A. S. Foundation's
VKNOW
Victory of Knowledge

Vinod Kumar Agarwal's
A. S. Foundation
Assured Success

CA INTER

FM

THEORY, PROBLEMS & SOLUTION

Sample Notes

Curated By:-

CA, CPA Vinod Kumar Agarwal

(AIR 2 - CA Foundation, AIR 4 - CA Inter, AIR 24 - CA Final)

www.vknow.in 9766921860 8788968910

A. S. Foundation's
VKNOW
Victory of Knowledge

ABOUT

CA VINOD KUMAR AGARWAL

(AIR-2nd, 4th & 24th IN FOUNDATION, INTER & FINAL RESPECTIVELY)

SUMMARY

Founder Member of A.S. Foundation, India's Leading Academy for C.A. Course, CA Vinod Kumar Agarwal is a fellow member of ICAI and a past member of the Board of Studies, ICAI. With a teaching experience of twenty years, he has guided more than 1,00,000 students and is ranked as one of the best teachers for Accounts and Financial Management at Intermediate level and Financial Reporting and SFM at Final Level.

He has authored books on Accounts, Advanced Auditing for CA Final, Auditing for Intermediate, Accounting Standards, Ind AS, Costing and Financial Management, and his books have sold more than 2,00,000 copies.

PUBLICATIONS AND ACHIEVEMENTS

- A merit holder in all the three levels of exams conducted by ICAI (2nd rank, 4th rank, and 24th rank in CA Foundation, CA Intermediate an CA Final respectively).
- Scored 99 marks in Accountancy in CA Foundation.
- Authored books on Accounts, Advanced Auditing for CA Final, Auditing for Intermediate, Accounting Standards, Ind AS, Costing and Financial Management.
- Complied a book "No Truth, Only Interpretations", a book on motivation, inspiration and guidance.
- Compiled a book, "Mind Candy", a book on motivation.
- Compiled a book, "Sweet Voice", a book on inspirational quotes.
- Working experience with India's top firms Firms like M/s. S.B. Billimoria and A.F. Ferguson (both member firm of Deloitte).
- Published article in the Students Newsletter of ICAI on "Valuation of Equity Shares" and "Stock Market Index".
- Presented a paper on "Corporate Governance and Role of Auditor" in National Students Conference held in Goa.

EDUCATION

- Passed the Certified Public Accountant (CPA) (USA) exam in 2007.
- Post-graduation from Pune University with First Class.
- Graduation from B.M.C.C, Pune with distinction.
- Passed the Diploma in Business Finance Conducted by ICFAI, Hyderabad.
- Passed the Derivative Module test conducted by National Stock Exchange.
- Also appeared for UPSC exam and cleared Mains twice.

TEACHING EXPERIENCE

- Teaches Accounts, Advanced Accountancy, Financial management and Economics for Finance at CA Intermediate Level and Financial Reporting and Advanced Financial Management (AFM) at CA Final level.
- Pioneer of creating and distributing video tutorials in pen drives/google drive among students.
- Produced All India Toppers (1st Rank) in CPT examination and final examination apart from more than 250 all India merit- holders.
- More than 30000 Facebook subscribers, more than 42000 YouTube subscribers.
- Sold more than 40000 video lectures in pen-drive and google-drive mode.
- In 2019, launched a brand VKNOW, to become a national brand for digital learning.

TEACHING APPROACH

- Simple and effective way of teaching through concept building, class-room practice, home-exercise, and power-point presentation.
- A large variety of problems are solved in the class to meet the examination requirements.
- Notes are updated frequently covering amendments and exam problems.

CHAPTER - 8 Dividend Decisions

8.1 INTRODUCTION

Long term Finance function decisions broadly covers three areas:

(i) Financing decision

(ii) Investment decision

(iii) Dividend decision

- Dividend Decision is easy to understand but difficult to implement.
- Let us understand this with the help of an example, suppose a company, say X limited, which is continuously paying the dividend at a normal growth rate, earns huge profits this year.
- Now the management have to decide whether it should continue to pay dividend at normal rate or to pay at an increasing rate. Why this dilemma?
- The reason is that, if the management decides to pay higher dividend, then it might be possible that next year, the company will not achieve such higher growth rate, resulting in lower dividend payment in comparison to previous year.
- However, if the company decides to stay on the normal rate of dividend, then surplus amount of retained earnings would remain idle which will result in over capitalization, if no other opportunity exist to utilize the idle funds.
- There are few Dividend theories which put light on the complexities involved in dividend decision. These theories have been discussed under the following two categories:
- **Irrelevance Theory:** MM Approach
- **Relevance Theory:** Walter's Model & Gordon's Model

8.2 MEANING OF DIVIDEND

Dividend is that part of Profit After Tax (PAT) which is **distributed to the shareholders** of the company. Further, the profit earned by a company after paying taxes can be used for:

(i) Distribution of dividend, or

(ii) Retaining as surplus for future growth

8.3 FORMS OF DIVIDEND

1. Cash dividend:

- It is the most common form of dividend. Cash here means cash, cheque, warrant, demand draft, pay order or directly through Electronic Clearing Service (ECS) but not in kind.

2. Stock dividend (Bonus Shares):

- It is a distribution of shares in lieu of cash dividend.
- When the company issues new shares to its existing shareholders without any consideration it is called bonus shares.
- Such shares are distributed proportionately thereby retaining proportionate ownership of the company.
- If a shareholder owns 100 shares at a time and 10% dividend is declared, then he will have 10 (100 x 10%) additional shares thereby increasing the equity share capital and reducing reserves and surplus (retained earnings).
- The total net worth is not affected by bonus issue as retained earnings are only capitalised.

CONDITIONS OF STOCK DIVIDEND OR BONUS ISSUE

- To issue Bonus shares, a Company needs to fulfil all the conditions given by Security Exchange Board of India (SEBI).
- As per SEBI, the bonus shares are issued not in lieu of cash dividends.
- A bonus issue should be authorised by Article of Association (AOA) and not to be declared unless all partly paid-up shares have been converted into fully paid-up shares.
- The Company should not have defaulted in re-payment of loan, interest and any statutory dues.
- Bonus shares are to be issued only from share premium and free reserves and not from capital reserve on account of fixed assets revaluation.

ADVANTAGES OF STOCK DIVIDEND

1) TO SHAREHOLDERS:

a) No tax is payable by shareholders on stock dividend received from domestic company as it is not treated as dividend but capital asset under Income Tax Act, 1961.

b) Policy of paying fixed dividend per share and its continuation even after declaration of stock dividend will increase total cash dividend of the shareholders in future.

2) TO COMPANY:

a) Conservation of cash for meeting profitable investment opportunities.

b) Suitable in case of cash deficiency and restrictions imposed by lenders to pay cash dividend.

LIMITATIONS OF STOCK DIVIDEND

Limitations of stock dividend to shareholders and company are as follows:

1. To Shareholders:

- Stock dividend does not affect the wealth of shareholders and therefore it has no value for them.
- This is because the declaration of stock dividend is a method of capitalising the past earnings of the shareholders and is a formal way of recognising earnings which the shareholders already own.
- It merely divides the company's ownership into a large number of share certificates.
- Stock dividend does not give any extra or special benefit to the shareholder.
- His proportionate ownership in the company does not change at all.
- Stock dividend creates a favourable psychological impact on the shareholders and is greeted by them on the ground that it gives an indication of the company's growth.

2. To Company:

- Stock dividends are costlier to administer than cash dividends.
- It is disadvantageous if periodic small stock dividends are declared by the company as earnings.

8.4 SIGNIFICANCE OF DIVIDEND POLICY

Dividend policy of a firm is governed by:

i) Long Term Financing Decision:

- As we know that one of the financing options is 'Equity'. Equity can either be raised externally through issue of new equity shares or can be generated internally through retained earnings. For Equity, retained earnings are preferable because they do not involve any floatation costs (issue expenses).
- But whether to retain or distribute the profits, forms the basis of this decision. Further, payment of cash dividend reduces the amount of funds required to finance profitable investment opportunities thereby restricting its financing options.

  In this backdrop, the decision is based on the following:

  1. Whether the organization has opportunities in hand to invest the profit, if retained?
  2. Whether the return on such investment (ROI) will be higher than the expectations of shareholders i.e. K_e?

ii) Wealth Maximization Decision:

Under this decision, we are facing the problem as to what amount of dividend shall be distributed i.e. the Dividend Payout ratio (D/P) in relation to Market price of the shares (MPS)? This decision is based on the following:

1. Because of market imperfections and uncertainty, shareholders give more importance to near dividends than future dividends and capital gains. Payment of dividends influences the market price of the share directly. Higher dividends increase the value of shares and low dividends decrease it. A proper balance has to be struck between these two approaches.
2. When the firm increases its retained earnings, shareholders' dividends decreases and consequently market price is affected. Use of retained earnings to finance profitable investments increases the future earnings per share. This is because, shareholders expect that profitable investments made by the company may lead to higher return for them in future. On the other hand, increase in dividends may cause the firm to forego investment opportunities for lack of funds and thereby decrease the future earnings per share.

Thus, management should develop a dividend policy which divides net earnings into dividends and retained earnings in an optimum way so as to achieve the objective of wealth maximization for shareholders.

Such a policy will be influenced by investment opportunities available to the firm and value of dividends as against capital gains to shareholders.

8.5 RELATIONSHIP BETWEEN RETAINED EARNINGS AND GROWTH

It can be illustrated with the help of the following equation:

Growth (g) = br

Where,

g = Growth rate of the firm

b = Retention ratio

r = Rate of return on investment

Let us understand this relationship between retained earnings and growth with the help of following example:

EXAMPLE - 1:

- Suppose there are two companies namely A Ltd. & B Ltd. having capital employed of `50,00,000 in terms of Equity shares (`100 each are earning @ 20%. Both have same capital structure and same ROI but different dividend policy.
- A Ltd. distributes 100% of its earnings whereas B Ltd. distributes only 50%.

Now, considering the other things to remain same, the position of both the companies during the next year will be:

A Ltd	(`)	B Ltd	(`)
Previous year		**Previous year**	
Earnings @ 20%	`10,00,000	Earnings @ 20%	` 10,00,000
Dividend	` 10,00,000	Dividend	` 5,00,000
Retained Earnings	Nil	Retained Earnings	` 5,00,000
Current year		**Current year**	
Existing capital	' 50,00,000	Existing capital	` 50,00,000
Existing Retained Earnings	Nil	Existing Retained Earnings	` 5,00,000
Total capital employed	` 50,00,000	Total capital employed	` 55,00,000
Earnings @ 20%	` 10,00,000	Earnings @ 20%	` 11,00,000

Hence with the help of above example, it is easy to understand that how retained earnings lead to growth.

8.6 DETERMINANTS IF DIVIDEND DECISIONS

The dividend policy is affected by the following factors:

1. **Availability of funds:** If the business is in requirement of funds, then retained earnings could be a

good source. The reason being the saving of floatation cost and prevention of dilution of control which happens in case of new issue of equity shares to public.

2. **Cost of capital:** If the financing requirements are to be executed through debt (relatively cheaper source of finance), then it would be preferable to distribute more dividend. On the other hand, if the financing is to be done through fresh issue of equity shares, then it is better to use retained earnings as much as possible.
3. **Capital structure:** An optimum Debt Equity ratio should also be considered for the dividend decision.
4. **Stock price:** Stock price here means market price of the shares. Generally, higher dividends increase market value of shares and low dividends decrease the value.
5. **Investment opportunities in hand:** The dividend decision is also affected if there are investment opportunities in hand. In that situation, the company may prefer to retain more earnings.
6. **Internal rate of return (IRR):** If the internal rate of return (IRR) is more than the cost of retained earnings (Kr), it is better to distribute the earnings as much as possible.
7. **Trend of industry:** The investors depend on some industries for their regular dividend income. Therefore, in such cases, the firms have to pay dividend in order to survive in the market.
8. **Expectation of shareholders:** The shareholders can be categorised into two categories: (i) those who invests for regular income, & (ii) those who invests for growth. Generally, the investor prefers current dividend over the future growth.
9. **Legal constraints:** Section 123 of the Companies Act, 2013 which provides for declaration of dividend sates that Dividend shall be declared or paid by a company for any financial year only:
   a) out of the profits of the company for that year arrived at after providing for depreciation in accordance with the relevant provisions , or
   b) out of the profits of the company for any previous financial year or years
   c) arrived at after providing for depreciation in accordance with the
   d) relevant provisions and remaining undistributed, or
   e) out of both, or
   f) out of money provided by the Central Government or a State Government for the payment of dividend by the company in pursuance of a guarantee given by that Government.

   It may be noted that, while computing the profits for payment of dividends any amount representing unrealised gains, notional gains or revaluation of assets and any change in carrying amount of an asset or of a liability on measurement of the asset or the liability at fair value shall be excluded.
10. **Taxation:** Before 1st April 2020, as per Section 115-O of Income Tax Act, 1961, dividend was subject to dividend distribution tax (DDT) in the hands of the company. Dividend on which DDT was paid, was to be exempted in the hands of the shareholder u/s 10(34). However, as per amendment made by the Finance Act 2020, the exemption u/s 10(34) shall not apply to dividend received on or after 1st April 2020 and the dividend income from shares held as investment shall be taxable under the head of 'Other income' at the applicable slab rate.

8.7 PRACTICAL CONSIDERATIONS IN DIVIDEND POLICY

The formulation of dividend policy depends upon answers to the following questions:

- Whether there should be a stable pattern of dividends over the years? or
- Whether the company should treat each dividend decision completely independent?

The practical considerations in dividend policy of a company are briefly discussed below:

A) **FINANCIAL NEEDS OF A COMPANY:** Retained earnings can be a source of finance for creating profitable investment opportunities. As we discussed earlier, when internal rate of return of a company is greater than return required by shareholders, it would be advantageous for the shareholders to re-invest their earnings.

   Risk and financial obligations increase if a company raises capital through issue of new shares where floatation costs are involved.

   In this respect, a comparison between growth companies and mature companies has been given as follows:

Mature Companies	Growth Companies
(1) Mature companies having few investment opportunities will show high payout ratios;	(1) Growth companies have low payout ratios. They are in need of funds to finance fast growing fixed assets.
(2) Share prices of such companies are sensitive to any changes in dividend payout.	(2) Distribution of earnings reduces the funds of the company. They retain all the earnings and declare bonus shares to offset the dividend requirements of the shareholders.
(3) A small portion of the earnings is kept to meet emergent and occasional financial needs.	(3) These companies increase the amount of dividends gradually as the profitable investment opportunities start falling.

B) CONSTRAINTS ON PAYING DIVIDENDS

(i) Legal:

(ii) **Liquidity:** Payment of dividends means outflow of cash. Ability to pay dividends depends on cash and liquidity position of the firm. A mature company does not have much investment opportunities, nor its funds tied up in permanent working capital and, therefore has a sound cash position. A growth oriented company in spite of having good profits need funds to expand its operations and permanent working capital and therefore it is less likely to declare dividends.

(iii) **Access to the Capital Market:** By paying large dividends, cash position is affected. So, if new shares have to be issued to raise funds for financing investment programmes and if the existing shareholders cannot buy additional shares, then their control is diluted. In such a situation, payment of dividends may be withheld and earnings are utilised for financing firm's investment opportunities.

(iv) **Investment Opportunities:** If investment opportunities are inadequate, it is better to pay dividends and raise external funds whenever necessary for such opportunities.

C) DESIRE OF SHAREHOLDERS: The desire of shareholders (whether they prefer regular income by way of dividend or maximize their wealth by way of gaining on sale of the shares) is also an important point to be considered by the companies. The small shareholders are concerned with regular dividend income, hence, some select group of companies paying regular and liberal dividend.

As compared to those shareholders who prefer regular dividend as source of income, there are shareholders who prefer to gain on sale of shares at times when shares command higher price in the market. However, capital gain on sale of shares attracts tax on such gain and rates vary on the basis of holding period.

The dividend policy, thus pursued by the company should strike a balance on the desires of the shareholders. Also, the dividend policy once established should be continued as long as possible without interfering with the needs of the company to create a positive clientele effect.

D) STABILITY OF DIVIDENDS: Stability in dividend can be maintained by fixing the amount or rate of dividend irrespective of the earnings of the company. The stable dividend policies may include:

i) Constant Dividend per Share: Shareholders are given fixed amount of dividend irrespective of actual earnings. The amount of dividend may increase or decrease later on depending upon the financial health of the company but it is generally maintained for a considerable period of time.

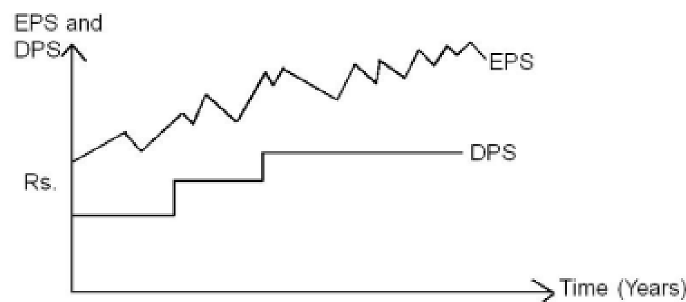


Fig. 1 Constant Dividend per share policy

To maintain a constant dividend amount, it is necessary to create a reserve like Dividend Equalisation Reserve Fund earmarked by marketable securities for accumulation of surplus earnings and to use it for paying dividends in those years where the company's performance is not good.

This policy treats common shareholders at par with preference shareholders without giving them any preferred opportunities within the firm.

It is preferred by persons and institutions that depend on dividend income to meet their living and operating expenses.

ii) **Constant Percentage of Net Earnings:** The ratio of dividend to earnings is known as Payout ratio. Some companies follow a policy of constant Payout ratio i.e. paying fixed percentage on net earnings every year. To quote from Page 74 of the annual report 2011 of Infosys Technologies Limited,

"The Dividend Policy is to distribute up to 30% of the Consolidated Profit after Tax (PAT) of the Infosys Group as Dividend."

Contrary to this, Warren Buffet (amongst the richest persons of the world) says:

"We will either pay large dividends or none at all if we can't obtain more money through re-investment (of those funds). There is no logic to regularly paying out 10% or 20% of earnings as dividends every year."

Such a policy (as mentioned by Warren Buffet) envisages that the amount of dividend fluctuates in direct proportion to earnings. If a company adopts 40% payout ratio, then 40% of every rupee of net earnings will be paid out. If a company earns ` 2 per share, dividend per share will be 80 paise and if it earns ` 1.50 per share, dividend per share will be 60 paise.

Hence, such a policy is related to company's ability to pay dividends. For losses incurred, no dividend shall be paid. Internal financing with retained earnings is automatic. At any given payout ratio, amount of dividend and any addition to retained earnings increase with increased earnings and decrease with decreased earnings.

This policy has a conservative approach and provides a guarantee against over/underpayment. Management is not allowed to pay dividend if profits are not earned in current year. Conversely, dividend is not allowed to be foregone if profits are earned.

iii) **Small Constant Dividend per Share plus Extra Dividend:** The amount of dividend is set at high level and the policy is adopted for companies with stable earnings. For companies with fluctuating earnings, the policy is to pay a minimum dividend per share with a step up feature. The small amount of dividend is fixed to reduce the possibility of missing dividend payment. By paying extra dividend in period of prosperity, it enables the company to pay constant amount of dividend regularly without default and allows flexibility for supplementing shareholders' income when company's earnings are higher than usual, without committing to make larger payments as part of further fixed dividend. This policy allows some shareholders to plan on set amounts of cash and at the same time be pleased when extra dividends are announced.

A firm following policy of stable dividend in Figure 1 will command higher market price for shares than the firm which varies dividend with cyclical fluctuation in earnings as in Figure 2.

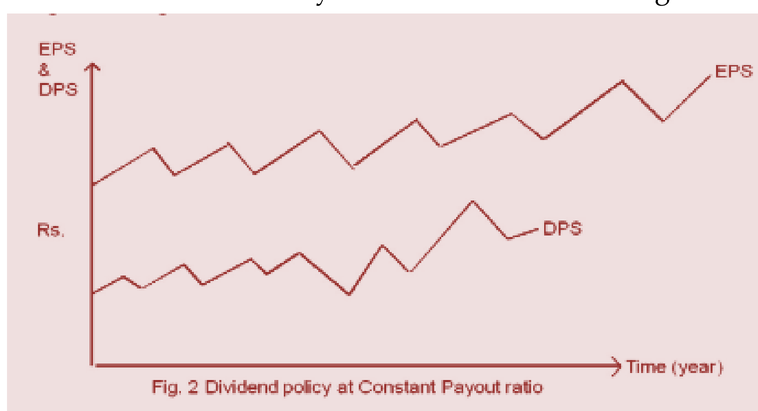


Fig. 2 Dividend policy at Constant Payout ratio

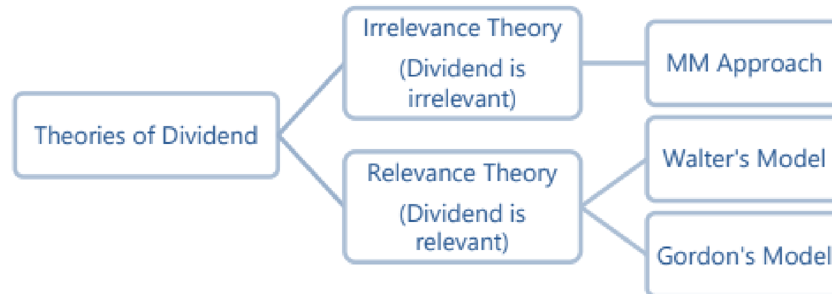
There is, however, a danger for a company with a pattern of stable dividends missing dividend payment in a year as this break will have severe effect on investors than failure to pay dividend by a company with unstable dividend policy.

It is prudent for companies to maintain stability of dividends during lean periods.

The dividend rate is to be fixed at a conservative figure so that it can be maintained even in such periods.

To give benefit of company's prosperity, extra dividend can be declared. If the company fails to pay extra dividend, it does not have a depressing effect on investors.

8.8 THEORIES OF DIVIDEND



8.8.1 DIVIDEND'S IRRELEVANCE THEORY

MODIGLIANI and MILLER (MM) HYPOTHESIS:

- Modigliani - Miller theory was proposed by Franco Modigliani and Merton Miller in 1961.
- MM approach is in support of the irrelevance of dividends i.e. firm's dividend policy has no effect on either the price of a firm's stock or its cost of capital.

According to MM hypothesis

- Market value of equity shares of a firm depends solely on its earning power and is not influenced by the manner in which its earnings are split between dividends and retained earnings.
- Market value of equity shares is not affected by dividend size.

Assumptions of MM Hypothesis

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.

Situations under MM Hypothesis

Keeping in mind assumptions under MM Hypothesis, firms may have three possible situations regarding the payment of dividend as follows:

1. **Firm pays cash dividends from Reserve & Surplus:** In this situation, the shareholders receive cash (dividend) from the firm, thereby, reducing the cash balance of the firm. There is only transfer of asset (cash) from one pocket to another pocket of the shareholders with no net gain or loss. So, payment of cash dividend will not affect the value of the firm.
2. **Firm pays cash dividends from new issue of shares:** If the firm does not have sufficient cash available for dividend, it will issue new shares and therefore will use the amount received for the payment of dividend. Here, shareholders receive cash (dividend) but suffer an equal amount of capital loss due to

dilution of control over the assets of the company and dilution in earning per share. With the increase in the total number of shares, earning per share will also reduce. Thus, there is no change in the wealth of shareholders.

3. **Firm does not pay any dividend:** When the firm doesn't pay any dividend, but shareholder want to receive cash, then shareholder may sell part of his/her shareholding in market. Therefore, the cash received in the hands of the shareholder may be known as "home-made dividend". In this situation also, the shareholder receives cash (capital receipt) but lose in the form of capital loss due to dilution of control over the assets of the company among the existing and new shareholders. Hence, there will be no gain or loss and the value of the firm will remain unchanged.

Let us understand the different possible situations through an example as below:

EXAMPLE - 2:

For the year ending 31st March 2021, Dev Ltd. has 2 lakhs outstanding equity shares with market price of ` 10 per share with no other external borrowings since the company follows no borrowing policy. The company has used all its retained earnings for capital expenditure. The company also pays a constant dividend of ` 3 per share and its cost of capital is 10%.

Now analyzing both situations i.e. when dividends are (i) not paid and (ii) paid.

i) If dividends are not paid, then the total no. of equity shares will remain same as no new shares are issued.

Market price per share (P_1) $= P_o (1+ K_e) - D_1$

$= 10 (1+ 0.10) - 0 =$ ` 11

Value of Firm = ` 11 x 2,00,000 shares = ` 22,00,000

ii) As the company strictly follows the no borrowing policy, then to pay the dividend of ` 3 per share, it will have to issue new shares to finance the dividend payment as no retained earnings is available.

Market price per share (P1) $= Po (1+ K_e) - D_1$

$= 10 (1+ 0.10) - 3 =$ ` 8

Market price per share (P_1) $= P_o (1+ K_e) - D_1$

$= 10 (1+ 0.10) - 3 = ₹ 8$

$$\text{No. of new shares to be issued} = \frac{\text{Funds required (i.e. total dividend to be paid)}}{P_1}$$

$$= \frac{2,00,000 \text{ shares} \times ₹\,3}{₹\,8} = 75,000 \text{ shares}$$

Thus, it can be seen from the above example that the value of the firm remains the same in either case.

MM hypothesis is primarily based on the arbitrage argument. Through the arbitrage process, MM hypothesis discusses how the value of the firm remains same whether the firm pays dividend or not. Here, market price of shares can be calculated as follows:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

P_o = Price in the beginning of the period

P_1 = Price at the end of the period

D_1 = Dividend at the end of the period

K_e = Cost of equity/ rate of capitalization/ discount rate

As per MM hypothesis, the value of firm will remain unchanged due to dividend decision. This can be computed with the help of the following formula:

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$$

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

For Understanding purpose:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

The above equation is for one share. Let's multiply it with n i.e. existing number of shares on both sides:

$$nP_o = \frac{nP_1 + nD_1}{1 + K_e}$$

Further, retained earnings could be represented with the help of following:

$$\text{Retained earnings} = E - nD_1$$

Δn i.e. number of shares issued to raise the funds required can be represented as follows:

$$\Delta n = \frac{\text{Funds required}}{\text{Price at end } (P_1)} = \frac{I - (E - nD_1)}{P_1}$$

$$\text{Or, } \Delta nP_1 = I - (E - nD_1)$$

Now putting value of ΔnP_1 in the equation:

$$nP_o = \frac{nD_1 + (nP_1 + \Delta nP_1) - [I - (E - nD_1)]}{1 + K_e}$$

$$nP_o = \frac{nD_1 + (n + \Delta n)P_1 - I + E - nD_1}{1 + K_e}$$

$$nP_o = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$$

Advantages of MM Hypothesis

1. This model is **logically consistent.**

2. It provides a **satisfactory framework** on dividend policy with the concept of Arbitrage process.

Limitations of MM Hypothesis

1. Validity of various **assumptions is questionable.**

2. This model **may not be valid under uncertainty.**

PROBLEM : 1

AB Engineering Ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at ` 100 each. The firm is contemplating the declaration of a dividend of '5 share at the end of the current financial year. It expects to have a net income of ` 1,00,000 and has a proposal for making new investments of ` 2,00,000. CALCULATE the value of the firm when dividends (i) are not paid (ii) are paid. **(Study Material)**

SOLUTION : 1

CASE 1: Value of the firm when dividends are not paid.

Step 1 : Calculate price at the end of the period

K_e= -10%, P_0= 100, D_1= 0

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.10} \quad » \quad P_1 = 110$$

Step 2: Calculation of funds required for investment

Earning	` 1,00,000
Dividend distributed	Nil
Fund available for investment	` 1,00,000
Total Investment	` 2,00,000
Balance Funds required	` 2,00,000 - ` 1,00,000 = ` 1,00,000

Step 3 : Calculation of No. of shares required to be issued for balance funds

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{1,00,000}{110}$$

Step 4: Calculation of value of firm

$$nP_0 = \frac{(n+\Delta n)P_1 - I + E}{1+K_e}$$

$$nP_0 = \frac{\left(10,000 + \frac{₹1,00,000}{₹110}\right) \times ₹110 - ₹2,00,000 + ₹1,00,000}{(1+0.10)}$$

$$= ₹\ 10,00,000$$

CASE 2 : Value of the firm when dividends are paid.

Step 1: Calculate price at the end of the period

$K_e = 10\%$, $P_0 = 100$, $D_1 = 5$

$$P_0 = \frac{P_1 + D_1}{1+K_e}$$

$$100 = \frac{P_1 + 5}{1+0.10} \quad » \quad P_1 = 105$$

Step 2: Calculation of funds required for investment

Earning	` 1,00,000
Dividend distributed	` 50,000
Fund available for investment	` 50,000
Total Investment	` 2,00,000
Balance Funds required	` 2,00,000 - ` 50,000 = ` 1,50,000

Step 3: Calculation of No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{₹1,50,000}{₹105}$$

Step 4: Calculation of value of firm

$$nP_0 = \frac{(n+\Delta n)P_1 - I + E}{1+K_e}$$

$$nP_0 = \frac{\left(10,000 + \frac{₹1,50,000}{₹105}\right) \times ₹105 - ₹2,00,000 + ₹1,00,000}{(1+0.10)}$$

$$= ₹\ 10,00,000$$

Thus, it can be seen from the above illustration that the value of the firm remains the same in either case.

*****

8.8.2 DIVIDEND'S RELEVANCE THEORY

1. WALTER'S MODEL

Assumptions of Walter's Model

Walter's approach is based on the following assumptions:

- All investment proposals of the firm are to be financed **through retained earnings** only.
- **'r'** rate of return & **'Ke'** cost of capital are constant.
- **Perfect capital markets:** The firm operates in a market in which all investors are rational and information is freely available to all.
- **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.
- **No floatation or transaction cost:** Similarly, these costs may differ country to country or market to market.
- The firm has **perpetual life**

The relationship between dividend and share price based on Walter's formula is shown below:

$$\text{Market Price (P)} = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

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

The above formula is given by Prof. James E. Walter which shows how dividend can be used to maximise the wealth of equity holders.

A close study of the formula indicates that Professor Walter emphasises two factors which influence the market price of a share which are:

1. Dividend per share
2. Relationship between Internal Rate of Return (IRR) and Cost of capital (K_e) [i.e.Market capitalization rate]

If the internal return of retained earnings is higher than market capitalization rate, the value of ordinary shares would be high even if dividends are low.

However, if the internal return within the business is lower than what the market expects, the value of the share would be low.

In such a case, shareholders would prefer a higher dividend so that they can utilise the funds so obtained elsewhere in more profitable opportunities.

Walter's Model explains why market prices of shares of growing companies are high even though the dividend paid out is low. It also explains why the market price of shares of certain companies which pay higher dividends and retain very low profits is also high.

IRR, Ke and optimum payout

As we know that Walter's approach considers two factors, following can be concluded from this model:

Company	Condition of r vs K_e	Correlation between Size of Dividend and Market Price of share	Optimum dividend payout ratio
Growth	$r > K_e$	Negative	Zero
Constant	$r = K_e$	No correlation	Every payout ratio is optimum
Decline	$r < K_e$	Positive	100%

- **Growth Oriented Company:** In this condition, a company is able to invest/utilize the fund in a better manner. Therefore, shareholders can accept low dividend because their value of share would be higher.
- **Declining Company:** In this condition, a company is not in a position to cover the cost of capital. Therefore, shareholders would prefer a higher dividend so that they can utilize their funds elsewhere in

more profitable opportunities.

Advantages of Walter's Model

1. The formula is **simple to understand** and easy to compute.
2. It can envisage **different possible market prices** in different situations and considers internal rate of return, market capitalisation rate and dividend payout ratio in the determination of market value of shares.

Limitations of Walter's Model

- The formula **does not consider all the factors** affecting dividend policy and share prices. Moreover, determination of market capitalisation rate is difficult.
- Further, the formula **ignores such factors as taxation**, various legal and contractual obligations, management policy and attitude towards dividend policy and so on.

PROBLEM : 2

XYZ Ltd. earns `10/ share. Capitalization rate and return on investment are 10% and 12% respectively. DETERMINE the optimum dividend payout ratio and the price of the share at the payout.(Study Material)

SOLUTION : 2

Since r > Ke , the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0),

Accordingly, value of a share:

$$P = \frac{D + \frac{r}{Ke}(E - D)}{K_e}$$

$$P = \frac{0 + \frac{0.12}{0.10}(10 - 0)}{0.10} = ₹120$$

The optimality of the above payout ratio can be proved by using 25%, 50%, 75% and 100% as pay- out ratio:

At 25% pay-out ratio

At 25% pay-out ratio

$$P = \frac{2.5 + \frac{0.12}{0.10}(10 - 2.5)}{0.10} = ₹\ 115$$

At 50% pay-out ratio

$$P = \frac{5 + \frac{0.12}{0.10}(10 - 5)}{0.10} = ₹\ 110$$

At 75% pay-out ratio

$$P = \frac{7.5 + \frac{0.12}{0.10}(10 - 7.5)}{0.10} = ₹\ 105$$

At 100% pay-out ratio

$$P = \frac{10 + \frac{0.12}{0.10}(10 - 10)}{0.10} = ₹\ 100$$

*****

PROBLEM : 3

The following figures are collected from the annual report of XYZ Ltd.:

Net Profit	` 30 lakhs
Outstanding 12% preference shares	`100 lakhs
No. of equity shares	3 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 `42 by using Walter's model? (Study Material + May 2019 – RTP + Similar Question in May 2022 – RTP + Oct. 2019 – MTP – 5 Marks + Nov. 2020 Exam – 5 Marks + March 2024 MTP – 5 Marks)

SOLUTION : 3

	`in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Earning per share	18/3 = ` 6.00

Let, the dividend per share be D to get share price of ` 42

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$₹\ 42 = \frac{D + \frac{0.20}{0.16}(6 - D)}{0.16}$$

$$6.72 = \frac{0.16D + 1.2 - 0.20D}{0.16}$$

$$0.04D = 1.2 - 1.0752$$

$$D = 3.12$$

$$\text{D/P ratio} = \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$$

So, the required dividend payout ratio will be = 52%

*****

2. GORDON'S MODEL

According to Gordon's model, dividend is relevant and dividend policy of a company affects its value.

Assumptions of Gordon's Model

This 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 remains constant,** because change in discount rate will affect the present value.
- **Retention ratio** (b), once decide 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 variable 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.

The following formula is used by Gordon to find out price per share:

$$P_0 = \frac{E_1(1 - b)}{K_e - br}$$

Where,

P_0	=	Price per share
E_1	=	Earnings per share
b	=	Retention ratio; (1 - b = Payout ratio)
K_e	=	Cost of capital
r	=	IRR
br	=	Growth rate (g)

According to Gordon's model, when **IRR is greater than cost of capital, the price per share increases and dividend pay-out decreases.** On the other hand, when IRR is lower than the cost of capital, the price per share decreases and dividend pay-out increases.

Following is the conclusion of Gordon's model:

Company	Condition of r vs Ke	Optimum dividend payout ratio
Growth	r > Ke	Zero
Constant	r = Ke	There is no optimum ratio
Declining	r < Ke	100%

PROBLEM : 4

The following figures are collected from the annual report of XYZ Ltd.:

Net Profit	` 30 lakhs
Outstanding 12% preference shares	` 100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of capital i.e. (Ke)	16%

CALCULATE price per share using Gordon's Model when dividend pay-out is (i) 25%; 50% and (iii) 100%.

(Study Material)

SOLUTION : 4

	` in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Earning per share	18/3 = ` 6.00

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, E1 = 6, Ke = 16%

(i) When dividend pay-out is 25%

$$P_0 = \frac{6 \times 0.25}{0.16 - (0.75 \times 0.2)} = \frac{1.5}{0.16 - 0.15} = 150$$

(ii) When dividend pay-out is 50%

$$P_0 = \frac{6 \times 0.5}{0.16 - (0.5 \times 0.2)} = \frac{3}{0.16 - 0.10} = 50$$

(iii) When dividend pay-out is 100%

$$P_0 = \frac{6 \times 1}{0.16 - (0 \times 0.2)} = \frac{6}{0.16} = 37.50$$

*****

THE "BIRD-IN-HAND THEORY" - GORDON'S REVISED MODEL

Myron Gordon revised his dividend model and considered the risk and uncertainty in his model. The Bird-in-hand theory of Gordon has two arguments:

(i) Investors are **risk averse** and

(ii) Investors put a **premium on certain return** and discount on uncertain return.

- Gordon argues that what is available at present is preferable to what may be available in the future.
- As investors are rational, they want to avoid risk and uncertainty.
- They would prefer to pay a higher price for shares on which current dividends are paid.
- Conversely, they would discount the value of shares of a firm which postpones dividends.

- The discount rate would vary with the retention rate.
- The relationship between dividend and share price on the basis of Gordon's formula is shown as:

$$\text{Market price per share}(P_0) = \left[\frac{D_0(1+g)}{K_e - g}\right]$$

Where,

P_0 = Market price per share (ex-dividend)

D_o = Current year dividend

g = Constant annual growth rate of dividends

Ke = Cost of equity capital (expected rate of return).

- The formula given by Gordon shows that when the rate of return (r) is greater than the discount rate (Ke), the price per share increases as the dividend ratio decreases and the vice-versa.
- On the other hand, if the rate of return (r) is less than discount rate (Ke), the price per share increases as the dividend ratio increases and the vice- versa.
- The price per share remains unchanged where the rate of return and discount rate are equal.

DIVIDEND DISCOUNT MODEL (DDM)

It is a financial model that values shares at the discounted value of the future dividend payments.

Under this model, the price of a share that will be traded is calculated by the PV of all expected future dividend payment discounted by an appropriate risk- adjusted rate.

The dividend discount model price is the intrinsic value of the stock i.e.

Intrinsic value = Sum of PV of future cash flows

Intrinsic value = Sum of PV of Dividends + PV of Stock Sale Price

$$\text{Stock Intrinsic Value} = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + ... + \frac{D_n}{(1+K_e)^n} + \frac{RV_n}{(1+K_e)^n}$$

In the above equation, it is assumed that dividend is paid at the end of each year and that the stock is sold at the end of the nth year.

There can three possible situations:

(a) Zero growth rates: assumes all dividend paid by a stock remains same. In this case the stock price would be equal to:

$$\text{Stock's intrinsic Value} = \frac{\text{Annual dividend}}{\text{Required rate of return}}$$

$$\text{i.e.} \quad P_0 = \frac{D}{K_e}$$

Where,

D = Annual dividend

K_e = Cost of capital

P_0 = Current Market price of share

PROBLEM : 5

X Ltd. is a no growth company, pays a dividend of `5 per share. If the cost of capital is 10%, COMPUTE the current market price of the share? (Study Material)

SOLUTION : 5

$$P_0 = \frac{D}{K_e} = \frac{5}{0.10} = ₹\,50$$

(b) Constant Growth Rate (Gordon's Growth Model): The relationship between dividend and share price on the basis of Gordon's formula is:

$$\text{Market price per share (P)} = \frac{D_0(1+g)}{K_e - g}$$

Where

P = Market price per share

D_1 = current year dividend

g = growth rate of dividends

Ke = cost of equity capital/ expected rate of return

Notes:

g = b x r

b = proportion of retained earnings or (1- dividend payout ratio)

PROBLEM : 6

XYZ is a company having share capital of ` 10 lakhs of ` 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(Study Material)

SOLUTION : 6

$$P = \frac{D_0(1+g)}{K_e - g}$$

$$= \frac{2(1+0.02)}{0.15-0.02} = ₹\ 15.69$$

*****

c) Variable growth rate : Variable-growth rate models (multi-stage growth models) can take many forms, even assuming the growth rate is different for every year. However, the most common form is one that assumes 3 different rates of growth: an initial high rate of growth, a transition to slower growth, and lastly, a sustainable, steady rate of growth. Basically, the constant-growth rate model is extended, with each phase of growth calculated using the constant-growth method but using 3 different growth rates of the 3 phases. The present values of each stage are added together to derive the intrinsic value of the stock. Sometimes, even the capitalization rate, or the required rate of return, may be varied if changes in the rate are projected.

PROBLEM : 7

A firm had paid dividend at ` 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 FIND OUT the present market price of the share, given that the required rate of return of the equity investors is 15%. (Study Material)

SOLUTION : 7

In the present situation, the current MPS is as follows:

In the present situation, the current MPS is as follows:

$$P = \frac{D_0(1+g)}{K_e - g}$$

$$P = \frac{2(1+0.05)}{0.15-0.05} = ₹\ 21$$

(i) The impact of changes in growth rate to 8% on MPS will be as follows:

$$P = \frac{2(1+0.08)}{0.15-0.08} = ₹\ 30.86$$

(ii) The impact of changes in growth rate to 3% on MPS will be as follows:

$$P = \frac{2(1+0.03)}{0.15-0.03} = ₹\ 17.17$$

So, the market price of the share is expected to vary in response to change in expected growth rate of dividends.

Advantages of Gordon's Model

1. The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows.
2. This Model is easy to understand.

Limitations of Gordon's Model

1. The dividend discount model depends on projections about company growth rate and future capitalization rates of the remaining cash flows, which may be difficult to calculate accurately.
2. The true intrinsic value of a stock is difficult to determine realistically.

8.8.3. TRADITIONAL MODEL

1. GRAHAM & DODD MODEL

According to the traditional position expounded by Graham & Dodd, the stock market places considerable weight on dividends than on retained earnings. Their view is expressed quantitatively in the following valuation model:

$$P = m\left(D + \frac{E}{3}\right)$$

Where,

P = Market price per share

D = Dividend per share

E = Earnings per share

m = a multiplier

PROBLEM : 8

The earnings per share of a company is ` 30 and dividend payout ratio is 60%. Multiplier is 2. DETERMINE the price per share as per Graham & Dodd model. **(Study Material)**

SOLUTION : 8

$$\text{Price per share (P)} = m\left(D + \frac{E}{3}\right)$$

$$P = 2\left(30 \times 0.6 + \frac{30}{3}\right)$$

$$P = 2(18 + 10) = ₹\ 56$$

*****

PROBLEM : 9

The following information regarding the equity shares of M Ltd. is given below:

Market price	**` 58.33**
Dividend per share	**` 5**
Multiplier	**7**

According to the Graham & Dodd approach to the dividend policy, COMPUTE the EPS.
(Study Material)

SOLUTION : 9

$$\text{Price per share (P)} = m\left(D + \frac{E}{3}\right)$$

$$₹\ 58.33 = 7\left(5 + \frac{E}{3}\right)$$

$$105 + 7E = 175$$

$$\text{Or, } 7E = 175 - 105 = ₹10$$

$$\text{Therefore, EPS} = ₹10$$

*****

2. LINTER'S MODEL

Linter's model has two parameters:

(i) The target payout ratio,

(ii) The spread at which current dividends adjust to the target.

John Linter based his model on a series of interviews which he conducted with corporate managers in the mid 1950's. While developing the model, he considers the following assumptions:

1. **Firm have a long term dividend payout ratio.** They maintain a fixed dividend payout over a long term. Mature companies with stable earnings may have high payouts and growth companies usually have low payouts.
2. **Managers are more concerned with changes in dividends than the absolute amounts of dividends.** A manager may easily decide to pay a dividend of ' 2 per share if last year too it was ' 2 but paying ' 3 dividend if last year dividend was ' 2 is an important financial management decision.
3. **Dividend changes follow changes in long run sustainable earnings.**
4. **Managers are reluctant to affect dividend changes that may have to be reversed.**

Under Linter's model, the current year's dividend is dependent on current year's earnings and last year's dividend.

$$D_1 = D_o + [(EPS \times Target\ payout) - D_o] \times Af$$

Where,

D_1 = Dividend in year 1

D_o = Dividend in year 0 (last year dividend)

EPS = Earnings per share

Af = Adjustment factor or Speed of adjustment

PROBLEM : 10

Given the last year's dividend is ` 9.80, speed of adjustment of 45%, target payout ratio is 60% and EPS for current year ` 20. COMPUTE current year's dividend using Linter's model.

(Study Material)

SOLUTION : 10

D_1 = D_o + [(EPS xTarget payout) - D0] x Af

D_1 = 9.80 + [(20 x 60%) - 9.80] x 0.45

D_1 = 9.80 + 0.99 = `10.79

Criticism of Linter's Model

*****

8.9 STOCK SPLITS

8.9.1 Meaning of Stock Split

- This model does not offer a market price for the shares.
  The adjustment factor is an arbitrary number and not based on any scientific criterion or method.
- Stock split means splitting **one share into many**, say, one share of ` 500 in to 5 shares of ` 100.
- Stock splits is a tool used by the companies to regulate the prices of shares i.e. if a share price increases beyond a limit, it may become less tradable.
- Example - suppose a company's share price increases from ` 50 to ` 1000 over the years, it is possible that it might goes out of range of many investors.

8.9.2 Advantages of Stock Splits

1. It makes the **share affordable** to small investors.
2. **Number of shares may increase** the number of shareholders; hence the potential of investment may

increase.

8.9.3 Limitations of Stock Splits

1. **Additional expenditure** needs to be incurred on the process of stock split.
2. **Low share price may attract speculators** or short term investors, which are generally not preferred by any company.

MISCELLANEOUS ILLUSTRATIONS

PROBLEM : 11

RST Ltd. has a capital of ` 10,00,000 in equity shares of ` 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of ` 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 market price of the share at the end of the year, if

(i) dividend is not declared

(ii) dividend is declared

Assuming that the company pays the dividend and has net profits of `5,00,000 and makes new investments of ` 10,00,000 during the period, CALCULATE number of new shares to be issued? Use the MM model.
(Study Material + Oct. 2018 – MTP – 5 Marks)

SOLUTION : 11

Given,

Cost of Equity (Ke)	12%
Number of shares in the beginning (n)	10,000
Current Market Price (P0)	` 100
Net Profit (I)	` 5,00,000
Expected Dividend (D1)	` 10 per share
Investment (I)	` 10,00,000

Computation of market price per share, when:

(i) No dividend is declared:

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.12}$$

$$P_1 = 112 - 0 = ₹\ 112$$

(ii) Dividend is declared:

$$100 = \frac{P_1 + 10}{1 + 0.12}$$

$$P_1 = 112 - 10 = ₹\ 102$$

Calculation of number of shares required for investment

	`
Earning	5,00,000
Dividend distributed	1,00,000
Fund available for investment	4,00,000
Total Investment	10,00,000
Balance Funds required	10,00,000 - 4,00,000 = 6,00,000

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{6,00,000}{102} = 5,882.35 \text{ or } 5,883 \text{ Shares}$$

*****

PROBLEM : 12

The following information pertains to M/s XY Ltd.

Earnings of the Company	**` 5,00,000**
Dividend Payout ratio	**60%**
No. of shares outstanding	**1,00,000**
Equity capitalization rate	**12%**
Rate of return on investment	**15%**

CALCULATE:

(i) **Market value per share as per Walter's model.**

(ii) **Optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio.** **(Study Material + Nov. 2019 - RTP)**

SOLUTION : 12

i) 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 = ` 5

D = Dividend per share = ` 3

R = Return earned on investment = 15%

K_e = Cost of equity capital = 12%

$$P = \frac{3 + \frac{0.15}{0.12}(5 - 3)}{0.12} = ₹\ 45.83$$

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 pay-out ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + \frac{0.15}{0.12}(5 - 0)}{0.12} = ₹\ 52.08$$

*****

PROBLEM : 13

Taking an example of three different firms i.e. growth, normal and declining, CALCULATE the share price using Gordon's model.

Factors	Growth Firm $r > K_e$	Normal Firm $r = K_e$	Declining Firm $r < K_e$
r (rate of return on retained earnings)	15%	10%	8%
K_e (Cost of Capital)	10%	10%	10%
E (Earning Per Share)	` 10	` 10	` 10
b (Retained Earnings)	0.6	0.6	0.6
1- b (Dividend Payout)	0.4	0.4	0.4

(Study Material)

SOLUTION : 13

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

(i) Situation-1: Growth Firm r > K_e

$$P_0 = \frac{10(1-0.6)}{0.10-0.15\times0.6} = \frac{4}{0.10-0.09} = ₹\ 400$$

(ii) Situation-2: Normal Firm r = K_e

$$P_0 = \frac{10(1-0.6)}{0.10-0.10\times0.6} = \frac{4}{0.10-0.06} = ₹\ 100$$

(ii) Situation-2: Normal Firm r < K_e

$$P_0 = \frac{10(1-0.6)}{0.10-0.08\times0.6} = \frac{4}{0.10-0.048} = ₹\ 76.92$$

If the retention ratio (b) is changed from 0.6 to 0.4, the new share price will be as follows:

Growth Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.15\times0.4} = \frac{6}{0.10-0.06} = ₹\ 150$$

Normal Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.10\times0.4} = \frac{6}{0.10-0.04} = ₹\ 100$$

Declining Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.08\times0.4} = \frac{6}{0.10-0.032} = ₹\ 88.24$$

From the above analysis, it can be concluded that:

When r > k, the market value increases with retention ratio.

When r < k, the market value of share stands to decrease.

When r = k, the market value is not affected by dividend policy.

The conclusion of the Gordon's model is similar to that of Walter's model.

*****

PROBLEM : 14

The following information is given below in case of Aditya Ltd.:

Earnings per share = `60

Capitalisation rate = 15%

Return on investment = 25%

Dividend payout ratio = 30%

(i) COMPUTE price per share using Walter's Model.

(ii) WHAT would be optimum dividend payout ratio per share under Gordon's Model. (Study Material)

SOLUTION : 14

i) As per Walter's Model, Price per share is computed by using the following formula:

$$P = \frac{D + \frac{r}{K_e}(E-D)}{K_e}$$

Where,

P = Market Price of the share.

E = Earnings per share.

D = Dividend per share.

Ke = Cost of equity/ rate of capitalization/ discount rate.

r = Internal rate of return/ return on investment

Applying the above formula, price per share

$$P = \frac{18 + \frac{0.25}{0.15}(60 - 18)}{0.15}$$

$$\text{Or, } P = \frac{18 + 70}{0.15} = ₹\ 586.67$$

ii) As per Gordon's model, when r > Ke, optimum dividend payout ratio is 'Zero'.

*****

SUMMARY

- Dividend decision is one of the most important areas of management decisions. It is easy to understand but difficult to implement. Generally, the dividend can be in the form of Cash Dividend and Stock Dividend.
- Dividend policy is generally governed by long term financing decision and wealth maximization decision. Some other factors also play major role in this decision like growth opportunities, expectation of shareholders, trend of the industry, legal constraints etc.
- The three major theories of dividend decision are classified under irrelevance (M.M. Hypothesis) and relevance category (Walter's model & Gordon's Model). However, few other theories studied in this chapter are Graham & Dodd's model and Linter model.
- Further, we studied stock splits as a tool to maintain price range so that it does not move too high to become unaffordable for a wide range of investors.

TEST YOUR KNOWLEDGE

MCQs based Questions

1. Which one of the following is the assumption of Gordon's Model:

a) Ke > g

b) Retention ratio, (b), once decide upon, is constant

c) Firm is an all equity firm

d) All of the above

2. What should be the optimum Dividend pay-out ratio, when r = 15% & Ke = 12%:

a) 100%

b) 50%

c) Zero

d) None of the above.

3. Which of the following is the irrelevance theory?

a) Walter model

b) Gordon model

c) M.M. hypothesis

d) Linter's model

4. If the company's D/P ratio is 60% & ROI is 16%, what should be the growth rate?

a) 5%

b) 7%

c) 6.4%

d) 9.6%

5. If the shareholders prefer regular income, how does this affect the dividend decision:

a) It will lead to payment of dividend

b) It is the indicator to retain more earnings

c) It has no impact on dividend decision

d) Can't say

6. Mature companies having few investment opportunities will show high payout ratios, this statement is:

a) False

b) True

c) Partial true

d) None of these

7. Which of the following is the limitation of Linter's model?

a) This model does not offer a market price for the shares.

b) The adjustment factor is an arbitrary number and not based on any scientific criterion or methods.

c) Both (a) & (b)

d) None of the above.

8. What are the different options other than cash used for distributing profits to shareholders?

a) Bonus shares

b) Stock split

c) Both (a) and (b)

d) None of the above

9. Which of the following statement is correct with respect to Gordon's model?

a) When IRR is greater than cost of capital, the price per share increases and dividend pay-out decreases.

b) When IRR is greater than cost of capital, the price per share decreases and dividend pay-out increases.

c) When IRR is equal to cost of capital, the price per share increases and dividend pay-out decreases.

d) When IRR is lower than cost of capital, the price per share increases and dividend pay-out decreases.

10. Compute EPS according to Graham & Dodd approach from the given information:

Market price	` 56
Dividend pay-out ratio	60%
Multiplier	2

a) ` 30

b) ` 56

c) ` 28

d) ` 84

11. Which among the following is not an assumption of Walter's Model?

a) Rate of return and cost of capital are constant

b) Information is freely available to all

c) There is discrimination in taxes

d) The firm has perpetual life

1.	(d)	2.	(c)	3.	(c)	4.	(c)	5.	(a)	6.	(b)
7.	(c)	8.	(a)	9.	(a)	10.	(a)	11.	(c)		

Theoretical based Questions

1. STATE dividend decision? Briefly EXPLAIN the factors which govern this decision.
2. EXPLAIN the advantages and disadvantages of the stock dividend.
3. DISCUSS the practical considerations in dividend policy.
4. LIST out the assumptions of irrelevance theory.
5. EXPLAIN the parameters Linter's model of dividend policy. Also explain the reasons of its criticism.
6. State the meaning of stock split. Explain its advantages and disadvantages.
7. Briefly explain the assumptions of Walter's Model. **(May 2022 – Exam – 4 Marks)**

PRACTICAL PROBLEMS

PROBLEM : 15

The dividend payout ratio of H Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, COMPUTE P/E ratio. (Study Material)

SOLUTION : 15

The P/E ratio i.e. price earnings ratio can be computed with the help of the following formula:

$$P/E \text{ ratio} = \frac{MPS}{EPS}$$

Since the D/P ratio is 40%,

D = 40% of E i.e. 0.4E

Hence,

Market price per share (P) using Graham & Dodd's model:

$$P_0 = m\left(D + \frac{E}{3}\right)$$

$$P_0 = 9\left(0.4E + \frac{E}{3}\right)$$

$$P_0 = 9\left(\frac{1.2E + E}{3}\right) = 3\ (2.2E)$$

$$P_0 = 6.6E$$

$$\frac{P}{E} = 6.6 \text{ i.e. P/E ratio is 6.6 times}$$

*****

PROBLEM : 16

M Ltd. belongs to a risk class for which the capitalization rate is 10%. It has outstanding shares and the current market price is ` 100. It expects a net profit of ` 2,50,000 for the year and the Board is considering dividend of ` 5 per share.

M Ltd. requires to raise ` 5,00,000 for an approved investment expenditure. ILLUSTRATE, how the MM approach affects the value of M Ltd. if dividends are paid or not paid.

(Study Material + August 2018 – MTP – 5 Marks)

SOLUTION : 16

Given,

Cost of Equity (Ke)	10%
Number of shares in the beginning (n)	25,000
Current Market Price (P0)	` 100
Net Profit (E)	` 2,50,000

Expected Dividend (D1)	`5 per share
Investment (I)	` 5,00,000

Case 1 - When dividends are paid	Case 2 - When dividends are not paid
Step 1 $P_0 = \frac{P_1 + D_1}{1 + K_e}$ $100 = \frac{P_1 + 5}{1 + 0.10}$ P1 = 110 - 5 = 105	**Step 1** $P_0 = \frac{P_1 + D_1}{1 + K_e}$ $100 = \frac{P_1 + 0}{1 + 0.10}$ P1 = 110 - 0 = 110
Step 2 Calculation of funds required = Total Investment + (Net profit - Dividend) = 5,00,000 + (2,50,000 - 1,25,000) = 3,75,000	**Step 2** Calculation of funds required = Total Investment + (Net profit - Dividend) = 5,00,000 + (2,50,000 - 0) = 2,50,000
Step 3 No. of shares required to be issued for balance fund $\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$ $\Delta n = \frac{3,75,000}{105}$ $= 3,571.4285$	**Step 3** No. of shares required to be issued for balance fund $\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$ $\Delta n = \frac{2,50,000}{110}$ $= 2,272.73$
Step 4 Calculation of value of firm	**Step 4** Calculation of value of firm
$Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + k_e)}$ $Vf = \frac{\left(25,000 + \frac{3,75,000}{105}\right)105 - 5,00,000 + 2,50,000}{(1 + .10)}$ $= ₹\ 25,00,000$	$Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + k_e)}$ $Vf = \frac{\left(25,000 + \frac{2,50,000}{110}\right)110 - 5,00,000 + 2,50,000}{(1 + 0.10)}$ $= ₹\ 25,00,000$

PROBLEM : 17

The following information is supplied to you:

	`
Total Earnings	**2,00,000**
No. of equity shares (of ' 100 each)	**20,000**
Dividend paid	**1,50,000**
Price/ Earnings ratio	**12.5**

Applying Walter's Model:

(i) **ANALYSE whether the company is following an optimal dividend policy.**

(ii) **COMPUTE P/E ratio at which the dividend policy will have no effect on the value of the share.**

(iii) **Will your decision change, if the P/E ratio is 8 instead of 12.5? ANALYSE.**

(Study Material + May 2021 – RTP + Similar Question in Nov. 2021 – MTP – 5 Marks)

SOLUTION : 17

(i) The EPS of the firm is ` 10 (i.e.,` 2,00,000/ 20,000), r = ` 2,00,000/ (20,000 shares x `100) = 10%. The P/E Ratio is given at 12.5 and the cost of capital (Ke) may be taken at the inverse of P/E ratio. Therefore, Ke is 8 (i.e., 1/12.5). The firm is distributing total dividends of ` 1,50,000 among 20,000 shares, giving a dividend per share of ` 7.50. the value of the share as per Walter's model may be found as follows:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \frac{0.1}{0.08}(10 - 7.5)}{0.08} = ₹\ 132.81$$

(ii) The firm has a dividend payout of 75% (i.e., ` 1,50,000) out of total earnings of ` 2,00,000. Since, the rate of return of the firm (r) is 10% and it is more than the Ke of 8%, therefore, by distributing 75% 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:

$$= \frac{0 + \frac{0.1}{0.08}(10 - 0)}{0.08} = ₹\ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

(i) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the Ke would be equal to the rate of return (r) of the firm. The Ke would be 10% (= r) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

(ii) If the P/E is 8 instead of 12.5, then the Ke which is the inverse of P/E ratio, would be 12.5 and in such a situation ke> r and the market price, as per Walter's model would be:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \frac{0.1}{0.125}(10 - 7.5)}{0.125} = ₹\ 76$$

*****

PROBLEM : 18

With the help of following figures CALCULATE the market price of a share of a company by using:

(i) Walter's formula

(ii) Dividend growth model (Gordon's formula)

Earnings per share (EPS)	**` 10**
Dividend per share (DPS)	**` 6**
Cost of capital (Ke)	**20%**
Internal rate of return on investment	**25%**
Retention Ratio	**40%**

(Study Material + Similar Question in Nov. 2020 RTP + March 2019 – MTP – 5 Marks + March 2019 – MTP – 5 Marks + May 2019 Exam – 5 Marks + Similar Q. in Sept. 2022 MTP – 5 Marks)

SOLUTION : 18

Market price per share by

i) Walter's model

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{6 + \frac{0.25}{0.20}(10 - 6)}{0.20} = ₹\ 55$$

ii) Gordon's model

$$\text{Present market price per share } (P_o) = \frac{E(1 - b)}{k - br}$$

$$P_o = \frac{10\,(1 - 0.40)}{0.20 - (0.4 \times 0.25)}$$

$$= \frac{6}{0.1} = ₹\ 60$$

*****

PROBLEM : 19

The annual report of XYZ Ltd. provides the following information for the Financial Year 2020-21:

Particulars	**Amount (`)**
Net Profit	**50 lakhs**
Outstanding 15% preference shares	**100 lakhs**
No. of equity shares	**5 lakhs**
Return on Investment	**20%**
Cost of capital i.e. (K_e)	**16%**

CALCULATE price per share using Gordon's Model when dividend pay-out is:

(i) 25%;

(ii) 50%;

(iii) 100%. **(Study Material + Similar Question in March 2022 & Oct. 2022 – MTP – 5 Marks)**

SOLUTION : 19

Price per share according to Gordon's Model is calculated as follows:

Particulars	**Amount in `**
Net Profit	50 lakhs
Less: Preference dividend	15 lakhs
Earnings for equity shareholders	35 lakhs
Earnings per share	35 lakhs/5 lakhs = ` 7.00

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, E_1 = 7, K_e = 16%

(i) When dividend pay-out is 25%

$$P_0 = \frac{7 \times 0.25}{0.16 - (0.75 \times 0.2)} = \frac{1.75}{0.16 - 0.15} = ₹\ 175$$

(ii) When dividend pay-out is 50%

$$P_0 = \frac{7 \times 0.5}{0.16 - (0.5 \times 0.2)} = \frac{3.5}{0.16 - 0.10} = ₹\ 58.33$$

(iii) When dividend pay-out is 100%

$$P_0 = \frac{7 \times 1}{0.16 - (0 \times 0.2)} = \frac{7}{0.16} = ₹\ 43.75$$

*****

PROBLEM : 20

A&R Ltd. is a large-cap multinational company listed in BSE in India with a face value of ` 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 ` 120 as dividend per share for the FY 2020-21. The shares of the company traded at an average price of ` 3,122 on last day. FIND out the intrinsic value of per share and state whether shares are overpriced or underpriced. (Study Material)

SOLUTION : 20

As per Dividend discount model, the price of share is calculated as follows:

$$P=\frac{D_1}{(1+K_e)^1}+\frac{D_2}{(1+K_e)^2}+\frac{D_3}{(1+K_e)^3}+\frac{D_4}{(1+K_e)^4}+\frac{D_5}{(K_e-g)}\times\frac{1}{(1+K_e)^4}$$

Where,

P = Price per share

K_e = Required rate of return on equity

g = Growth rate

$$P=\frac{₹\ 120\times1.15}{(1+0.2)^1}+\frac{₹\ 138\times1.15}{(1+0.2)^2}+\frac{₹\ 158.7\times1.15}{(1+0.2)^3}+\frac{₹\ 182.5\times1.15}{(1+0.2)^4}+\frac{₹\ 209.88\times1.05}{(0.2-0.05)}\times\frac{1}{(1+0.2)^4}$$

P= 115 + 110.2 + 105.6 + 101.2 + 708.50 = ₹ 1,140.50

Intrinsic value of share is `1,140.50 as compared to latest market price of ` 3,122. Market price of a share is overpriced by ` 1,981.50

*****

PROBLEM : 21

In May 2020, shares of RT Ltd. was sold for ` 1,460 per share. A long term earnings growth rate of 7.5% is anticipated. RT Ltd. is expected to pay dividend of ` 20 per share.

(i) CALCULATE rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?

(ii) It is expected that RT 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?

(Study Material)

SOLUTION : 21

(i) According to Dividend Discount Model approach, the firm's expected or required return on equity is computed as follows:

$$K_e=\frac{D_1}{P_0}+g$$

$$K_e=\frac{20\,(1+0.075)}{1,460}+7.5\%$$

= 0.0147 +0.075 = 0.0897 or 8.97%

(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 x 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 7.5% and r =10%, the retention ratio comes out to be:

0.075 = b_1 x 0.10

b_1 = 0.75 and payout ratio = 0.25

With 0.25 payout ratio the EPS will be as follows:

$$\frac{₹\ 20}{0.25}=₹\ 80$$

With new 0.40 (1 - 0.60) payout ratio, the new dividend will be

D_1 = ` 80 x 0.40 = ` 32

Accordingly, new Ke will be

$$K_e=\frac{32}{1,460}+6.0\%$$

or, K_e = 8.19%

*****

PROBLEM : 22

Aakash Ltd. has 10 lakh equity shares outstanding at the start of the accounting year 2021. The existing market price per share is ? 150. Expected dividend is ? 8 per share. The rate of capitalization appropriate to the risk class to which the company belongs is 10%.

(i) **CALCULATE the market price per share when expected dividends are: (a) declared, and (b) not declared, based on the Miller - Modigliani approach.**

(ii) **CALCULATE number of shares to be issued by the company at the end of the accounting year on the assumption that the net income for the year is ` 3 crore, investment budget is ` 6 crores, when (a) Dividends are declared, and (b) Dividends are not declared.**

(iii) **PROOF that the market value of the shares at the end of the accounting year will remain unchanged irrespective of whether (a) Dividends are declared, or(ii) Dividends are not declared.**

(Study Material + Nov. 2021 - RTP)

SOLUTION : 22

(i) Calculation of market price per share

According to Miller - Modigliani (MM) Approach:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

Existing market price (Po) = ` 150

Expected dividend per share (D1) = ` 8

Capitalization rate (ke) = 0.10

Market price at year end (P_1) = to be determined

(a) If expected dividends are declared, then

$$₹\,150 = \frac{P_1 + ₹\,8}{1 + 0.10}$$

$$\therefore \quad P_1 = ₹\,157$$

(b) If expected dividends are not declared, then

$$₹\,150 = \frac{P_1 + 0}{1 + 0.10}$$

$$\therefore \quad P_1 = ₹\,165$$

(ii) Calculation of number of shares to be issued

	(a) Dividends are declared (`lakh)	(b) Dividends are not Declared (` lakh)
Net income	300	300
Total dividends	(80)	-
Retained earnings	220	300
Investment budget	600	600
Amount to be raised by new issues	380	300
Relevant market price (` per share)	157	165
No. of new shares to be issued (in lakh) (` 380 - 157; ` 300 - 165)	2.42	1.82

(iii) Calculation of market value of the shares

	(a) Dividends are declared	(b) Dividends are not Declared
Existing shares (in lakhs)	10.00	10.00
New shares (in lakhs)	2.42	1.82
Total shares (in lakhs)	12.42	11.82

Market price per share (`)	157	165
Total market value of shares at the end of the year (` in lakh)	12.42 x 157 = **1,950 (approx.)**	11.82 x 165 = **1,950 (approx.)**

Hence, it is proved that the total market value of shares remains unchanged irrespective of whether dividends are declared, or not declared.

*****

PROBLEM : 23

The following information relates to Navya Ltd:

Earnings of the company	**` 20,00,000**
Dividend pay-out ratio	**60%**
No. of Shares outstanding	**4,00,000**
Rate of return on investment	**15%**
Equity capitalization rate	**12%**

Required:

(i) DETERMINE what would be the market value per share as per Walter's model.

(ii) COMPUTE optimum dividend pay-out ratio according to Walter's model and the market value of company's share at that pay-out ratio.

(May 2018 – RTP + Similar Question in May 2020 – RTP + Nov. 2018 Exam – 5 Marks + July 2021 Exam – 5 Marks)

SOLUTION : 23

Navya Ltd.

(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 = '20,00,000 + 4,00,000 = ' 5
D = Dividend per share = 60% of 5 = ' 3
r = Return earned on investment = 15%
K_e = Cost of equity capital = 12%

$$\therefore P = \frac{3 + (5-3) \times \frac{0.15}{0.12}}{0.12} = \frac{3 + 2 \times \frac{0.15}{0.12}}{0.12} = ₹\ 45.83$$

(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: -

$$\frac{0 + (5-0) \times \frac{0.15}{0.12}}{0.12} = ₹\ 52.08$$

*****

PROBLEM : 24

The earnings per share of a company is ` 10 and the rate of capitalisation applicable to it is 10 per cent. The company has three options of paying dividend i.e. (i) 50%, (ii) 75% and 100%.

CALCULATE the market price of the share as per Walter's model if it can earn a return of (a) 15, (b) 10 and (c) 5 per cent on its retained earnings. **(Nov. 2018 RTP)**

SOLUTION : 24

Market Price (P) per share as per Walter's Model is:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,

P = Price of Share

r = Return on investment or rate of earning

Ke = Rate of Capitalisation or Cost of Equity

Calculation of Market Price (P) under the following dividend payout ratio and earning rates:

		(i)	(ii)	(iii)
	Rate of Earning (r)	**DP ratio 50%**	**DP ratio 75%**	**DP ratio 100%**
(a)	15%	$\frac{5+\left(\frac{0.15}{0.10}\right)(10-5)}{0.10}$ $=\frac{12.5}{0.10}=₹125$	$\frac{7.5+\left(\frac{0.15}{0.10}\right)(10-7.5)}{0.10}$ $=\frac{11.25}{0.10}=₹112.5$	$\frac{10+\left(\frac{0.15}{0.10}\right)(10-10)}{0.10}$ $=\frac{10}{0.10}=₹100$
(b)	10%	$\frac{5+\left(\frac{0.10}{0.10}\right)(10-5)}{0.10}$ $=\frac{10}{0.10}=₹100$	$\frac{7.5+\left(\frac{0.10}{0.10}\right)(10-7.5)}{0.10}$ $=\frac{10}{0.10}=₹100$	$\frac{10+\left(\frac{0.10}{0.10}\right)(10-10)}{0.10}$ $=\frac{10}{0.10}=₹100$
(c)	5%	$\frac{5+\left(\frac{0.05}{0.10}\right)(10-5)}{0.10}$ $=\frac{7.5}{0.10}=₹75$	$\frac{7.5+\left(\frac{0.05}{0.10}\right)(10-7.5)}{0.10}$ $=\frac{8.75}{0.10}=₹87.5$	$\frac{10+\left(\frac{0.05}{0.10}\right)(10-10)}{0.10}$ $=\frac{10}{0.10}=₹100$

*****

PROBLEM : 25

STATE two advantages of Walter Model of Dividend Decision. **(August 2018 – MTP – 2 Marks)**

SOLUTION : 25

Advantages of Walter Model

(1) The formula is simple to understand and easy to compute.

(2) It can envisage different possible market prices in different situations and considers internal rate of return, market capitalisation rate and dividend payout ratio in the determination of market value of shares.

*****

PROBLEM : 26

STATE the advantages of Stock-Splits. **(Oct. 2018 – MTP – 2 Marks)**

SOLUTION : 26

Various advantages of Stock Spills are as follows:

(1) It makes the share affordable to small investors.

(2) Number of shares may increase the number of shareholders; hence the potential of investment may increase.

*****

PROBLEM : 27

LIST the factors determining the dividend policy of a company. **(March 2019 – MTP – 3 Marks)**

SOLUTION : 27

Factors Determining the Dividend Policy of a Company

(i) Liquidity: In order to pay dividends, a company will require access to cash. Even very profitable

companies might sometimes have difficulty in paying dividends if resources are tied up in other forms of assets.

(ii) Repayment of debt: Dividend payout may be made difficult if debt is scheduled for repayment.

(iii) Stability of Profits: Other things being equal, a company with stable profits is more likely to pay out a higher percentage of earnings than a company with fluctuating profits.

(iv) Control: The use of retained earnings to finance new projects preserves the company's ownership and control. This can be advantageous in firms where the present disposition of shareholding is of importance.

(v) Legal consideration: The legal provisions lay down boundaries within which a company can declare dividends.

(vi) Likely effect of the declaration and quantum of dividend on market prices.

(vii) Tax considerations and

(viii) Others such as dividend policies adopted by units similarly placed in the industry, management attitude on dilution of existing control over the shares, fear of being branded as incompetent or inefficient, conservative policy Vs non-aggressive one.

(ix) Inflation: Inflation must be taken into account when a firm establishes its dividend policy.

*****

PROBLEM : 28

The following data is available in respect of N Ltd. for the year ended 31st March, 2021:

	Rs. (in Crore)
Share capital (@ Rs. 10 per share)	25.00
Reserves	15.00
Profit after tax (PAT)	3.70
Dividends paid	3.00
P/E ratio	26.70

Using Walter's Model:

(i) COMMENT on the firm's dividend policy;

(ii) DETERMINE the optimum payout ratio and

(iii) DETERMINE the P/E ratio at which dividend payout will have no effect on share price.

(April 2021 – MTP – 5 Marks)

SOLUTION : 28

Workings:

1. Earnings per share (E) $= \frac{PAT}{\text{No. of shares}} = \frac{\text{Rs. 3.7 crores}}{\text{2.5 crore shares}} = \text{Rs. } 1.48$

2. Return on Investment (r) $= \frac{PAT}{\text{Net worth}} \times 100 = \frac{\text{Rs. 3.7 crores}}{\text{Rs. (25 + 15) crores}} \times 100 = 9.25\%$

3. Dividend per share (D) $= \frac{\text{Dividend paid}}{\text{No. of shares}} = \frac{\text{Rs. 3 crores}}{\text{2.5 crore shares}} = \text{Rs. } 1.2$

   Dividend payout ratio $= \frac{\text{Dividend}}{PAT} \times 100 = \frac{\text{Rs. 3 crores}}{\text{Rs. 3.7 crores}} \times 100 = 81.08\%$

4. Current Market Price (P_o) = P/E Ratio x E = 26.7 x Rs. 1.48 = Rs. 39.52

5. Growth rate (g) = b x r = (1 - 0.8108) x 0.0925 = 1.75%

6. Cost of Capital (K_e) $= \frac{D(1+g)}{P_o} + g = \frac{\text{Rs. } 1.2\ (1 + 0.0175)}{\text{Rs. } 39.52} + 0.0175 = 4.84\%$

(i) The value of the share as per Walter's model:

$$P = \frac{D + \frac{r}{K_e}(E-D)}{K_e} = \frac{1.2 + \frac{0.0925}{0.0484}(1.48-1.2)}{0.0484} = \text{Rs. } 35.85$$

The firm has a dividend payout of 81.08% (i.e., Rs. 3 crores) out of Profit after tax of Rs. 3.7 crores with value of the share at Rs. 35.85. The rate of return on investment (r) is 9.25% and it is more than the Ke of 4.84%, therefore, by distributing 81.08% of earnings, the firm is not following an optimal dividend policy.

(ii) Under Walter's model, when return on investment is more than cost of capital (r > Ke), the market share price will be maximum if 100% retention policy is followed. So, the optimal payout ratio would be to pay zero dividend and in such a situation, the market price would be:

$$P = \frac{0 + \frac{0.0925}{0.0484}(1.48 - 0)}{0.0484} = \text{Rs. } 58.44$$

(iii) The P/E ratio at which dividend payout will have no effect on share price is at which the K_e would be equal to the rate of return (r) of the firm i.e. 9.25%.

$$\text{So, } K_e = \frac{D(1+g)}{P_0} + g$$

$$0.0925 = \frac{\text{Rs. } 1.2\,(1 + 0.0175)}{P_0} + 0.0175$$

$$\therefore P_0 = \text{Rs. } 16.28$$

If P_0 is Rs. 16.28, then, P/E Ratio will be:

$$= \frac{P_0}{E} = \frac{\text{Rs. } 16.28}{\text{Rs. } 1.48} = 11 \text{ times}$$

Therefore, at the P/E ratio of 11, the dividend payout will have no effect on share price.

*****

PROBLEM : 29

Briefly explain the assumptions of Walter's Model – (May 2022 – Exam – 4 Marks)

SOLUTION : 29

Walter's approach is based on the following assumptions:

- All investment proposals of the firm are to be financed **through retained earnings** only.
- **'r'** rate of return & **'Ke'** cost of capital are constant.
- **Perfect capital markets:** The firm operates in a market in which all investors are rational and information is freely available to all.
- **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.
- **No floatation or transaction cost:** Similarly, these costs may differ country to country or market to market.
- The firm has **perpetual life**

*****

PROBLEM : 30

Ordinary shares of a listed company are currently trading at ` 10 per share with two lakh shares outstanding. The company anticipates that its earnings for next year will be

` 5,00,000. Existing cost of capital for equity shares is 15%. The company has certain investment proposals under discussion which will cause an additional 26,089 ordinary shares to be issued if no dividend is paid or an additional 47,619 ordinary shares to be issued if dividend is paid.

Applying the MM hypothesis on dividend decisions, CALCULATE the amount of investment and

dividend that is under consideration by the company. **(Nov. 2022 - RTP)**

SOLUTION : 30

P_0 = ₹ 10 n = 2,00,000, E = ₹ 5,00,000

K_e = 15%, Δn = 26,089, I = ?

$$P_0 = \frac{P_1}{1+K_e}$$

$$10 = \frac{P_1}{1.15}$$

$\therefore P_1 = 11.5$

$$\Delta n = \frac{I-E+nD_1}{P_1}$$

$$26{,}089 = \frac{I-5{,}00{,}000}{11.5}$$

I = 8,00,024

Now,

Now,

P_0 = ₹ 10, n = ₹ 2,00,000,

E = ₹ 5,00,000, I = 8,00,024,

K_e = 15%, Δn 47,619, D_1 = ?

$$P_0 = \frac{P_1+D_1}{1+K_e}$$

$$10 = \frac{P_1+D_1}{1.15}$$

$P_1 + D_1 = 11.5$

$\therefore P_1 = 11.5 - D_1$ 1

$$\because \Delta n = \frac{I-E+nD_1}{P_1}$$

$$47{,}619 = \frac{8{,}00{,}024-5{,}00{,}000+2{,}00{,}000D_1}{P_1}$$

$\therefore$ 2,47,594.5 = 2,47,619 D_1

$$\therefore D_1 = \frac{2{,}47{,}594.5}{2{,}47{,}619} = 0.99 \approx ₹\ 1$$

$\therefore P_1 = 11.5 - D_1$

$P_1 = 11.5 - 1$

$P_1 = 10.5$

*****

PROBLEM : 31

Roma Nov Ltd. has a capital of ` 25,00,000 in equity shares of ` 100 each. The shares are currently quoted at ` 120. The company proposes to declare a dividend of `15 per share at the end of the current financial year. The capitalization rate for the risk class of which the company belongs is 15%. COMPUTE market price of the share at the end of the year, if

(i) Dividend is not declared.
(ii) Dividend is declared.

Assuming that the company pays the dividend and has net profits of ` 9,00,000 and makes new investments of ` 15,00,000 during the period, CALCULATE number of new shares to be issued? Use the MM model. (MARCH 2023 MTP - 5 Marks)

SOLUTION : 31

Given,

Cost of Equity (K_e)	15%
Number of shares in the beginning (n)	25,000
Current Market Price (P_0)	120
Net Profit (E)	9,00,000
Expected Dividend (D_1)	15
Investment (I)	15,00,000

Computation of market price per share, when:

(i) No dividend is declared:

(i) No dividend is declared:

$$Po = \frac{P_1 + D_1}{1 + k_e}$$

$$₹120 = \frac{P_1 + 0}{1 + 0.15}$$

P_1 = ₹138 – 0 = ₹ 138

(ii) Dividend is declared:

$$₹120 = \frac{P_1 + 15}{1 + 0.15}$$

P_1 = ₹138 – ₹15 = ₹ 123

Calculation of number of shares required for investment.

	`
Earnings	9,00,000
Dividend distributed	3,75,000
Fund available for investment	12,75,000
Total Investment	15,00,000
Balance Funds required	15,00,000 - 12,75,000 = 2,25,000

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$= \frac{2,25,000}{123} = 1,830 \text{ Shares(approx.)}$$

*****

PROBLEM : 32

Rex Ltd has 20 lakh equity shares outstanding at the start of the accounting year 2023. The existing market price per share is ` 300. Expected dividend is ` 20 per share. The rate of capitalization appropriate to the

risk class to which the company belongs is 20%.

CALCULATE the market price per share when expected dividends are: (a) declared, and (b) not declared, based on the Miller - Modigliani approach.

CALCULATE number of shares to be issued by the company at the end of the accounting year on the assumption that the net income for the year is ` 5 crore; investment budget is ` 8 crores, when (a) Dividends are declared, and (b) Dividends are not declared.

PROVE that the market value of the shares at the end of the accounting year will remain unchanged irrespective of whether (a) Dividends are declared, or (ii) Dividends are not declared.

WHAT is the implied growth rate in dividends as per Gordon's model, if expected dividend payment is considered imminent? **(APRIL 2023 – MTP – 10 MARKS)**

SOLUTION : 32

(i) Calculation of market price per share

According to Miller - Modigliani (MM) Approach:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

Existing market price (P_o) = ` 300

Expected dividend per share (D_1) = ` 20

Capitalization rate (k_e) = 0.20 Market price at year end (P_1) = ?

(a) If expected dividends are declared, then

$300 = (P_1 + 20)/(1 + 0.2)$

$300 \times 1.2 = P_1 + 20$

$P_1 = 340$

(b) If expected dividends are not declared, then

$300 = (P_1 + 0)/(1 + 0.2)$

$300 \times 1.2 = P_1$

$P_1 = 360$

(ii) Calculation of number of shares to be issued

	(a) **Dividends are declared (` lakh)**	(b) **Dividends are not Declared (` lakh)**
Net income	500	500
Total dividends	(400)	-
Retained earnings	100	500
Investment budget	800	800
Amount to be raised by new issues	700	300
Relevant market price (` per share)	340	360
No. of new shares to be issued (in lakh) (` 700 - 340; ` 300 - 360)	2.0588	0.8333

(iii) Calculation of market value of the shares

Particulars	**(a) Dividends are declared**	**(b) Dividends are not Declared**
Existing shares (in lakhs)	20.00	20.00
New shares (in lakhs)	2.0588	0.8333
Total shares (in lakhs)	22.0588	20.8333
Market price per share (`)	340	360
Total market value of shares at the end of the year (` in lakh)	22.0588 x 340 = 7,500 (approx.)	20.8333 x 360 = 7,500 (approx.)

Hence, it is proved that the total market value of shares remains unchanged irrespective of whether dividends are declared, or not declared.

(iv) P0=D1/(Ke-g)

300 = 20/(0.2-g)

2-g = 20/300

2-g = 0.0667

G = 0.133333

g = 13.3333%

*****

PROBLEM : 33

EXPLAIN the determinants of dividend decisions. **(APRIL 2023 – MTP – 4 MARKS)**

SOLUTION : 33

The dividend policy is affected by the following factors:

1. **Availability of funds:** If the business is in requirement of funds, then retained earnings could be a good source. The reason being the saving of floatation cost and prevention of dilution of control which happens in case of new issue of equity shares to public.
2. **Cost of capital:** If the financing requirements are to be executed through debt (relatively cheaper source of finance), then it would be preferable to distribute more dividend. On the other hand, if the financing is to be done through fresh issue of equity shares, then it is better to use retained earnings as much as possible.
3. **Capital structure:** An optimum Debt Equity ratio should also be considered for the dividend decision.
4. **Stock price:** Stock price here means market price of the shares. Generally, higher dividends increase market value of shares and low dividends decrease the value.
5. Investment opportunities in hand: The dividend decision is also affected if there are investment opportunities in hand. In that situation, the company may prefer to retain more earnings.
6. **Internal rate of return (IRR):** If the internal rate of return (IRR) is more than the cost of retained earnings (Kr), it is better to distribute the earnings as much as possible.
7. **Trend of industry:** The investors depend on some industries for their regular dividend income. Therefore, in such cases, the firms have to pay dividend in order to survive in the market.
8. **Expectation of shareholders:** The shareholders can be categorised into two categories: (i) those who invests for regular income, & (ii) those who invests for growth. Generally, the investor prefers current dividend over the future growth.
9. **Legal constraints:** Section 123 of the Companies Act, 2013 which provides for declaration of dividend sates that Dividend shall be declared or paid by a company for any financial year only:
   (a) out of the profits of the company for that year arrived at after providing for depreciation in accordance with the relevant provisions, or
   (b) out of the profits of the company for any previous financial year or years arrived at after providing for depreciation in accordance with the relevant provisions and remaining undistributed, or
   (c) out of both, or
   (d) out of money provided by the Central Government or a State Government for the payment of dividend by the company in pursuance of a guarantee given by that Government.

   It may be noted that, while computing the profits for payment of dividends any amount representing unrealised gains, notional gains or revaluation of assets and any change in carrying amount of an asset or of a liability on measurement of the asset or the liability at fair value shall be excluded.
10. **Taxation:** Before 1st April 2020, as per Section 115-O of Income Tax Act, 1961, dividend was subject to dividend distribution tax (DDT) in the hands of the company. Dividend on which DDT was paid, was to be exempted in the hands of the shareholder u/s 10(34). However, as per amendment made by the Finance Act 2020, the exemption u/s 10(34) shall not apply to dividend received on or after 1st April 2020 and the dividend income from shares held as investment shall be taxable under the head of 'Other income' at the applicable slab rate.

*****

PROBLEM : 34

Rambo Limited Has 1,00,000 equity shares outstanding for the year 2022. The current market price of the shares is ` 100 each. Company is planning to pay dividend of ` 10 per share. Required rate of return is 15%. Based on Modigliani-Miller approach, calculate the market price of the share of the company when the recommended dividend is 1) declared and 2) not declared.

How many new shares are to be issued by the company at the end of the year on the assumption that net income for the year is ` 40 Lac and the investment budget is ` 50,00,000 when dividend is declared, or dividend is not declared.

PROOF that the market value of the company at the end of the accounting year will remain same whether dividends are distributed or not distributed. **(MAY 2023 - RTP)**

SOLUTION : 34

Price, Number of Shares and Market Value

SN	Particulars	When Dividend is declared	When Dividend is Not declared
A	Market Price at the End $P_1 = P_o(1 + K_e) - D_1$	$P_1 = 100(1.15) - 10$ = 105	$P_1 = 100(1.15) - 0$ = 115
B	No. of Shares to be issued (N_1) $= \frac{(I - (E - ND_1)}{P_1}$	$= \frac{50,00,000 - [40,00,000 - 1,00,000 \times 10]}{105}$ = 19047.6190	$= \frac{50,00,000 - [40,00,000 - 0]}{115}$ = 8692.6522
C	Value of Firm $= \frac{(n + n_1)P_1 - (I-F)}{1+K_e}$	$= \frac{(1,00,000 + 19047.6190) \times 105 - (50,00,000 - 40,00,000)}{1.15}$ = 1,00,00,000	$= \frac{(1,00,000+8692.6522) \times 115 - (50,00,000 - 40,00,000)}{1.15}$ = 1,00,00,000

Note – Value of the Firm remains same in either case.

*****

PROBLEM : 35

Following information are given for a company :

Earnings per share	` 10
P/E ratio	12.5
Rate of return on investment	12%
Market price per share as per Walter's model	` 130

You are required to calculate :

(i) Dividend payout ratio.

(ii) Market price of share at optimum dividend payout ratio.

(iii) P/E ratio, at which the dividend policy will have no effect on the price of share.

(iv) Market price of share at this P/E ratio.

(v) Market price of share using Dividend growth model. **(MAY 2023 EXAM - 5 Marks)**

SOLUTION : 35

(i) The EPS of the firm is ` 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 ` 130 which may be equated with Walter Model as follows:

$$P = \frac{D + \frac{r}{ke}(E-D)}{ke} \quad or \quad P = \frac{D + \frac{12\%}{8\%}(10-D)}{8\%}$$

or [D + 1.5(10-D)]/0.08 = 130

or D+15 - 1.5D = 10.4

or -0.5D = -4.6

So, D = ` 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 = ` 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:

$$P = \frac{D + \frac{r}{ke}(E-D)}{ke} = \frac{9.2 + \frac{0.12}{0.12} - (10-9.2)}{0.12} = \text{` } 83.33$$

(v) Dividend Growth Model applying growth on dividend

K_e = 8%, r = 12%, D_0 = 9.2, b = 0.08

g = b.r

g = 0.08 x 0.12 = 0.96%

$D_1 = D_0$ (1+g) = 9.2 (1+ 0.0096) = ` 9.2883

$$P = \frac{D_1}{(ke - g)} = 9.2883/(0.08 - 0.0096) = 9.2883/0.0704 = \text{` } 131.936$$

Alternative

Alternatively, without applying growth on dividend

$$P = \frac{E(1-b)}{ke - br} = \frac{10\ (1 - 0.08)}{0.08 - (0.08 \times 0.12)} = \text{` } 130.68$$

*****

PROBLEM : 36

HM Ltd. is listed on Bombay Stock Exchange which is currently been evaluated by Mr. A on certain parameters.

Mr. A collated following information:

(a) The company generally gives a quarterly interim dividend. ` 2.5 per share is the last dividend declared.

(b) The company's sales are growing by 20% on a 5-year Compounded Annual Growth Rate (CAGR) basis, however the company expects following retention amounts against probabilities mentioned as contention is dependent upon cash requirements for the company. Rate of return is 10% generated by the company.

Situation	Prob.	Retention Ratio
A	30%	50%
B	40%	60%
C	30%	50%

(c) The current risk-free rate is 3.75% and with a beta of 1.2 company is having a risk premium of 4.25%. You are required to help Mr. A in calculating the current market price using Gordon's formula.

(Nov. 2023 - RTP)

SOLUTION : 36

Market price using Gordon's formula

$$P_0 = \frac{D_0(1+g)}{k_e - g}$$

D_0 = 2.5 x 4 = 10 per share (annual)

g = br or retention ratio x rate of return

Calculation of expected retention ratio

Situation	Prob.	Retention Ratio	Expected Retention Ratio
A	30%	50%	0.15
B	40%	60%	0.24
C	30%	50%	0.15
Total			**0.54**

g = 0.54 x 0.10 = 0.054 or 5.4%

$$P_0 = \frac{D_0(1+g)}{k_e - g}$$

$$P_0 = \frac{10\ (1 + 0.054)}{0885 - 0.054} = \frac{10.54}{0.0345} = 305.51$$

K_e = Risk free rate + (Beta x Risk Premium)

= 3.75% + (1.2 x 4.25%) = 8.85%

*****

PROBLEM : 37

(i) EPS of a company is ` 60 and Dividend payout ratio is 60%. Multiplier is 5. Determine price per share as per Graham & Dodd model. **(Nov. 2023 Exam - 2 Marks)**

(ii) Last year's dividend is ` 6.34, adjustment factor is 45%, target payout ratio is 60% and current year's EPS is ` 12. Compute current year's dividend using Linter's model. **(Nov. 2023 Exam - 3 Marks)**

SOLUTION : 37

(i) 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) $D_1 = D_o$ + [(EPS ×Target payout) - D_o] × Adjustment factor D_1 = 6.34 + [(12 × 60%) – 6.34] × 0.45

D_1 = 6.34 + 0.387 = ` 6.727

*****

PROBLEM : 38

INFO Ltd is a listed company having share capital of ` 2400 Crores of ` 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%, then what should be the optimum dividend payout ratio in case of growing stage of company? Comment.

(Nov. 2023 Exam - 5 Marks)

SOLUTION : 38

(a) In the present situation, the current MPS is as follows:

$$P = \frac{D_0(1+g)}{K_e - g}$$

Where

P = Market price per share D0 = current year dividend

g = growth rate of dividends

Ke = cost of equity capital/ expected rate of return

$$P = \frac{50(1+0.14)}{0.18-0.14} = ₹\ 1425$$

(b) The impact of changes in growth rate to 10% on MPS will be as follows:

$$P = \frac{50(1+0.10)}{0.18-0.10} = ₹\ 687.5$$

(c) If Internal rate of return, r = 25% and Ke = 18%

As per Gordon's model, when r > Ke, optimum dividend payout ratio is 'Zero'. When IRR is greater than cost of capital, the price per share increases and dividend pay- out decreases.

PROBLEM : 39

SOC Ltd has 10 lakh equity shares outstanding at the beginning of the accounting year 2024. The existing market price per share is Rs 600. Expected dividend is Rs 40 per share. The rate of capitalization appropriate to the risk class to which the company belongs is 20%.

(i) CALCULATE the market price per share by the end of the year when expected dividends are: (a) declared, and (b) not declared, based on the Miller–Modigliani approach.

(ii) CALCULATE the number of shares to be issued by the company at the end of the accounting year on the assumption that the net income for the year is Rs 15 crore; investment budget is Rs 20 crores, when (a) Dividends are declared, and (b) Dividends are not declared.

(iii) PROVE that the market value of the shares at the end of the accounting year will remain unchanged irrespective of whether (a) Dividends are declared, or (ii) Dividends are not declared.

(April 2024 MTP - 5 Marks)

SOLUTION : 39

(i) Calculation of market price per share

According to Miller – Modigliani (MM) Approach:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

Existing market price (Po) = Rs 600

Expected dividend per share (D1) = Rs 40

Capitalization rate (ke) =0.20

Market price at year end (P1) =?

a. If expected dividends are declared, then

600 = (P1 + 40)/(1 + 0.2)

600 x 1.2 = P1 + 40

P1 = 680

b. If expected dividends are not declared, then

600 = (P1+0)/(1+0.2)

600 x 1.2 = P1

P1 = 720

(ii) Calculation of number of shares to be issued

	(a)	(b)
	Dividends are Declared (Rs lakh)	**Dividends are not Declared (Rs lakh)**
Net income	1500	1500
Total dividends	(400)	-
Retained earnings	1100	1500
Investment budget	2000	2000
Amount to be raised by new issues	900	500
Relevant market price (Rs per share)	680	720
No. of new shares to be issued (in lakh) (Rs 900 ÷ 680; Rs 500 ÷ 720)	1.3235	0.6944

(iii) Calculation of market value of the shares

	(a)	(b)
Particulars	**Dividends are declared**	**Dividends are not Declared**
Existing shares (in lakhs)	10.00	10.00
New shares (in lakhs)	1.3235	0.6944
Total shares (in lakhs)	11.3235	10.6944
Market price per share (Rs)	680	720
Total market value of shares at the end of the year (Rs in lakh)	11.3235 × 680 = 7,700(approx.)	10.6944 × 720 z= 7,700(approx.)

Hence, it is proved that the total market value of shares remains unchanged irrespective of whether dividends are declared, or not declared.

*****

PROBLEM : 40

MCO Ltd. has a paid-up share capital of` 10,00,000, face value of` 10 each. The current market price of the shares is `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 `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` 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:

1. **It does not pay dividend and**
2. **It does pay dividend** **(May 2024 RTP)**

SOLUTION : 40

As per MM-Hypothesis, value of firm/company is calculated as below:

$$Vf \text{ or } nP_0 = \frac{(n+\Delta n)P_1 - I + E}{(1+K_e)}$$

Where,

Vf = 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.

$$nP_o = \frac{(n+\Delta n)P_1 - I + E}{1+K_e}$$

$$nP_0 = \frac{\left(1,00,000 + \frac{2,30,000}{23}\right) \times ₹23 - ₹7,50,000 + ₹5,20,000}{(1+0.15)}$$

$$= \frac{₹25,30,000 - ₹7,50,000 + ₹5,20,000}{(1+0.15)} = ₹20,00,000$$

Working notes:

1. Price of share at the end of the period(P1)

$$P_o = \frac{P_1 + D_1}{1+K_e}$$

$$20 = \frac{P_1 + 0}{1+0.15} \quad \text{or,} \quad P_1 = ₹\ 23$$

2. Calculation of funds required for investment

Earnings	\`5,20,000
Dividend distributed	Nil
Fund available for investment	\`5,20,000
Total Investment	\`7,50,000
Balance Funds required	\`2,30,000

3. Calculation of no. of shares required to be issued for balance fund

$$\text{No. of shares } (\Delta n) = \frac{\text{Funds required}}{\text{Price at end}(P_1)} = \frac{2,30,000}{23} \text{ shares}$$

$$= 10,000 \text{ shares}$$

(ii) Value of the ZX Ltd. when dividends are paid.

$$nP_o = \frac{(n+\Delta n)P_1 - I + E}{1+K_e}$$

$$nP_0 = \frac{\left(1,00,000 + \frac{4,80,000}{20.5}\right) \times ₹\ 20.5 - ₹\ 7,50,000 + ₹\ 5,20,000}{(1+0.15)}$$

$$= \frac{₹25,30,000 - ₹7,50,000 + ₹5,20,000}{(1+0.15)} = ₹20,00,000$$