives on green energy. However, it also noted threats from lower-cost alternatives and slow adoption in some regions.

To differentiate itself, Solar Tech developed ultra-thin, high efficiency solar panels that could generate more power in less space. This innovation appealed to homeowners and businesses looking for cost-effective grand space-saving solutions. The company also adopted a strategic expansion model, first targeting urban centers with high energy consumption and gradually moving to rural areas. Internally, the leadership headed by CEO Mr. Rajiv, implemented structural changes to improve decision making. The company embraced a decentralized approach enabling regional teams adapt their sales and marketing strategies to local market conditions. Additionally, Solar Tech partnered with financial institutions to offer easy financing options, making solar energy more affordable.

To enhance operational efficiency, Solar Tech streamlined its supply chain and secured bulk raw material procurement deals, reducing cost without compromising quality. Simultaneously, the company focused on customer education through digital marketing and community outreach programs, increasing awareness and adoption. Over four years, these strategic initiatives led to Solar Tech's expansion across multiple states, partnerships with real estate developers, and a 60% increase in annual revenue. By aligning technological innovation, operational efficiency and market expansion, the company successfully positioned itself in the renewable energy sector.

Based on the above case scenario, choose the correct answer to Q. Nos. 9 to 13.

9. A company's core values are essential for decision making and strategic alignment. Which of the following would be considered a violation of Solar Tech Innovation's values?
- (A) Investing in high-efficiency solar panels that reduce carbon emissions.

- (B) Partnering with fossil fuel companies to increase short term profitability.
 (C) Launching an initiative to make solar energy more affordable for rural areas.
 (D) Encouraging employees to participate in sustainability programs.
10. Solar Tech expands its distribution network by forming partnerships with retail chains. This directly affects which value chain activity?
 (A) Firms infrastructure (B) Inbound logistics
 (C) Outbound logistics (D) Technology development
11. Solar Tech innovation partnered with financial institutions to offer easy financing options to make solar energy more affordable.
 This decision falls under which strategic level?
 (A) Corporate Level (B) Business Level
 (C) Functional Level (D) Operational Level
12. Solar Tech is considering expanding into a developing country where electricity access is low. Which external factor is the primary reason for this decision?
 (A) Low production costs in the target country
 (B) Strong competition from global solar brands
 (C) Availability of skilled solar engineers
 (D) High demand for alternative energy sources
13. A leading real estate developer, Green Habitat Constructions, wants to integrate Solar Tech's next-generation panels into its residential and commercial projects.
 Where would Green Habitat Constructions fall in Mendelow Matrix?
 (A) High power, High interest (Key Players)
 (B) Low power, Low interest (Low Priority)
 (C) Low power, High interest (Keep informed)
 (D) High power, Low interest (Keep Satisfied)
14. Bio Cure is pioneer in low-cost rapid diagnostic kits and commands strong brand loyalty in Tier-2 and Tier-3 Indian cities. The company holds a leading competitive position, thanks to its proprietary technology and wide distribution network. However, the rapid diagnostic industry is maturing, with new regulations, consolidation, and slowing growth rates. Many firms are shifting their focus to AI-powered health platforms, making it harder for traditional players to innovate without high R&D spend.
 Based on the ADL matrix, where is Bio Cure positioned?
 (A) Dominant position in a declining industry
 (B) Strong position in a mature industry
 (C) Tenable position in a growing industry
 (D) Weak position in an ageing industry
15. Edu Edge Learning a digital education start-up, struggled with inconsistent communication and poor integration across departments. Although the strategy and talent were in place, collaboration was ineffective. In order to resolve this issue, the leadership launched a centralized knowledge-sharing platform and defined clear internal communication protocols. Performance appraisal systems were linked to teamwork and collaboration goals, ensuring alignment of all the processes with strategic intent.
 Which aspects of the McKinsey 7-S Framework is being strengthened at Edu Edge?

- (A) Strategy (B) Structure
(C) System (D) Skills
16. In General Electric Matrix, what strategy is recommended for business units with high market attractiveness and strong business strength?
- (A) Invest/Expand (B) Select/Earn
(C) Harvest/Divest (D) Liquidate

SOLUTION :

MCQ No.	Correct Option	MCQ No.	Correct Option	MCQ No.	Correct Option	MCQ No.	Correct Option
1	B	5	B	9	B	13	A
2	D	6	A	10	C	14	B
3	C	7	C	11	C	15	C
4	B	8	A	12	D	16	A

QUESTION 9 : RTP - JAN 2026

PPW Ltd is a mid-sized manufacturing company producing household appliances for the Indian market. With competition heating up, the company's management is becoming increasingly conscious about liquidity management and efficient use of working capital.

During the last financial year, the company recorded annual sales of Rs. 48,00,000, offering its customers a 3-month credit period to encourage bulk orders. While this has boosted sales, it has also tied up significant funds in debtors.

On the production side, the company incurs the following annual costs:

- **Materials consumed:** Rs. 12,00,000 (suppliers allow 2 months' credit)
- **Wages:** Rs. 9,60,000 (paid with a 1-month lag)
- **Cash manufacturing expenses:** Rs. 12,00,000 (settled 1 month in arrears)
- **Administrative expenses:** Rs. 3,60,000 (paid with a 1-month lag)
- **Sales promotion expenses:** Rs. 1,20,000 (paid monthly in advance to agencies)

The company sells its products at a gross profit margin of 20%. It also maintains 2 months' stock of raw materials and 2 months' stock of finished goods to ensure smooth production and timely delivery to distributors.

Further, depreciation is considered part of the cost of production, but since it does not require a cash outflow, management wants to ignore it while assessing the cash cost basis of working capital. A minimum cash balance of Rs. 1,00,000 is always retained for contingencies.

Now, the Board of Directors has asked the finance team to answer the following 5 questions:

- (i) What will be the gross working capital of the company on cash cost basis?
- (A) Rs. 16,00,000 (B) Rs. 17,20,000
(C) Rs. 18,30,000 (D) Rs. 19,60,000
- (ii) PPW Ltd wants to compute its working capital requirement on a cash cost basis (ignoring WIP), assuming a 15% margin. Based on the given financial data, what will be the working capital requirement?
- (A) Rs. 16,33,000 (B) Rs. 10,20,000

- (C) Rs. 20,40,000 (D) Rs. 9,60,000
- (iii) Excluding the 15% margin, what is the Current Ratio of PPW Ltd?
 (A) 4.46 : 1 (B) 3.8 : 1
 (C) 2.0 : 1 (D) 2.2 : 1
- (iv) What is the Quick Ratio of PPW Ltd (excluding the 15% margin)?
 (A) 2.92 : 1 (B) 1.05 : 1
 (C) 2.59 : 1 (D) 1.85 : 1
- (v) What is the Working Capital Turnover Ratio based on cash cost of sales?
 (A) 4 times (B) 3.38 times
 (C) 6.2 times (D) 2.7 times

SOLUTION :**(i) (C) Rs.18,30,000****(ii) (A) Rs.16,33,000****Working Notes:**

(i)	Computation of Annual Cash Cost of Production	(Rs.)
	Material consumed	12,00,000
	Wages	9,60,000
	Manufacturing expenses	12,00,000
	Total cash cost of production	33,60,000
(ii)	Computation of Annual Cash Cost of Sales:	(Rs.)
	Total Cash cost of production as in (i) above	33,60,000
	Administrative Expenses	3,60,000
	Sales promotion expenses	1,20,000
	Total cash cost of sales	38,40,000
	Add: Gross Profit @ 20% on sales (25% on cost of sales)	9,60,000
	Sales Value	48,00,000

Statement of Working Capital requirements (cash cost basis)

	(Rs.)	(Rs.)
A. Current Assets		
Inventory:		
- Raw materials $\left(\frac{\text{Rs.12,00,000}}{12 \text{ months}} \times 2 \text{ months} \right)$	2,00,000	
- Finished Goods $\left(\frac{\text{Rs.33,60,000}}{12 \text{ months}} \times 2 \text{ months} \right)$	5,60,000	
Receivables (Debtors) $\left(\frac{\text{Rs.38,40,000}}{12 \text{ months}} \times 3 \text{ months} \right)$	9,60,000	
Sales Promotion expenses paid in advance $\left(\frac{\text{Rs.1,20,000}}{12 \text{ months}} \times 1 \text{ month} \right)$	10,000	

Cash balance	1,00,000	18,30,000
Gross Working Capital		18,30,000
B. Current Liabilities:		
Payables:		
- Creditors for materials $\left(\frac{\text{Rs.12,00,000}}{12 \text{ months}} \times 2 \text{ months} \right)$	2,00,000	
Wages outstanding $\left(\frac{\text{Rs.9,60,000}}{12 \text{ months}} \times 1 \text{ month} \right)$	80,000	
Manufacturing expenses outstanding $\left(\frac{\text{Rs.12,00,000}}{12 \text{ months}} \times 1 \text{ month} \right)$	1,00,000	
Administrative expenses outstanding $\left(\frac{\text{Rs.3,60,000}}{12 \text{ months}} \times 1 \text{ month} \right)$	30,000	4,10,000
Net working capital (A - B)		14,20,000
Add: Safety margin @ 15%		2,13,000
Total Working Capital requirements		16,33,000

(iii) (A) 4.46 : 1

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ &= \frac{18,30,000}{4,10,000} = 4.46 \end{aligned}$$

(iv) (C) 2.59 : 1

$$\begin{aligned} \text{Quick Ratio or Acid Test Ratio} &= \frac{\text{Quick Assets}}{\text{Current Liabilities}} \\ \text{Quick Assets} &= \text{Current Assets} - \text{Inventories} - \text{Prepaid expenses} \\ \text{Quick Ratio} &= \frac{9,60,000 + 1,00,000}{4,10,000} \\ \text{Or,} &= \frac{18,30,000 - 2,00,000 - 5,60,000 - 10,000}{4,10,000} \\ &= 2.59 \end{aligned}$$

(v) (D) 2.7 times

$$\begin{aligned} \text{Working Capital Turnover Ratio} &= \frac{\text{Sales / Cost of Goods Sold}}{\text{Working Capital excluding Margin}} \\ &= \frac{38,40,000}{14,20,000} \\ &= 2.70 \end{aligned}$$

QUESTION 9 : PAPER - JAN 2026**Case Scenario - I**

AB Infra Projects Limited operates in the construction and infrastructure sector, executing large-scale public and private projects. The company has shown consistent profitability and strong project execution capabilities, which is supported by a balanced mix of equity and long-term debt financing. With several new infrastructure projects under consideration, the management now wants to review the cost of capital to ensure that the company's financing decisions are efficient and aligned with the company's strategic growth objectives. The finance department is evaluating the cost of equity, cost of preference shares and cost of debentures to determine the company's overall Weighted Average Cost of Capital (WACC) and maintain financial stability. The capital structure of AB Infra Projects Limited is as follows:

Particulars	Amount (Rs.)
Equity Shares (face value 10 per share)	60,00,000
12% Preference Share Capital	20,00,000
10% Convertible Debentures	40,00,000
Total Capital of the Company	1,20,00,000

The following are some of the additional information provided by the company relating to the above-mentioned capital structure:

- (i) The risk-free rate of return (R_f) is 6%, equity beta (β) is 1.25 and equity risk premium (R_p) is 8%.
- (ii) The face value of 12% preference shares is Rs. 100 each. These shares are irredeemable, having a flotation cost of 4%. The current market price of preference share is Rs. 100 per share.
- (iii) 10% convertible debentures of Rs. 100 each are issued with a maturity period of 5 Years. At maturity, the debenture holders will have an option to convert the debenture into equity shares of the company in the ratio of 1: 4 (4 shares for each debenture). The current market price of the equity share is Rs. 120 each and company expects share prices to grow at an average rate of 5% per annum in the future. The current market price per debenture is Rs. 150.
- (iv) The rate of corporate income tax is 30%.

Based on the above information, you are required to answer the following questions 1 to 5:

1. What is the cost of equity share capital using Capital Asset Pricing Model (CAPM) Approach and cost of irredeemable preference share capital?

(A) 14.5% and 13%	(B) 15% and 11.5%
(C) 16% and 12.5%	(D) 17.5% and 12%
2. What is the Redemption Value (RV) of debenture?

(A) Rs. 612.62	(B) Rs. 650.60
(C) Rs. 480.00	(D) Rs. 515.50
3. What is the cost of the convertible debentures using approximation method?

(A) 29.33%	(B) 30.74%
(C) 32.50%	(D) 28.25%
4. What is the weighted average cost of capital using market value weights?

(A) 16.05%	(B) 18.55%

- (C) 19.20% (D) 17.02%
5. If the capital structure remains unchanged, determine the market price per equity share (MPS) when the net profit available to equity shareholders (after tax) is Rs. 48,00,000 and the company's P/E ratio is 21.
(A) Rs. 168 (B) Rs. 175
(C) Rs. 150 (D) Rs. 180
6. Mr. X, a senior executive of BPC Electronics Limited has holding of 42,000 shares of the company. The shares are currently trading in the stock exchange at Rs. 480 per share. Mr. X has a policy of reinvesting the amount of any dividends received back into the shares of the company. BPC Electronics Limited has declared and paid a dividend of Rs. 30 per share. What is the total number of shares that Mr. X would hold after he reinvests the dividend received in shares of BPC Electronics Limited?
(A) 45,500 shares (B) 44,800 shares
(C) 45,000 shares (D) 44,625 shares
7. A firm maintains a separate account for cash disbursement. The administrative and transaction cost of transferring cash to the disbursement account is Rs. 25 per transfer. Marketable securities yield 10% per annum. The firm has determined its optimum cash balance at Rs. 30,000, according to the William J. Baumol Model. What will be the Total Annual Cash Disbursements of the firm?
(A) Rs. 18,00,000 (B) Rs. 45,00,000
(C) Rs. 36,00,000 (D) Rs. 27,00,000
8. ZED Ltd. is expecting to pay a dividend of Rs. 50 per share in the next financial year 2025-26. The company's speed of adjustment is 25%, the target pay-out ratio is 40%, and the earnings per share (EPS) for the year amount to Rs. 200. What was the dividend paid for the financial year 2024-25 using Lintner's Model?
(A) Rs. 30 per share (B) Rs. 40 per share
(C) Rs. 60 per share (D) Rs. 50 per share

Case Scenario - II

Kalpanjali Dairy, a mid-sized cooperative based in Uttar Pradesh, has established a reputation over the past 20 years for producing traditional but high-quality dairy products sourced from small-scale farmers. Its operations are rooted in cooperative ethics, aiming for both profitability and farmer welfare.

Now, Kalpanjali is facing multiple cross-challenges rising competition, shifting health narratives, concern for climate change, and ethical debates around animal welfare. With a vision to become a national brand by 2035, Kalpanjali must rethink its plan of action.

The founders of Kalpanjali Dairy intended to create a values-driven brand that not only delivered quality but also empowered dairy farmers. It intends to become one of the top 10 dairy brands in India by 2035, with a strong presence in organic and health-based dairy offerings and providing good services, which is in a heavy demand and has to draw a vision plan accordingly.

A Value Chain Analysis revealed strength in material handling, stock control and better transportation system, but a gap in R&D and digital marketing.

After extensive stakeholder discussion, Kalpanjali considered three strategic options:

1. Defensive Strategy Double down on traditional dairy and educate consumers on the nutritional value of milk and the ethical treatment of animals.
2. Diversification Strategy - Launch a vegan product line (e.g., almond/oat-based milk, vegan yogurt) under a sub-brand to appeal to changing preferences.
3. Collaborative Strategy - Partner with NGOs and health influencers to improve public image and trust.

On detailed internal analysis of various strategic drivers, leadership opted for a hybrid strategy:

- Continue improving and promoting high-quality dairy products with transparent animal welfare practices.
- Simultaneously launch a vegan line to cater to health-conscious and ethically driven consumers under a new sub-brand Kalpanjali Plant Wise.
- Investing in an R&D facility to develop almond milk, oat milk, and vegan ghee.
- Partnering with food tech startups and nutritionists.
- Training farmers to improve animal healthcare and promote "cruelty-free dairy" certification.
- A strong communication campaign: "Empowered by your choice, grounded in respect" - highlighting that Kalpanjali supports both dairy and plant-based lifestyles.
- Rebranding efforts to clearly differentiate the dairy and vegan lines while maintaining core brand identity.

Based on the above case scenario, choose the correct answer to Question No. 9 to 13.

9. Kalpanjali Dairy's action plan to become a top 10 dairy brand by 2035, with a strong presence in organic and health-based dairy offerings, is an example of:

(A) Strategic control	(B) Strategic intent
(C) Operational efficiency	(D) Tactical planning
10. Within the context of Kalpanjali Dairy's analysis, which of the following would be best classified as strength?

(A) Operations	(B) Service
(C) Inbound logistics	(D) Sales
11. Kalpanjali Dairy has decided to launch a new product line featuring vegan yogurt and organic milk in response to shifting consumer preferences. This initiative represents which type of strategic option?

(A) Market Penetration	(B) Concentric Diversification
(C) Conglomerate Diversification	(D) Innovation
12. There is external pressure on the company's traditional dairy business. Which type of strategic challenge is the company facing?

(A) Supply chain inefficiency
(B) Industry deregulation
(C) Socio-cultural shift impacting demand
(D) Technological disruption
13. What strategic driver did company adopt for a long term strategy?

(A) Product	(B) Industry
(C) Pricing	(D) Channel

14. Herbal Care Pvt. Ltd., a reputed Ayurveda brand, had strong domestic sales but struggled to expand internationally due to unclear long-term direction. After reviewing its declining exports, the company introduced a strategic plan focused on global positioning, R&D investment, and sustainable packaging. The process unified departmental efforts, improved brand consistency, and attracted foreign partners. Within a short span, Herbal Care's exports rose significantly. This case highlights which key importance of strategic management?
- (A) It enhances daily operational control.
 (B) It provides clear direction and long-term organizational focus to move ahead.
 (C) It focuses mainly on employee enhancement and growth.
 (D) It ensures faster product manufacturing.
15. Urban Stay Realty decided to expand into Tier-2 cities after strategic planning. The firm allocated budgets, assigned projects to motivated teams, collaborated with local banks for financing, set up monitoring systems for construction and marketing activities, and develop conducive culture. Within two years, the company launched new housing projects successfully and captured market share in new regions. Which stage of strategic management does this case describe?
- (A) Environmental Scanning (B) Strategy Formulation
 (C) Strategy Implementation (D) Evaluation and Control
16. A café is overcrowded on weekends but nearly empty on weekdays. To even out demand, it launches a "Workday Loyalty Card" with discounts for weekday visits. This strategy illustrates:
- (A) Demarketing (B) Augmented Marketing
 (C) Social Marketing (D) Synchro-marketing

SOLUTION :

MCQ No.	Correct Option	MCQ No.	Correct Option	MCQ No.	Correct Option	MCQ No.	Correct Option
1	(C)	5	(A)	9	(B)	13	(A)
2	(A)	6	(D)	10	(C)	14	(B)
3	(B)	7	(A)	11	(B)	15	(C)
4	(D)	8	(B)	12	(C)	16	(D)

QUESTION 10 : RTP - MAY 2026

ABC Ltd, a newly incorporated company, commenced its operations in 2024 by issuing equity shares at face value. The company follows a pure equity capital structure and has 10,000 equity shares outstanding.

During its first two years of operations, the company demonstrated stable financial performance. It earned a profit of Rs. 1,00,000 in 2024 and Rs. 1,04,000 in 2025, reflecting a consistent annual growth rate of 4%. The company's cost of equity (K_e) is estimated at 8%. Based on the Gordon Growth Model, the market price per share at the end of 2025 has been valued at Rs. 162.24.

Although the company has been following a traditional dividend payout policy, the management is now concerned about whether this policy maximizes shareholders' wealth. Specifically, the Board of Directors wants to assess whether the current dividend payout ratio is appropriate in light of the company's growth prospects and return on retained earnings.

To support this decision, the finance team has been instructed to evaluate the firm's dividend policy using both the Gordon Growth Model and Walter's Model. The objective is to determine the impact of the existing and alternative dividend payout strategies on the company's market price per share, growth rate, capital employed, and overall shareholder wealth maximization.

You are required to answer the following requirements:

- (i) Based on the given information, what is the face value per share and the rate of return on retained earnings (r)?

(A) Rs. 10 and 8%	(B) Rs. 100 and 10%
(C) Rs. 100 and 8%	(D) Rs. 10 and 10%
- (ii) What is the market price per share in 2025 under Walter's Model?

(A) Rs. 162.24	(B) Rs. 150.00
(C) Rs. 143.00	(D) Rs. 170.00
- (iii) If the firm's return on retained earnings (10%) is greater than its cost of equity (8%), what is the optimum dividend payout ratio and corresponding market price per share?

(A) 60% payout; Rs. 143.00	(B) 40% payout; Rs. 150.00
(C) 0% payout; Rs. 162.50	(D) 100% payout; Rs. 130.00
- (iv) What is the capital employed at the beginning of 2026, growth rate and estimated earnings for 2026 if company continue the existing (traditional) dividend payout ratio in 2025?

(A) Rs. 11,24,864; 4%; Rs. 1,12,486	(B) Rs. 11,89,760; 10%; Rs. 1,18,976
(C) Rs. 10,81,600; 4%; Rs. 1,08,160	(D) Rs. 11,24,864; 10%; Rs. 1,18,976
- (v) What is the capital employed at the beginning of 2026, growth rate and estimated earnings for 2026 if company adopts optimum dividend payout ratio in 2025?

(A) Rs. 11,24,864; 4%; Rs. 1,12,486	(B) Rs. 11,89,760; 10%; Rs. 1,18,976
(C) Rs. 10,40,000; 8%; Rs. 1,04,000	(D) Rs. 11,44,000, 10%, Rs. 1,14,400

SOLUTION :

- (i) **(B) Rs. 100 and 10%**

Working Note 1: Earnings per Share (EPS) and Growth rate

$$\text{EPS}_{2025} = \frac{1,04,000}{10,000} = \text{Rs. } 10.40$$

$$\text{Growth rate (g)} = \frac{1,04,000 - 1,00,000}{1,00,000} = 4\%$$

Working Note 2: Dividend Payout Ratio & Retention Ratio

Using Gordon Growth Model:

$$P_0 = \frac{D_1}{K_e - g}$$

$$162.24 = \frac{D_1}{0.08 - 0.04} \Rightarrow D_1 = 6.4896$$

$$D_0 = \frac{6.4896}{1.04} = \text{Rs. } 6.24$$

Dividend Payout Ratio (DPR)

$$\text{DPR} = \frac{6.24}{10.40} = 60\%$$

Retention Ratio (b)

$$b = 1 - 0.60 = 40\%$$

Working Note 3: Rate of Return on Retained Earnings (r)

$$g = b \times r$$

$$0.04 = 0.40 \times r \Rightarrow r = 10\%$$

$$\text{Earnings in 2024} = 1,00,000$$

$$\text{Capital employed} = \frac{1,00,000}{10\%} = \text{Rs. } 10,00,000$$

$$\text{Face value per share} = \frac{10,00,000}{10,000} = \text{Rs. } 100$$

(ii) (C) Rs. 143.00

Market Price per Share under Walter's Model (2025)

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where:

$$E = 10.40$$

$$D = 6.24$$

$$r = 10\%$$

$$K_e = 8\%$$

$$\frac{r}{K_e} = 1.25$$

$$E - D = 4.16$$

$$P = \frac{6.24 + (1.25 \times 4.16)}{0.08}$$

$$P = \text{Rs. } 143.00$$

(iii) (C) 0% payout; Rs. 162.50

Optimum Dividend Policy and Optimum Price (Walter's Model)

When $r > K_e$, optimum dividend payout ratio = 0%

$$D = 0$$

$$P = \frac{\frac{r}{K_e} \times E}{K_e}$$

$$P = \frac{1.25 \times 10.40}{0.08} = \text{Rs. } 162.50$$

(iv) (C) **Rs. 10,81,600; 4%; Rs. 1,08,160**

Year	Capital Employed in Beginning (Rs.)	Retained Earning for the year (Rs.)
2024	Rs. 10,00,000	1,00,000 x 40% = Rs. 40,000
2025	10,00,000 + 40,000 = Rs. 10,40,000	1,04,000 x 40% = Rs. 41,600
2026	10,40,000 + 41,600 = Rs. 10,81,600	-

Earnings 2026 = 10,81,600 x 10% = Rs. 1,08,160

Growth rate = 4%

(v) (D) **Rs. 11,44,000, 10%, Rs. 1,14,400**

Revised Growth rate under optimum dividend policy

$$G = b \times r$$

$$G = 100 \times 10\% \Rightarrow g = 10\%$$

Capital employed (Beginning 2026) = 10,40,000 + (1,04,00 x 100%) = Rs. 11,44,000

Earnings 2026 = 11,44,000 x 10% = Rs. 1,14,400

QUESTION 11 : PAPER - MAY 2026

Case Scenario - I

XYZ Ltd. is engaged in manufacturing of an electronic component, to be used by industries producing electronic gadgets for domestic use. The company is a leveraged company, currently paying annual interest of Rs. 33 lakhs on its 11% debt. The company is financially prudent. It has a balance of Rs. 50 lakhs as retained earnings. The company maintains Long-term Debt to Equity ratio of 2: 1. The face value per share of the company is Rs. 10.

Due to operating in a competitive market, the marketing manager of the company has submitted a report exhibiting significant potential for sales growth. The production manager has endorsed the idea and has suggested adopting latest technology at the workplace. In case the company implements new technology, the production efficiency will increase which will bring down the overall cost of production. To procure and install this new technology, the company requires an additional fund of Rs. 3 crores. This additional fund will be arranged in such a manner that it will not impact the present Long-term Debt to Equity ratio. The additional debt will carry interest rate of 12% p.a. As a result of implementing the new technology, it is anticipated that ROI will increase by 3% from present ROI of 15%. Applicable tax rate is 30%.

Based on the facts mentioned above pertaining to XYZ Ltd., you are required to answer the following questions 1 to 5:

- What is the equity share capital outstanding before the additional fund is introduced?
 - Rs. 1.00 crores
 - Rs. 1.50 crores
 - Rs. 0.50 crores
 - Rs. 2.00 crores
- What is the total capital employed before and after additional financing?
 - Rs. 4.00 crores and Rs.7.00 crores
 - Rs. 5.00 crores and Rs.8.00 crores
 - Rs. 4.50 crores and Rs. 7.50 crores
 - Rs. 5.50 crores and Rs. 8.50 crores

3. Compute the EPS after additional financing. What will be the percentage increase in EPS of the company, after introducing the additional fund?
 (A) Rs. 2.73, 13.04% (B) Rs. 2.18, 35.65%
 (C) Rs. 2.73, 11.54% (D) Rs. 2.18, 26.28%
4. What will be the expected MPS after the change in funds, if company expects a P/E ratio of 20?
 (A) Rs. 43.68 (B) Rs. 54.60
 (C) Rs. 70.00 (D) Rs. 47.60
5. What will be the post-tax weighted average cost of debt after additional financing?
 (A) 7.70% (B) 8.05%
 (C) 9.00% (D) 7.98%
6. A company has credit sales of Rs. 20,00,000 with an average collection period of 35 days. It wants to liberalize its existing credit terms which are expected to increase sales to Rs. 25,00,000. However, average collection period is expected to decline to 10 days. Profit Volume ratio is 20% and opportunity cost (post-tax) is 6%. Tax rate is 40%. Assume 360 days in a year.

What is the incremental investment in debtors and its impact on post-tax profitability?

	Incremental Investment in debtors	Impact on Post -tax profitability
(A)	Rs. (1,25,000)	Rs. 7,500
(B)	Rs. (1,00,000)	Rs. (6,000)
(C)	Rs. (1,25,000)	Rs. (7,500)
(D)	Rs. (1,00,000)	Rs. 6,000

7. FG Ltd. is appraising a one-year investment plan, which requires an initial outlay of Rs.1,00,000. At the end of term, it will be matured at Rs. 1,25,000. The plan has a beta of 1.3, risk free rate of return 10% and market rate of return 18%. Calculate the required rate of return and decide whether the plan is worthwhile.
 (A) 25%, The plan is not worthwhile.
 (B) 20.4%, The plan is not worthwhile.
 (C) 20.4%, The plan is worthwhile.
 (D) 25%, The plan is worthwhile.
8. Details of a project are given below:

Initial outlay	Rs. 800 lakhs
NPV at 16% discount rate	Rs. 50.71 lakhs
NPV at 20% discount rate	Rs. (26.84) lakhs

What will be Internal rate of return (IRR) of the project? If cost of capital is 18.50%, should the project be accepted?

- (A) 16.00%, Yes (B) 18.62%, Yes
 (C) 18.00%, Yes (D) 18.62%, No

Case Scenario - II

Alex Motor Company was born out of crisis in a small garage on the edge of a dusty town. In the early 90s when the fuel prices soared and imported vehicles flooded the market, many

automobile companies were forced to shut down their operations. Many employees lost their jobs.

Ajay Sharma, a production engineer at a failing automobile plant along with ten of his colleagues, rented an abandoned garage and a portion of unused equipment from a shutdown factory and decided to start operations. Their main aim was to transform Indian auto industry by providing comprehensive, affordable and fuel-efficient vehicles. Instead of chasing volumes, the company focused on customization-adjustable cargo layouts, fuel efficient engines and easy maintenance to cater demand of narrow market.

Alex Motor Company developed its first commercial model Alex One which was simple but could survive floods, heat waves, bumpy roads, and most importantly was fuel efficient. The customers loved it and hence sales grew steadily.

Ajay made a simple promise that every decision would begin on the factory floor and not in the board-room. Mechanics were encouraged to suggest improvement in design and were rewarded for the best innovations, but success brought a new challenge.

The younger generation demanded technology with higher connectivity, better safety systems and cleaner energy. Due to these matters Alex Motor Company lagged behind from the flashy foreign brands that entered the Indian market.

As a result, sales declined and critics called the company outdated. Ajay, now the CEO of the company, faced defining choice, either to sell the company or reinvent it.

Ajay's team of engineers, through participation, shared their next plan of action to the employees for the further technology upgradation, in order to gain growth and success of business. The team took the initiative to develop the good working culture and code of ethics. They focused on training and various motivational plans for employees so they can be tuned up with new working system. In this way the company made its breakthrough with the launch of Alex Electra; a hybrid vehicle designed specifically for congested urban environment. It was not just the technology that made Electra different, but the mindset. Engineers, designers and data-analysts worked side by side, decision making became faster and mistakes were treated as learning cost and not failures.

Alex Motor Company also established company-owned showrooms and service centers to increase their sales and provide free after-sale services which led to improved customer services and brand image.

Today Alex Motor Company's success is studied in business schools as it proved that companies that listen, learn and adapt can outlast any crisis.

Based on the above case scenario, choose the correct answer to questions no. 9 to13:

9. Identify the initial strategy to gain competitive advantage adopted by Alex Motor Company.
 - (A) Growth strategy emphasizing strong and fuel-efficient vehicles.
 - (B) Focused cost leadership strategy emphasizing fuel efficiency and easy maintenance.
 - (C) Focused differentiation strategy emphasizing customized commercial vehicles, easy maintenance and fuel efficiency rather than mass production.
 - (D) Expansion strategy emphasizing customized vehicles and mass production.
10. Use McKinsey's 7S Model to identify the soft elements that change during reinvention.
 - (i) Shared value
 - (ii) Style

- (iii) Strategy (iv) Staff
- (A) Only (i) and (ii) are correct.
- (B) Only (i), (iii) and (iv) are correct.
- (C) (i), (ii), (iii) and (iv) are correct.
- (D) Only (i), (ii) and (iv) are correct.
11. Strategic Management allowed Alex Motor Company to be
- (A) More directive towards the cross-functional team to reduce communication barrier.
- (B) Partly proactive as the company anticipated future urban mobility needs and partly reactive as the company responded to the declining sales.
- (C) More proactive as it readily launched Alex Electra with updated technology to stay competitive.
- (D) More authoritative in taking faster decisions.
12. Ajay Sharma undertook a retrenchment strategy to save his company when the sales of his company declined, and his company was called outdated. The action plan undertaken to implement it was
- (i) Assessing the current problem
- (ii) Providing innovative transport service
- (iii) Developing an action plan with specific goals
- (iv) Restructuring organizational hierarchy
- Which of the above actions does not pertain to the strategy undertaken by Ajay Sharma?
- (A) (ii) and (iv) (B) (iii) and (iv)
- (C) (i), (iii) and (iv) (D) Only (iii)
13. The mission of Alex Motor Company was:
- (A) To adopt new technology such as connectivity, advanced safety features and cleaner energy solutions.
- (B) Introducing cross-functional teams so that decision making process becomes faster.
- (C) To establish company owned showrooms and service centers to increase their sales and provide after sale services.
- (D) To transform Indian auto industry by providing comprehensive, affordable and fuel-efficient vehicles through present capability and activities.
14. Altex Ltd. is a company that produces and sells home appliances. However, at present the company is facing stiff competition from the new entrants who are offering similar products at a lower price. To stay competitive the top management of the company decided to adopt the best cost provider strategy. Which of the following actions should the company take to align with their best cost provider strategy?
- (A) Reducing the price of their products without making changes in manufacturing process and product features.
- (B) Streamlining manufacturing processes to reduce cost, sourcing materials from cost-effective suppliers and adding innovative features to their products.
- (C) Streamlining manufacturing processes to reduce cost with no innovation in product feature.

- (D) Focusing solely on premium features thereby increasing the cost of the products to reflect the added value.
15. A fashion retail company is designing a new marketing campaign for Generation Z. During its market survey, the company observes that customers' personal preferences, attitudes, lifestyle, motivation, and perception of quality strongly influence their buying behaviour, even before they are exposed to advertisements or peer opinions. Considering these facts, the company should primarily focus on which conceptual domain of the consumer behaviour?
- (A) Cultural influences (B) Social influences
(C) External influences (D) Internal influences
16. In General Electric (GE) Nine-Cell Matrix, which two dimensions form the basis of portfolio analysis to develop the strategic options?
- (A) Business Strength and Market Attractiveness
(B) Company's Strength and Weakness
(C) Market Share and Market Growth Rate
(D) Competitive Intensity and Pricing Trends

SOLUTION :

MCQ. No.	Correct Answer	MCQ. No.	Correct Answer	MCQ. No.	Correct Answer	MCQ. No.	Correct Answer
1	(A)	5	(D)	9	(C)	13	(D)
2	(C)	6	(D)	10	(D)	14	(B)
3	(A)	7	(C)	11	(B)	15	(D)
4	(B)	8	(B)	12	(A)	16	(A)

QUESTION 12 : RTP - SEPT 2026

AURO Engineering Pvt. Ltd. is engaged in the manufacturing of industrial machinery and heavy engineering equipment used in infrastructure, automobile, and renewable-energy projects. Over the last few years, the company has achieved stable growth in revenues and profitability due to increasing demand from domestic and export markets. The management is presently evaluating its long-term financing strategy in view of its proposed expansion into high-capacity precision engineering equipment.

The General Manager - Finance of the company CA Jenisha K informed the Board of Directors that the company has been maintaining a balanced capital structure consisting of equity shares, preference shares, and long-term debentures. However, with the proposed expansion plans, the company is considering additional debt financing to take advantage of financial leverage and tax benefits associated with debt capital.

As on 31st March, 2026, the company had the following capital structure at book values:

Particulars	Amount (Rs.)
Equity Share Capital (1,00,00,000 shares)	30,00,00,000

11.5% Preference Shares	6,00,00,000
10% Debentures	10,00,00,000
Total Capital Employed	46,00,00,000

The equity shares of the company are currently quoted at Rs. 300 per share in the stock market. The company expects to pay a dividend of Rs. 15 per equity share next year, and the dividend is expected to grow at a constant rate of 5% per annum indefinitely. The applicable corporate tax rate for the company is 35%.

The management is now considering raising additional debt of Rs. 5,00,00,000 by issuing 12% debentures. The Finance Director expects that the proposed increase in financial leverage may improve shareholders' returns in the short run. As a result of the revised financing plan, the expected dividend per share is estimated to increase to Rs. 20 per share, while the dividend growth rate is expected to remain unchanged at 5% per annum. However, due to increased financial risk arising from higher leverage, the market price of the company's equity shares is expected to decline to Rs. 250 per share.

The Board of Directors has requested the finance team to evaluate the impact of the proposed financing decision on the company's overall cost of capital and advise whether the revised capital structure would be financially beneficial for the company.

You are required to answer the following the questions:

- (i) What will be the Cost of Equity (Ke) under the existing capital structure?
 - (a) 9%
 - (b) 10%
 - (c) 10.25%
 - (d) 11%
- (ii) What will be the existing Weighted Average Cost of Capital (WACC) of the company?
 - (a) 9.12%
 - (b) 9.43%
 - (c) 9.85%
 - (d) 10.20%
- (iii) What will be the revised Cost of Equity (Ke) after raising additional debt?
 - (a) 11%
 - (b) 12%
 - (c) 13%
 - (d) 14%
- (iv) What will be the after-tax cost of the newly issued debentures?
 - (a) 6.80%
 - (b) 7.20%
 - (c) 7.80%
 - (d) 8.40%
- (v) What will be the revised Weighted Average Cost of Capital (WACC) after the proposed debt financing?
 - (a) 10.12%
 - (b) 10.48%
 - (c) 11.04%
 - (d) 11.62%

SOLUTION :

- (i) (b) 10%

Using Dividend Growth Model:

$$K_e = \frac{D_1}{P_0} + g$$

Where:

- $D_1 = \text{Rs. } 15$
- $P_0 = \text{Rs. } 300$
- $g = 5\%$

$$\begin{aligned} K_e &= \frac{15}{300} + 0.05 \\ &= 0.05 + 0.05 \\ &= 10\% \end{aligned}$$

(ii) (b) **9.43%**

Cost of Preference Shares

$$K_p = 11.5/100 = 11.5\%$$

After-tax Cost of Debentures

$$K_d = 10\% (1 - 0.35) = 6.5\%$$

WACC Computation

Source	Amount (Rs.)	Weight (W)	Cost (C)	Weighted Cost (W x C)
Equity Shares	30,00,00,000	0.6522	10%	6.52%
Preference Shares	6,00,00,000	0.1304	11.5%	1.50%
Debentures	10,00,00,000	0.2174	6.5%	1.41%
Total	46,00,00,000	1.0000		9.43%

(iii) (c) **13% Solution:**

Using Dividend Growth Model:

$$\begin{aligned} K_e &= \frac{20}{250} + 0.05 \\ &= 0.08 + 0.05 \\ &= 13\% \end{aligned}$$

(iv) (c) **7.80%**

$$\begin{aligned} K_d &= 12\% (1 - 0.35) \\ &= 7.8\% \end{aligned}$$

(v) (c) **11.04%**

Revised Capital Structure

Particulars	Amount (Rs.)
Equity Share Capital	30,00,00,000
Preference Shares	6,00,00,000
Existing Debentures	10,00,00,000
New Debentures	5,00,00,000
Total Capital	51,00,00,000

Revised WACC Computation

Source	Weight (W)	Cost (C)	Weighted Cost (W x C)
Equity Shares	0.5882	13%	7.65%
Preference Shares	0.1176	11.50%	1.35%
Existing Debentures	0.1961	6.50%	1.27%
New Debentures	0.0981	7.8%	0.77%
Total	1.0000		11.04%

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