

# 8

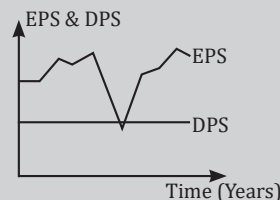
## CHAPTER

# Dividend Decisions

THEORY	
Meaning of dividend	Dividend is the amount which is distributed by the company among shareholders out the profits generated from the business after paying taxes on such profits.
Meaning of Dividend Decisions	It involves the dilemma to choose between how much amount to distributed as dividend and how much should be retained for future growth.
Factors for determining dividend policy	<p>An optimum dividend policy should be developed which divides the net earnings into dividend and retained earnings so as to achieve the objective of wealth maximization for shareholders. The various factors to be considered for dividend policy are:</p> <ul style="list-style-type: none"> <li>❑ <b>Financing Decision</b> – The equity portion of finance required for making various investments can be raised either from external equity i.e. issue of equity shares or can be generated internally through retained earnings. This decision is based on following two parameters: <ul style="list-style-type: none"> <li>○ Availability of Projects</li> <li>○ Return on Investment</li> </ul> </li> <li>❑ <b>Wealth Maximization Decision</b> – The firm has to make a choice of paying dividend or retaining it as it will decide the market price of the share which in turn affects the wealth of the shareholders. Following points are to be considered for this option: <ul style="list-style-type: none"> <li>○ Balance between dividend and retention</li> <li>○ Retained earnings affect current and future dividends</li> </ul> </li> </ul>
Determinants of Dividend Decisions	<ul style="list-style-type: none"> <li>❑ Availability of investment opportunities</li> <li>❑ Capital structure</li> <li>❑ Cost of capital</li> <li>❑ Internal rate of return</li> <li>❑ Stock price</li> <li>❑ Expectation of shareholders</li> <li>❑ Trend of industry</li> <li>❑ Liquidity</li> <li>❑ Earning stability</li> </ul>

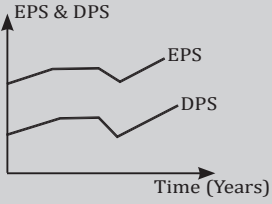
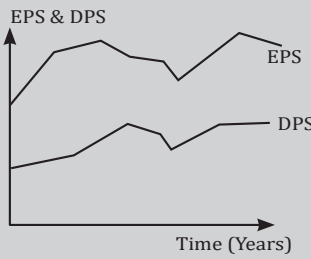
Forms of Dividend	<ul style="list-style-type: none"> <li>❑ <b>Cash Dividend</b> <ul style="list-style-type: none"> <li>○ It is the amount paid to shareholders out of current earnings or accumulated profits.</li> <li>○ It can be paid in the form of cheque, warrant, demand draft, pay order or directly through Electronic Clearing Services (ECS) but not in kind.</li> </ul> </li> <li>❑ <b>Shares repurchase</b> <ul style="list-style-type: none"> <li>○ It means buy-back of own shares of the company.</li> <li>○ It can be either as treasury shares which are kept for re-issuance or as cancelled shares.</li> <li>○ In case of cancellation it will decrease the existing number of shares.</li> <li>○ Buyback can be done either through open market or through tender offer.</li> </ul> </li> <li>❑ <b>Bonus Shares (Stock Dividend)</b> – These are the shares issued either in lieu or in addition of cash dividend to the existing shareholders proportionately as per their ownership. Through this bonus issue, reserve &amp; surplus gets converted to equity capital. Thus, there is no change on the net worth of the company.</li> </ul>
Advantages of Bonus Shares (Stock Dividend)	<ul style="list-style-type: none"> <li>❑ It signifies a bright future of the company</li> <li>❑ It utilizes profits of the company and conserve cash for meeting profitable investment projects</li> <li>❑ There is no liability of dividend distribution tax on bonus shares</li> <li>❑ It leads to increase in future cash dividend of the shareholders</li> </ul>
Limitations of Bonus Shares (Stock Dividend)	<ul style="list-style-type: none"> <li>❑ Bonus shares has no impact on the wealth of shareholders. It is merely a capitalization of past earnings of the shareholders.</li> <li>❑ It is costlier to administer bonus issue than paying cash dividends.</li> <li>❑ It may lead to over capitalization if ROI is not maintained</li> </ul>
Practical Considerations in Dividend Policy	<ul style="list-style-type: none"> <li>❑ <b>Financial needs of the company</b> – If the rate of return from the investment is less than the return that would be generated by shareholders if they invest themselves than maximum amount of profits should be distributed as dividend and vice versa. Further, raising of funds through debt and fresh equity will lead to incurrence of flotation cost and may increase the overall cost of capital of the company as well.</li> <li>❑ <b>Constraints on paying dividend</b> – These are as follows: <ul style="list-style-type: none"> <li>○ <b>Legal Constraints</b> - As per this section 123 of the Companies Act 2013, dividend shall be declared or paid by a company for any financial year only: <ul style="list-style-type: none"> <li>➤ Out of the profits of the company for that year arrived at after providing for depreciation in accordance with the provisions of section 123(2), or</li> </ul> </li> </ul> </li> </ul>

- Out of the profits of the company for any previous financial year or years arrived at after providing for depreciation in accordance with the provisions of that sub-section and remaining undistributed, or
- Out of both, or
- 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.
- **Liquidity** - The payment of dividend results in outflow of cash. It is possible that income of the company is adequate but it does not have necessary cash to pay dividend. Better the cash position of company, better will be its ability to pay dividend.
- **Access to Capital Market** – If a company's ability to make a new issue of shares or to issue debt is restricted, the company will retain a higher proportion of its profits than a company which has ready access to funds from the capital market.
- **Investment opportunities** – If the company doesn't have profitable investments, then earnings can be paid out in dividends and vice versa.
- **Desire of Shareholders** – Generally, small shareholder and senior citizen or old age shareholders desire receipt of regular dividend income while other shareholders desire to get maximum through capital appreciation instead of dividend.
- **Stability of Dividends** - Under this policy, Management tries to give dividend regularly at a stable rate. In other words, it means payment of at least some dividend regularly. Shareholders also rank it as a better policy as compared to variable dividend policy. The various types of dividend policy are:
  - **Constant Dividend per Share** - Under this policy, the company pays the same amount of dividend every year, irrespective of the fluctuation in earnings. In the years of higher earnings, the surplus is transferred to Dividend Equalization Reserve, so that constant dividends per share can be paid when the company is earning lower profits.



- **Constant Dividend Payout Ratio** – Under this policy, the company plans to pay a fixed rate of its earnings as dividends. If there are losses in any year the dividend is not paid. The ratio of dividends to earnings is known as dividend payout ratio.

$$\text{Dividend payout ratio} = \frac{DPS}{EPS}$$

	 <p>○ <b>Small constant dividend per share plus extra dividend</b> - Under this policy, the company decides to pay constant dividends per share every year. The constant dividends per share are fixed at a conservative figure so that dividends can be maintained even in periods of loss. Apart from that the company will pay extra dividends if the earnings increase beyond the stated level. The extra amount of dividend depends upon the extra amount of earnings beyond the stated level.</p> 
<b>Modigliani and Miller (MM) Hypothesis of dividend theory</b>	<p><b>Assumptions of MM Hypothesis</b></p> <ul style="list-style-type: none"> <li>❑ The capital markets operate in perfect market conditions</li> <li>❑ Freely information is available to all investors</li> <li>❑ Securities are infinitely divisible</li> <li>❑ There are no flotation costs</li> <li>❑ There are not taxes i.e. neither on dividend nor on capital gain</li> <li>❑ Investors are rational and well informed about the risk and return of all the securities</li> <li>❑ The company has a fixed investment policy</li> <li>❑ Cost of equity remains constant</li> </ul> <p><b>Explanation of MM Hypothesis</b></p> <ul style="list-style-type: none"> <li>❑ According to MM theory, earnings are the sole criteria on which market value of the firm is determined. Market value is not influenced by the split of earnings between dividends and retained earnings.</li> <li>❑ The underlying intuition for this theory is simple – Company that pay more dividends offer less price appreciation but provide the same total return to shareholders, given the risk characteristics of the company. The investors should be indifferent of receiving their returns in the form of current dividends or in the form of price increase in the market.</li> <li>❑ This can be computed with the help of following formula: <math display="block">P_0 = \frac{P_1 + D_1}{1 + K_e}</math> <p>Where, <math>P_0</math> = Market price of share today</p> </li> </ul>

	<p> <math>P1</math> = Market price of share at the end of year 1  <math>D1</math> = Dividend per share at the end of year 1  <math>Ke</math> = Cost of equity share capital or discount rate or rate of capitalization  Additional number of shares to be issued at the end of year 1  <math display="block">= \frac{I1 - (E - D)}{P1}</math> Where, <math>I1</math> = Amount required for investment  <math>E</math> = Total earnings of the company  <math>D</math> = Total dividend to be distributed  <math>P1</math> = Market price of share at the end of year 1  Market capitalization of equity shares = No. of equity shares <math>\times</math> MPS  <b>Advantages of MM Hypothesis</b> <ul style="list-style-type: none"> <li>❑ This model is logically consistent</li> <li>❑ It provides a satisfactory framework on dividend policy with the concept of arbitrage process.</li> </ul> <b>Limitations of MM Hypothesis</b> <ul style="list-style-type: none"> <li>❑ This model may not be valid under uncertainty</li> <li>❑ Validity of various assumptions is questionable</li> <li>❑ The arbitrage process is affected by the transaction cost</li> </ul> </p>
<b>Walter Model of dividend theory</b>	<p> <b>Assumptions of Walter Model</b> <ul style="list-style-type: none"> <li>❑ The firm has infinite life</li> <li>❑ All investments proposals of the firm are to be financed through retained earnings only</li> <li>❑ The business risk complexion of the firm remains same. In other words, the rate of return on investment i.e. 'r' and the cost of capital of the firm i.e. 'Ke' are constant</li> <li>❑ The firm operates in perfect capital market i.e. all investors are rational and information is freely available.</li> <li>❑ There are no taxes</li> <li>❑ There is no flotation or transaction costs</li> </ul> <b>Explanation of Walter Model</b>  As per this model, a company should or should not pay dividends depends upon whether it has got the suitable investment opportunities to invest the retained earnings or not.  The relationship between dividend and share price based on Walter's formula is shown below:  <math display="block">\text{Market Price (P0)} = \frac{D + (E - D)(r / Ke)}{Ke}</math> Where, <math>P0</math> = Market price of equity share  <math>E</math> = Earnings per share  <math>D</math> = Dividend per share </p>

	$K_e$ = Cost of equity or rate of capitalization or discount rate $r$ = Rate of return on investment or internal rate or return		
	<b>Position of <math>r</math> and <math>K_e</math></b>	<b>Company</b>	<b>Optimum Dividend Payout Ratio</b>
	$r > K_e$	Growth	Zero
	$r < K_e$	Decline	100%
	$r = K_e$	Constant	Every payout ratio is optimum
	<b>Advantages of Walter Model</b> <ul style="list-style-type: none"> <li>□ The formula is simple to understand and easy to compute</li> <li>□ It can envisage different possible market prices in different situations and considers internal rate of return, market capitalization rate and dividend payout ratio in the determination of market value of shares.</li> </ul> <b>Limitations of Walter Model</b> <ul style="list-style-type: none"> <li>□ The formula does not consider all the factors affecting dividend policy and share prices. Moreover, determination of market capitalization rate is difficult.</li> <li>□ Further, the formula ignores such factors as taxation, various legal and contractual obligations, management policy and attitude towards dividend policy and so on.</li> <li>□ This model is based on the assumption that '<math>r</math>' is constant.</li> <li>□ This model assumes that '<math>K_e</math>' remains same, which abstracts from the effect of risk on the value of the company.</li> <li>□ The model doesn't consider the external options i.e. debt and equity for financing the investment opportunities in the company.</li> </ul>		
<b>Dividend Discount Model of dividend theory</b>	<p>Dividend discount model calculates the theoretical market value of the share by discounting the all future expected cash flows using an appropriate risk-adjusted rate. The security with a greater risk must potentially pay a greater rate of return to induce investors to buy the security. The dividend discount model is the intrinsic value of the stock. Future cash flows include dividends and the sale price of the stock when it is sold.</p> <p>There are three models used in the dividend discount model:</p> <p>(a) Zero-growth model  (b) Constant-growth model  (c) Variable-growth model</p>		
<b>Zero Growth Model</b>	<p>This model assumes that all dividends paid by a stock remain the same. The stock price will be equal to the annual dividends divided by the required rate of return.</p> $\text{Stock's Intrinsic Value (P}_0\text{)} = \frac{\text{Annual Dividend}}{\text{Require Rate of Return}} = \frac{D}{K_e}$		

### Assumptions of Gordon Model

- ❑ The firm is an all equity firm i.e. it has no debt
- ❑ All investment proposals of the firm are to be financed through retained earnings only and no external finance is available to the company.
- ❑ The business risk complexion of the firm remains same. In other words, rate of return on investment i.e. ' $r$ ' and cost of capital of the company i.e. ' $Ke$ ' are constant.
- ❑ The firm has an infinite life
- ❑ The cost of capital besides being constant is more than the growth rate i.e.  $Ke > g$
- ❑ The growth rate of the company ' $g$ ' is the product of its retention ratio ' $b$ ' and its rate of return ' $r$ ' i.e.  $g = br$

### Explanation of model

This model suggests that, investors prefer what is available at present compared to what may be available in future. Investors are certain of receiving incomes from dividends than from future capital gains. Investors will prefer to pay a higher price for shares on which current dividends are paid as compared to those shares on which future capital gains are expected.

**Under this model, market price of share can be calculated as follows:**

$$\text{Market Price (P}_0\text{)} = \frac{D_1}{Ke - g} = \frac{D_0(1 + Ke)}{Ke - g}$$

Where,  $D_1$  = Next expected dividends or dividends payable at the end of the year

$D_0$  = current year Dividend

$Ke$  = cost of Equity capital or expected rate of return

$G$  = growth rate of dividends =  $br$

### Advantages of Gordon Model

- ❑ The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows.
- ❑ There is no ambiguity regarding the definitions of dividends.
- ❑ Dividends tend to stay consistent over long period of time
- ❑ This model is easy to understand

### Limitations of Gordon Model

- ❑ 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.
- ❑ The true intrinsic value of a stock is unknowable
- ❑ The model is only applicable to mature, stable companies
- ❑ The dividend discount model assumes that the dividends paid out are correlated to earnings. But, in practice companies strive to maintain stable dividend payouts, even if they are facing extreme variations in their earnings.
- ❑ This model is not applicable to large shareholders.



<b>Variable-Growth Model or Multi Stage Growth Model</b>	<ul style="list-style-type: none"> <li>❑ This model can take many forms, even assuming the growth rate is different for every year.</li> <li>❑ 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.</li> <li>❑ The present values of each stage are added together to derive the intrinsic value of the stock.</li> <li>❑ Sometimes, even the capitalization rate, or the required rate of return, may be varied if changes in the rate are projected.</li> </ul> <p>Stock Intrinsic Value (<math>P_0</math>) = PV of dividends + PV of market price at the end of the period</p>
<b>Traditional Model or Graham &amp; Dodd Model of dividend theory</b>	<p>According to the traditional model, the stock market places considerably more weight on dividends than on retained earnings. For them, the stock market is overwhelmingly in favor of liberal dividends as against niggardly dividends. Their view is expressed quantitatively in the following valuation model:</p> <p style="padding-left: 40px;">Market Price (<math>P</math>) = <math>m (D + E/3)</math></p> <p style="padding-left: 40px;">Where, <math>P</math> = Market Price per share</p> <p style="padding-left: 80px;"><math>D</math> = Dividend per share</p> <p style="padding-left: 80px;"><math>E</math> = Earnings per share</p> <p style="padding-left: 80px;"><math>M</math> = Multiplier</p>
<b>Linter's Model of Dividend Theory</b>	<p><b>Assumptions of Linter's Model</b></p> <ul style="list-style-type: none"> <li>❑ Firms 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.</li> <li>❑ 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.</li> <li>❑ Dividend changes follow changes in long run sustainable earnings.</li> <li>❑ Managers are reluctant to affect dividend changes that may have to be reversed.</li> </ul> <p><b>Explanation of Linter's Model</b></p> <p>This model states that, the current year's dividend is dependent on current year's earnings and last year's dividends. Similarly, last year's dividends are based on last year's earnings and the second previous year's dividends. If the circumstances appeared to warrant a large increase in their company's dividend then the firm would move only steadily towards their target payment. Conservative firms move slowly towards their target and hence would have a low adjustment rate.</p>



	$D1 = D0 + [(EPS \times \text{Target payout}) - D0] \times Af$ <p>Where, <math>D1</math> = Dividend in year 1 or next expected dividend  <math>D0</math> = Last year dividend  <math>EPS</math> = Earnings per share  <math>Af</math> = Adjustment factor</p> <p><b>Criticism of Linter's Model</b></p> <ul style="list-style-type: none"> <li>❑ This model does not offer a market price for the shares</li> <li>❑ The adjustment factor is an arbitrary number and not based on any scientific criterion or methods.</li> </ul>
<b>Stock Split</b>	<ul style="list-style-type: none"> <li>❑ Stock split is a corporate action in which a company divides its existing shares into multiple shares, means splitting one share into many shares.</li> <li>❑ For example, ₹300 share into 3 shares of ₹100 each.</li> <li>❑ Stock split is a tool used by companies to regulate the price of shares i.e. if a share price increases beyond a limit, it may become less tradable.</li> <li>❑ For example, suppose a company's share price increases from ₹25 to ₹900 over the years, it is possible that it might go out of range of many investors.</li> </ul> <p><b>Advantages of Stock Split</b></p> <ul style="list-style-type: none"> <li>❑ Affordability of each share is improved</li> <li>❑ More shares are available so have a wider ownership base</li> <li>❑ Certain investors prefer stocks that keep splitting</li> </ul> <p><b>Disadvantages of Stock Split</b></p> <ul style="list-style-type: none"> <li>❑ Additional expenditure needs to be incurred on the process of stock split.</li> <li>❑ Low share price may attract speculators or short-term investors, which are generally not preferred by any company</li> <li>❑ If a company splits its stock and then the value of the company itself falls, the shares may fall below the requirement and be delisted from the exchange.</li> </ul>

## PRACTICAL QUESTIONS

1. SK Ltd. earns ₹10 per 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.

[Sol. 0%; ₹120]

2. Following are the details regarding three companies S Ltd., K Ltd. and M Ltd.:

S Ltd.	K Ltd.	M Ltd.
$r = 15\%$	$r = 5\%$	$r = 10\%$
$Ke = 10\%$	$Ke = 10\%$	$Ke = 10\%$
$E = ₹8$	$E = ₹8$	$E = ₹8$

Calculate the value of an equity share of each of these companies applying Walter's formula when dividend payment ratio ( $D/P$  ratio) is: (a) 25%, (b) 50%, (c) 75%. What conclusion do you draw?

[Sol. (a) ₹110; ₹50; ₹80; (b) ₹100; ₹60; ₹80; (c) ₹90; ₹70; ₹80]

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

Net Profit	₹30 lakhs
Outstanding 12% Preference Shares	₹100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of Capital ( $Ke$ )	16%

Compute the approximate dividend pay-out ratio so as to keep the share price at ₹42 using Walter's model?

[SM, Similar Nov 2020]

[Sol. 52%]

4. The following information pertains to M/s SK Ltd.:

Earnings of the company	₹5,00,000
Dividend pay-out ratio	60%
No. of shares outstanding	1,00,000
Equity capitalization rate	12%
Rate of return on investment	15%

### Calculate

- (a) What would be the market value per share as per Walter's Model?  
 (b) What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?

[SM, Similar July 2021]

[Sol. (a) ₹45.83; (b) ₹52.08]

5. The following information is available to you:

[SM, RTP May 2021]

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:

- (a) Analyse whether the company is following an optimal dividend policy.
- (b) Compute P/E Ratio at which the dividend policy will have no effect on the value of the share.
- (c) Will your decision change, if the P/E ratio is 8 instead of 12.5? Analyze.

[Sol. (a) No; (b) 10 times; (c) Price at optimal level = ₹80]

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

Net Profit	₹30 lakhs
Outstanding 12% Preference Shares	₹100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of Capital (Ke)	16%

Calculate price per share using Gordon's Model when dividend payout ratio is (i) 25%; (ii) 50% and (iii) 100%.

[Sol. (i) ₹150; (ii) ₹50; (iii) ₹37.50]

7. SK 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?

[Sol. ₹50]

8. SK Ltd. 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.

[Sol. ₹15.69]

9. A firm had paid dividend at ₹2 per share last year. The estimated growth rate of the dividends from the company is estimated to be at 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%.

[Sol. Present price = ₹21; (i) ₹30.86; (ii) ₹17.17]

10. A company has equity shares of ₹100 each. The company has paid dividend of ₹30 last year. The company is expected to grow at 12% p.a. for next two years, at 9% p.a. for next three years and by 5% p.a. for thereafter. The present price of share is ₹1,500 per share.

Find the intrinsic value of share if expected rate of return is 8% p.a. Also, state whether share is under-priced or over-priced.

[Sol. ₹1,323.54]

11. SK Ltd. expects with some degree of certainty to generate the following profits and to have the following capital investment during the next five years.

Year	1	2	3	4	5
Net Income	100,00,000	80,00,000	50,00,000	40,00,000	30,00,000
Investment	40,00,000	50,00,000	64,00,000	80,00,000	100,00,000

The company currently has 20,00,000 shares of equity and pays dividend of ₹10 per share. The company plans to finance their investment with debt and equity in the ratio of 1:1.

- (a) Determine dividends per share if dividend policy is treated as a residual decision.
- (b) Determine dividends per share under the fixed dividend payout ratio approach
- (c) Determine dividends per share if a dividend payout ratio of 50% is maintained.

[Sol. (a) ₹4; ₹2.75; ₹0.90; -; -; (b) ₹2.2165; ₹1.77; ₹1.10825; ₹0.8866; ₹0.6645; (c) ₹2.50; ₹2.00; ₹1.25; ₹1.00; ₹0.75]

- 12.** SK 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

- (a) Dividend is not declared?
- (b) Dividend is declared?
- (c) 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, how many new shares must be issued? Use the MM Model.

[Sol. (a) ₹112; (b) ₹102; (c) 5,883 shares]

- 13.** 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 26,809 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. **[RTP Nov 2022]**

[Sol. Investment = ₹8,00,024; Dividend per share = ₹1]

- 14.** 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.

[Sol. ₹56]

- 15.** The following information regarding the equity shares of SK Ltd. is given below:

Market price	₹58.33
Dividend per shares	₹5
Multiplier	7

According to the Graham & Dodd approach to the dividend policy, compute the EPS.

[Sol. ₹10]

- 16.** The dividend payout ratio of SK Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, compute P/E Ratio.

[Sol. 6.60]

- 17.** Given the last year's dividend is ₹9.80, speed of adjustment = 45%, target payout ratio 60% and EPS for current year ₹20. Compute current year's dividend using Linter's model.

[Sol. ₹10.79]

18. Mr. S is currently holding 1,00,000 shares of SK Ltd. and currently the shares of SK Ltd is trading on NSE at ₹50 per share. Mr. S have a policy to re-invest the amount of any dividend received into the shares back again of SK Ltd. If SK Ltd. has declared a dividend of ₹10 per share, please determine the number of shares that Mr. S would hold after he re-invests dividend in shares of SK Ltd.

[Sol. 1,25,000 shares]

19. Following information is given pertaining to SK Ltd.

Number of shares outstanding	1 lakh shares
Earnings per share	₹25 per share
PE Ratio	20
Book value per share	₹400 per share

If company decides to repurchase 5,000 shares, at the prevailing market price, what is the resulting book value per share after repurchasing.

[Sol. ₹367]

20. SK Ltd which has 2 Crore Shares of ₹10 each outstanding, has earned ₹200 per Share for the year ending 31st March. All the Shares are held by small shareholders, and no single person holds more than 5 Lakh Shares. Its Dividend Policy stipulates a payout of 30% (including Dividend Distribution Tax) when EPS is above ₹100. Company is in the 34% Tax Bracket. Assume a Dividend Distribution Tax of 16% of dividends distributed. The Average Personal Tax Rate applicable for individuals is 25%.

The Company wants to know if it is beneficial to Investors to distribute the dividend now or postpone it by 3 years, if risk free Bank Deposits carry an interest rate of 9% p.a. for 3 year deposits. For Bulk Deposits of ₹ 5 Crore and more, Bank Deposits carry an interest rate of 11% p.a.

[Sol. Net amount to investor – now = ₹12,584.24 lakhs; after 3 years = ₹12,765.47 lakhs]

## PRACTICE QUESTIONS

21. The annual report of SK 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. (Ke)	16%

Calculate price per share using Gordon Model when dividend pay-out ratio is:

- (a) 25%                      (b) 50%                      (c) 100%

[Sol. (a) ₹175; (b) ₹58.33; (c) ₹43.75]

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

- (a) 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?
- (b) It is expected that SK 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?

[Sol. (a) 8.97%; (b) Ke = 8.19%]

23. Following information relating to Jee Ltd. are given:

Particulars	
Profit after tax	₹10,00,000
Dividend payout ratio	50%
Number of equity shares	50,000
Cost of equity	10%
Rate of return on investment	12%

- (a) What would be the market value per share as per Walter's Model?  
 (b) What is the optimum dividend payout ratio according to Walter's Model and Market value of equity share at that payout ratio?  
**[Nov 2018, RTP May 2020]**

**[Sol. (a) ₹220; (b) ₹240]**

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

Earning per share	₹60
Capitalisation rate	15%
Return on investment	25%
Dividend payout ratio	30%

- (a) Compute price per share using Walter's Model  
 (b) What would be the optimum dividend payout ratio per share under Gordon's Model.

**[Sol. (a) ₹586.67; (b) zero]**

25. Following information are given for a company

Earnings per share	₹10
PE Ratio	12.5
Rate of return on investment	12%
Market price per share as per Walter's Model	₹130

You are required to calculate:

- (a) Dividend payout ratio  
 (b) Market price of share at optimum dividend payout ratio  
 (c) PE Ratio at which the dividend policy will have no effect on the price of share  
 (d) Market price of share at this PE ratio  
 (e) Market price of share using Dividend growth model  
**[May 2023]**

**[Sol. (a) 92%; (b) ₹187.50; (c) 8.33; (d) ₹83.33; (e) 131.936]**

26. Following figures and information were extracted from the company A Ltd.

[Nov 2019]

Earnings of the company	₹10,00,000
Dividend paid	₹6,00,000
No. of shares outstanding	2,00,000
Price Earnings Ratio	10
Rate of return on investment	20%

You are required to calculate:

- Current market price of the share
- Capitalization rate of its risk class
- What should be the optimum pay-out ratio
- What should be the market price per share at optimal pay-out ratio? (Use Walter's Model)

[Sol. (a) ₹70; (b) 10%; (c) zero; (d) ₹100]

27. With the help of following figures calculate the market price of a share of a company by using:

- Walter's model
- Dividend growth model (Gordon's formula)

Earning per share (EPS)	₹10
Dividend per share (DPS)	₹6
Cost of capital (Ke)	20%
Internal rate of return on investment	25%
Retention ratio	40%

[Sol. (a) ₹55; (b) ₹60]

28. The following information is taken from ABC Ltd.

[Jan 2021]

Net profit for the year	₹30,00,000
12% Preference share capital	₹1,00,00,000
Equity share capital (Share of ₹10 each)	₹60,00,000
Internal rate of return on investment	22%
Cost of equity capital	18%
Retention ratio	75%

Calculate the market price of the share using:

- Gordon's Model
- Walter's Model

[Sol. (a) ₹50; (b) ₹19.44]

29. HM Ltd. is listed on Bombay Stock Exchange which is currently been evaluated by Mr. A on certain parameters. Mr. A collated following information:

[RTP Nov 2023]

- The company generally gives a quarterly interim dividend ₹2.5 per share in 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.

[Sol. ₹305.51]

30. SK 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 infinite 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 per share and state whether shares are overpriced or under-priced.

[Sol. ₹1,140.14]

31. X Ltd. is a multinational company. Current market price per share is ₹2,185. During the FY 2020-21, the company paid ₹140 as dividend per share. The company is expected to grow @12% p.a. for next four years, then 5% p.a. for an indefinite period. Expected rate of return of shareholders is 18% p.a.

[Dec 2021]

- (i) Find out intrinsic value per share.  
(ii) State whether shares are overpriced or underpriced.

Year	1	2	3	4	5
Discounting factor @18%	0.847	0.718	0.608	0.515	0.436

[Sol. (i) ₹1,779.27; (ii) overpriced]

32. SK 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 per 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 firms when dividends (i) are not paid; (ii) are paid.

[Sol. (i) ₹10,00,000; (ii) ₹10,00,000]

33. SK Ltd. belongs to a risk class for which the capitalization rate is 10%. It has 25,000 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.

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

[Sol. ]

34. SK Ltd. has 10 lakh equity shares outstanding at the start of the accounting year. 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%. **[SM, RTP Dec 2021]**

- (a) Calculate the market price per share when expected dividends are: (i) declared, and (ii) not declared, based on the Miller-Modigliani approach.
- (b) 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 ₹3 crore, investment budget is ₹6 crores when (i) dividends are declared, and (ii) dividends are not declared.
- (c) Proof that the market value of the shares at the end of the accounting year will remain unchanged irrespective of whether (i) dividends are declared, or (ii) dividends are not declared.

[Sol. (a) (i) ₹105; (ii) ₹110; (b); (i) 3,571.4285; (ii) 2,272.73]

## SOLUTIONS

21. 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:

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

$$E_1 = 7, K_e = 16\%$$

(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%

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

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

$$K_e = \frac{D_1}{P_0} + g = \frac{20(1+0.075)}{1,460} + 7.5\% = 0.0147 + 0.075 = 0.0897 \text{ or } 8.97\%$$

- (ii) With rate of return on retained earnings ( $r$ ) is 10% and retention ratio ( $b$ ) is 60%, new growth rate will be as follows:

$$g = br = 0.10 \times 0.60 = 0.06$$

Accordingly, dividend will also get changed and to calculate this, first we shall calculate previous retention ratio ( $b_1$ ) 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:

$$0.075 = b_1 \times 0.10$$

$$b_1 = 0.75 \text{ and payout ratio} = 0.25$$

With 0.25 payout ratio the  $EPS$  will be as follows:

$$\frac{\text{₹}20}{0.25} = \text{₹}80$$

With new 0.040 ( $1 - 0.60$ ) payout ratio, the new dividend will be

$$D_1 = \text{₹}80 \times 0.40 = \text{₹}32$$

Accordingly, new  $Ke$  will be

$$K_e = \frac{32}{1,460} + 6.0\% = 8.19\%$$

23. (a) As per Walter Model,  $P = \frac{D + (E - D)(r \div K_e)}{K_e}$

Where,

$P$  = Market price per share

$E$  = Earnings per share =  $\text{₹}10,00,000 \div 50,000 = \text{₹}20$

$D$  = Dividend per share =  $50\% \times 20 = \text{₹}10$

$r$  = Return earned on investment =  $12\% = 0.12$

$Ke$  = Cost of equity capital =  $10\% = 0.10$

$$P = \frac{10 + (20 - 10)(0.12 \div 0.10)}{0.10} = \frac{22}{0.10} = \text{₹}220$$

- (b) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is Nil. So, at a payout ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + (20 - 0)(0.12 \div 0.10)}{0.10} = \frac{24}{0.10} = \text{₹}240$$

24. (a) As per Walter's Model, Price per share is computed by using the following formula:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{18 + \frac{0.25}{0.15}(60 - 18)}{0.15} = \frac{18 + 70}{0.15} = \text{₹}586.67$$

- (b) As per Gordon's model, when  $r > Ke$ , optimum dividend payout ratio is 'Zero'.

25. (a) Cost of equity =  $Ke = \frac{1}{PE\ Ratio} = \frac{1}{12.5} = 0.08 = 8\%$

Rate of return on investment =  $r = 12\%$

As per Walter model,  $P_0 = \frac{D + \left(\frac{r}{Ke}\right)(E - D)}{Ke}$

$$130 = \frac{D + \left(\frac{0.12}{0.08}\right)(10 - D)}{0.08} \quad 10.40 = D + 15 - (1.5) D \quad D = 9.20$$

Thus, dividend payout ratio =  $\frac{D}{EPS} \times 100 = \frac{9.20}{10} \times 100 = 92\%$

- (b) Since, return (12%) is more than cost of equity (8%), thus optimal dividend payout ratio should be zero as per Walter model.

Price at optimum dividend ratio =  $\frac{D + \left(\frac{r}{Ke}\right)(E - D)}{Ke} = \frac{0 + \left(\frac{0.12}{0.08}\right)(10 - 0)}{0.08} = ₹187.50$

- (c) When  $Ke$  is equal to rate of return then dividend will have no effect on value of share.  
Thus,  $r = Ke = 12\%$

PE ratio =  $\frac{1}{Ke} = \frac{1}{0.12} = 8.33$  times

(d) Market price =  $\frac{D + \left(\frac{r}{Ke}\right)(E - D)}{Ke} = \frac{9.20 + \left(\frac{0.12}{0.12}\right)(10 - 9.20)}{0.12} = ₹83.33$

- (e)  $Ke = 8\%$ ,  $r = 12\%$ ,  $D_0 = 9.20$ ,  $b = 0.08$

$g = (b)(r) = (0.08)(0.12) = 0.0096$

$P = \frac{D_1}{Ke - g} = \frac{9.20(1 + 0.0096)}{(0.12 - 0.0096)} = ₹131.936$

26. (a) As per Walter Model,  $P = \frac{D + (E - D)(r \div Ke)}{Ke}$

Where,

$P$  = Market price per share

$E$  = Earnings per share =  $₹10,00,000 \div 2,00,000 = ₹5$

$D$  = Dividend per share =  $₹6,00,000 \div 2,00,000 = ₹3$

$r$  = Return earned on investment =  $20\% = 0.20$

$Ke$  = Cost of equity capital =  $\frac{1}{PE\ Ratio} = \frac{1}{10} = 0.10$

$P = \frac{3 + (5 - 3)(0.20 \div 0.10)}{0.10} = \frac{7}{0.10} = ₹70$

- (b) Capitalization rate of risk class =  $Ke = 10\%$

(c) According to Walter's model when the return on investment (20%) is more than the cost of equity capital (10%), the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is zero.

$$(d) \text{ At a zero payout ratio, market price per share} = \frac{0 + (5 - 0)(0.20 \times 0.10)}{0.10} = \frac{10}{0.10} = ₹100$$

**27. Market price per share by**

(a) Walter's model

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

(b) Gordon's model

$$\text{Present market price per share } (P_0) = \frac{E(1 - b)}{k - br} = \frac{10(1 - 0.40)}{0.20 - (0.4 \times 0.25)} = \frac{6}{0.1} = ₹60$$

**28. Earning available for equity = Net Profit – Preference Dividend**

$$= 30,00,000 - (1,00,00,000 \times 12\%) = ₹18,00,000$$

$$\text{Earnings per share} = \frac{\text{Earning available for Equity}}{\text{No. of Equity Shares}} = \frac{18,00,000}{(60,00,000 \div 10)} = ₹3$$

$$\text{Dividend payout ratio} = 100 - 75\% = 25\%$$

$$\text{Dividend per share} = \text{EPS} \times \text{Dividend payout ratio} = 3 \times 25\% = ₹0.75$$

$$\text{Rate of return } (r) = 22\% = 0.22$$

$$\text{Cost of equity } (K_e) = 18\% = 0.18$$

$$(1) \text{ As per Gordon's Formula, } P = \frac{E(1 - b)}{K_e - (b \times r)} = \frac{3 \times (1 - 0.75)}{0.18 - (0.75 \times 0.22)} = \frac{0.75}{0.015} = ₹50$$

$$(2) \text{ As per Walter Model, } P = \frac{D + (E - D)(r \div K_e)}{K_e} = \frac{0.75 + (3 - 0.75)(0.22 \div 0.18)}{0.18} = ₹19.44$$

**29.  $D_0 = 2.5 \cdot 4 = ₹10$  (annually)**

$$\text{Expected retention ratio} = b = (50 \cdot 0.30) + (60 \cdot 0.40) + (50 \cdot 0.30) = 54\%$$

$$g = (b)(r) = (0.54)(0.10) = 0.054 = 5.4\%$$

$$K_e = R_f + (\text{Beta} \cdot \text{Risk Premium}) = 3.75 + (1.2 \cdot 4.25) = 8.85\%$$

$$P_0 = \frac{D_0(1 + g)}{K_e - g} = \frac{10(1 + 0.054)}{0.085 - 0.054} = \frac{10.54}{0.0345} = ₹305.51$$

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

$$P = \frac{D_1}{(1 + K_e)^1} + \frac{D_2}{(1 + K_e)^2} + \frac{D_3}{(1 + K_e)^3} + \frac{D_4}{(1 + K_e)^4} + \frac{D_5}{(K_e - g)} \times \frac{1}{(1 + K_e)^5}$$

Where,

$P$  = Price per share

$K$  = Required rate of return on equity

$g$  = Growth rate

$$P = \frac{₹120 \times 1.15}{(1 + 0.2)^1} + \frac{₹138 \times 1.15}{(1 + 0.2)^2} + \frac{₹158.7 \times 1.15}{(1 + 0.2)^3} + \frac{₹182.5 \times 1.15}{(1 + 0.2)^4} + \frac{₹209.88 \times 1.05}{(0.2 - 0.05)^1} \times \frac{1}{(1 + 0.2)^4}$$

$$P = 115 + 110.2 + 102.6 + 101.2 + 708.14 = ₹1,140.14$$

Intrinsic value of share is ₹1,140.14 as compared to latest market price of ₹3,122. Market price of a share is overpriced by ₹1,981.86.

31.

Year	Particulars	Amount	PVF @ 16%	Present Value
1	Dividend	$140 \times (1+0.12) = 156.80$	0.847	132.81
2	Dividend	$156.8 \times (1+0.12) = 175.62$	0.718	126.10
3	Dividend	$175.62 \times (1+0.12) = 196.69$	0.608	119.59
4	Dividend	$196.69 \times (1+0.12) = 220.29$	0.515	113.45
		<b>Total</b>		<b>491.95</b>

$$\text{Price at end of 4th year, } P_4 = \frac{D_5}{K_e - g} = \frac{220.29(1+0.05)}{0.18-0.05} = ₹1,779.27$$

$$\text{Intrinsic value of equity share} = ₹491.95 + (₹1,779.26 \times 0.515) = ₹1,408.27$$

Intrinsic value (₹1,408.27) is higher as compared to market price (₹2,185), thus, the share is over-priced by ₹776.73.

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

**Step 1:** Calculate price at the end of the period

$$K_e = 10\%, P_0 = 100, D_1 = 0$$

$$P_0 = \frac{P_1 + D_1}{1 + K_e} = 100 = \frac{P_1 + 0}{1 + 0.10} \Rightarrow P_1 = 110$$

**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

$$\text{No. of shares } \Delta n = \frac{\text{Funds required}}{\text{Price at end } (P_1)} = \frac{1,00,000}{110}$$

**Step 4:** Calculation of value of firm

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

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

**CASE 2: Value of the firm when dividends are paid.****Step 1:** Calculate price at the end of the period

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

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

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

**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

$$\text{No. of shares} = \Delta n = \frac{\text{Funds required}}{\text{Price at end}(P_1)} = \frac{₹1,50,000}{₹105}$$

**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.

In real world, market imperfections create some problems for MM's dividend policy irrelevance proposition.

**33.** Given,

Cost of Equity ( $K_e$ )	10%
Number of shares in the beginning ( $n$ )	25,000
Current Market Price ( $P_0$ )	₹100
Net Profit ( $E$ )	₹2,50,000
Expected Dividend ( $D_1$ )	₹ 5 per share
Investment ( $I$ )	₹5,00,000



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

**34. (i) Calculation of market price per share**

According to Miller - Modigliani (MM) Approach:

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

Where,

Existing market price ( $P_0$ ) = ₹150

Expected dividend per share ( $D_1$ ) = ₹8

Capitalization rate ( $K_e$ ) = 0.10

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

(a) If expected dividends are declared, then

$$₹150 = \frac{P_1 + n8}{1 + 0.10}$$

$$\therefore P_1 = ₹165$$

(b) If expected dividends are not declared, then

$$₹150 = \frac{P_1 + 0}{1 + 0.10}$$

$$\therefore P_1 = ₹165$$

(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 × 157 = 1,950 (approx.)	11.82 × 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.