

Practice Questions and Solutions for Virtual Coaching Classes

Paper 8A: Financial Management

Topic: Dividend Decisions

Question-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 firms when dividends (i) are not paid (ii) are paid

Solution:

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

Step 1: Calculate price at the end of the period

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

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

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

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

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

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

Step 4: Calculation of value of firm

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

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

$$= \text{₹}10,00,000$$

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

Step 1: Calculate price at the end of the period

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

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

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

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

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

$$\Delta n = \frac{\text{₹}1,50,000}{\text{₹}105}$$

Step 4: Calculation of value of firm

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

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

$$= \text{₹}10,00,000$$

Question-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.

Solution:

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

Accordingly, value of a share:

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

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

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

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

At 50% pay-out ratio

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

At 75% pay-out ratio

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

At 100% pay-out ratio

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

Question-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%

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

Solution:

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore 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, $E_1 = 6$, $K_e = 16\%$

(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%

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

Question-4

CALCULATE price per share from the following information:

Earnings per share (EPS)	Rs. 20
Cost of equity capital	20%
Internal rate of return on investment	25%
Retention Ratio	50%

Solution:

$$\begin{aligned} \text{Market price per share (P}_0) &= \left[\frac{D_0(1+g)}{K_e - g} \right] \\ &= \frac{10(1+0.125)}{0.20-0.125} \\ &= \frac{11.25}{0.075} = \text{Rs. 150} \end{aligned}$$

Where,

P_0 = Present market price per share.

g = Growth rate (br) = $0.50 \times 0.25 = 0.125$

b = Retention ratio (i.e., % of earnings retained)

r = Internal rate of return (IRR)

$D_0 = E \times (1 - b) = 20 \times (1 - 0.50) = 10$

E = Earnings per share

Question-5

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.

Solution:

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

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

$$P = 2(18+10) = ₹ 56$$

Question-6

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.

Solution:

$$D_1 = D_0 + [(EPS \times \text{Target payout}) - D_0] \times Af$$

$$D_1 = 9.80 + [(20 \times 60\%) - 9.80] \times 0.45$$

$$D_1 = 9.80 + 0.99 = ₹ 10.79$$

Question-7

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.

Solution:

- (i) The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000/ 20,000). $r = 2,00,000 / (20,000 \text{ shares} \times ₹100) = 10\%$. The P/E Ratio is given at 12.5 and the cost of capital, K_e , may be taken at the inverse of P/E ratio. Therefore, K_e 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:

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

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 K_e 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.

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

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

Question-8

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 (K_e)	20%
Internal rate of return on investment	25%
Retention Ratio	40%

Solution:

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 (Dividend Growth model):**

$$\text{Present market price per share (P}_0\text{)} = \frac{E(1-b)}{k-br}$$

Where,

P_0 = Present market price per share.

E = Earnings per share

b = Retention ratio (i.e. % of earnings retained)

r = Internal rate of return (IRR)

Hint:

Growth rate (g) = br

Question-9

The following figures are extracted from the annual report of RJ Ltd.:

Net Profit	₹ 50 Lakhs
Outstanding 13% preference shares	₹ 200 Lakhs
No. of Equity Shares	6 Lakhs
Return on Investment	25%
Cost of Capital (K_e)	15%

You are required to compute the approximate dividend pay-out ratio by keeping the share price at ₹ 40 by using Walter's Model.

Solution:

Particulars	₹ in lakhs
Net Profit	50
Less: Preference dividend (₹ 200,00,000 x 13%)	26
Earning for equity shareholders	24
Therefore, earning per share = ₹ 24 lakh / 6 lakh shares = ₹ 4	

Let, the dividend per share be D to get share price of ₹ 40

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

$$₹ 40 = \frac{D + \frac{0.25}{0.15}(₹ 4 - D)}{0.15}$$

$$6 = \frac{0.15D + 1 - 0.25D}{0.15}$$

$$0.1D = 1 - 0.9$$

$$D = ₹ 1$$

$$D/P \text{ ratio} = \frac{DPS}{EPS} \times 100 = \frac{₹ 1}{₹ 4} \times 100 = 25\%$$

So, the required dividend pay-out ratio will be = 25%

Question-10

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 $r < K_e$
<i>r</i> (rate of return on retained earnings)	15%	10%	8%
K_e (Cost of Capital)	10%	10%	10%
<i>E</i> (Earning Per Share)	₹ 10	₹ 10	₹ 10
<i>b</i> (Retained Earnings)	0.6	0.6	0.6
$1 - b$ (Dividend Payout)	0.4	0.4	0.4

Solution:

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

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

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

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

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

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

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

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

Growth Firm

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

Normal Firm

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

Declining Firm

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

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.

Question-11

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

Earnings per share - ₹ 60

Capitalisation rate -15%

Return on investment- 25% per cent

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.

Solution:

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

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

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

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 $r > K_e$, optimum dividend payout ratio is 'Zero'.