9. DIVIDEND DECISIONS

NO. OF PROBLEMS IN 41.5E OF CA INTER: CLASSROOM - 10, ASSIGNMENT – 10

NO. OF PROBLEMS IN 42E OF CA INTER: CLASSROOM - 12, ASSIGNMENT – 12

NO. OF PROBLEMS IN 42.5E OF CA INTER: CLASSROOM - 9, ASSIGNMENT - 9

MODEL WISE ANALYSIS OF PAST EXAM PAPERS OF CA INTER (PROBLEMS)

MODEL NO.	MODEL NAME	M-18 (N)	N-18 (N)	M-19 (N)	N-19 (N)	RTP M18 (N)	RTP N18 (N)	RTP M19 (N)	RTP N19 (N)	MTP1 M18 (N)	MTP2 M18 (N)	MTP1 N18 (N)	MTP2 N18 (N)	MTP1 M19 (N)	MTP2 M19 (N)	MTP1 N19 (N)
1.	Walter's Model	-	5	2.5	5	5	5	-	5	-	-	-	-	-	5	-
2.	Gordon's Model	-	-	2.5	-	-	-	5	-	5	5	-	-	5	-	5
3	Graham and DODD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.	Linter's Model	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.	Modigilani & Miller Model	-	-	-	-	-	-	-	-	-	-	5	5	-	-	-
6.	Buy Back or Stock Repurchase	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Dividend policy is defined as the firm policy with regard to **paying out earnings** as dividends versus **retaining them for reinvestment in the firm.** Dividend policy involves for four issues:

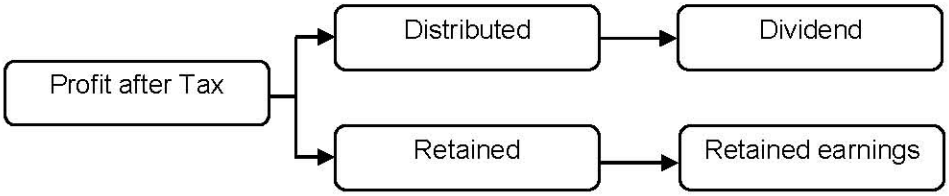
1. How much should be distributed?
2. In what form the distributions should be?
3. In what manner the distribution should be related to the cash earnings?
4. What should be the long term policy regarding the average percentage of earnings to be paid out to shareholders.

MEANING OF DIVIDEND:

Dividend is that part of profit after tax which is distributed to the shareholders of the company. In other words, the profit earned by a company after paying taxes can be used for:

i) Distribution of dividend or

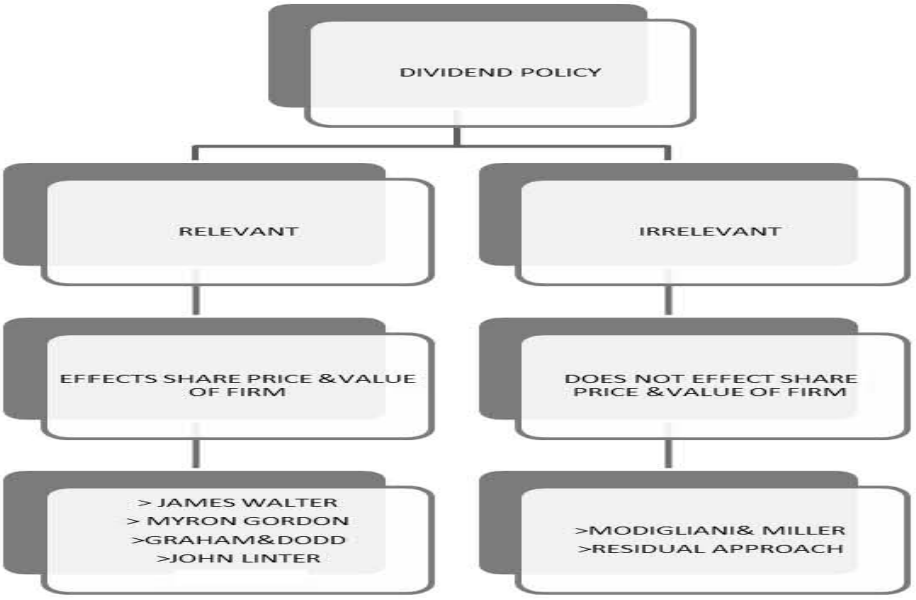
ii) Can be retained as surplus for future growth



DIVIDEND MODELS:

The various models on dividend deal with whether the declaration of dividend effects market price or not. The **dividend relevance theories** argue that the declaration of dividends **effect the market price of a share.**

Here dividends are said to be relevant to determining market price. The **dividend irrelevance theory** argues that the declaration of dividend **does not affect market price**. Here dividends are said to be irrelevant to determining market price.



MODEL 1: WALTER'S MODEL

1. **PROPOSITION**: In the long run, share prices reflect only the present value of expected dividends. Retentions influence the stock price only through their effect on the future dividends.
2. **ASSUMPTIONS:**

a) Capital Structure	• The Firm is an all Equity Firm. • The Firm will use only Retained Earnings to finance its investments.
b) Return	• Rate of Return on Investments (r) and the Cost of Equity (K_e) is constant, i.e. with every additional investment, business risk remains unaltered. • Earnings (E) and Dividends (D) are constant (i.e. they do not change). • All Earnings are either distributed or retained internally.
c) Life	The Firm has a perpetual life.

3. **FORMULAE:** Current market value/ Current market price per share:

$$P_0 = \frac{D + \frac{r}{k_e}(E - D)}{k_e}$$

Where,

D = Dividend / Dividend per Share

E = Equity Earnings / Earnings per Share

r = Rate of Return on Investment by Company

K_e=Cost of Equity

4. **IMPLICATIONS/INFERENCES:** Higher the **retention ratio**, higher is the Value of the Firm, and vice-versa. Hence,

Nature of Firm	Growth Firm ($r > K_e$)	Normal Firm ($r = K_e$)	Declining Firm ($r < K_e$)
Optimal Payout Ratio	Nil	Irrelevant	100%
Reason	Shareholders expect the Company to do well with internal financing, rather than by dividend distribution	Shareholders are indifferent between Distributed and Retained Earnings.	Shareholders would prefer a higher dividend so that they can use the funds so obtained elsewhere in more profitable opportunities.

Thus, the above formula explains why Market Prices of Shares of Growth 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.

5. **CRITICISMS:**

a) **No External Financing:** Assumption of 100% Equity Funding defeats the objective of maximization of wealth, considering the leverage effect of lower Cost of Debt Capital.

b) **Constant Rate of Return:** When the amount of Investments increase, the return made for every incremental rupee of investment falls. The assumption as to 'r' being constant is not realistic.

c) **Constant K_e:** The Firm's Cost of Capital does not remain constant. It changes with changes in the Firm's risk. Firm's risk undergoes a change over time. By assuming a constant Discount Rate (i.e. Cost of Equity), this model ignores the effect of risk on the value of the Firm.

PROBLEM NO 1: CEE Towers Ltd, an all Equity Company, has a PAT of Rs.200 Crores and 10,00,000 Shares of 10 each outstanding as at the end of the financial year. Its Cost of Capital is 12%. CEE Towers can earn 15% on its investment. Ascertain the value of the Company under Walter's Model, if the payout ratio is - (a) 20%, (b) 40%, (c) 60%, and (d) 80%. Also draw out the inference from the values obtained under different cases.

(B) (ANS.: FIRM VALUE - A) 2,000 CR; (B) 1,916.67CR; (C) 1,833.33CR, (D) 1,750 CR)

(SOLVE PROBLEM NO.1 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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PROBLEM NO 2: The following information is supplied to you:

Particulars	Rs.	Particulars	Rs.
Total Earnings	2,00,000	Dividend paid	1,50,000
No. of Equity Shares of Rs100 each	20,000	PE ratio	12.5

Applying Walter's model

1. Find out the value of share at present dividend payout ratio?
2. Ascertain whether the Company is following an optimal dividend policy and find out market value of share at that policy?
3. Find out what should be the P/E ratio at which the Dividend Policy will have no effect on the value of the share.
4. Will your decision change, if the P/E ratio is 8 instead of 12.5?

(A) (NEW SM - TYK, CA FINAL OLD PM, RTP N 19 (N),MTP2 M19 (N)) (ANS.: 1. 132.81; 2. 156.25; 3. P/E RATIO: 10 TIMES, 4. P = RS. 76)

(SOLVE PROBLEM NO.2 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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PROBLEM NO 3 The following information are available for XYZ CO.

- No. of shares outstanding is 1 Lakh
- EPS is Rs 4
- DPS is Rs 2.4
- Equity capitalization rate: 12%
- Rate of return on investment : 15%

i) As per Walter's model, what will be Market value per Share?

ii) To keep Share price at Rs.40, what should be payout ratio?

iii) As per Walter's model, what is optimum payout ratio?

iv) Market Value at that payout ratio?

(A) (ANS.: (I) MARKET VALUE PER SHARE: RS.36.67; (II) PAYOUT RATIO: 20% OR 0.2, (III) OPTIMUM PAYOUT RATIO IN THE PRESENT CASE SHOULD BE NIL, (IV) MARKET VALUE: RS.41.66)

(Similar NOV-19)(SOLVE PROBLEM NO.3 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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MODEL 2: GORDON'S MODEL

1. **PROPOSITION:**

   a) Dividends of Companies are expected to grow. So, Value of Shares is the Present Value of Future Dividends, which are expected to grow at a constant rate.

   b) Higher the Earnings Retention Rate, the greater the required future return from investments, to compensate for the risk involved.

   c) Risk attitude of Investors will ensure that 'r' (Rate of Return on Investment) will rise for each successive year in the future, to reflect growing uncertainty.

2. **ASSUMPTIONS:**

a) Capital Structure	• The Firm is an all Equity Firm. • The Firm uses only Retained Earnings to finance its Investments.
b) Return	• Rate of Return on the Firm's Investments (r) is constant. • Cost of Equity (K_e), Retention Ratio (b), and Growth Rate (g) are constant. • K_e > Growth Rate (g) [where Growth = Retention Ratio x Return on Equity, i.e. **g = br**)
c) Others	• The Firm has a perpetual life. • There are no taxes.

3. **FORMULA:** Current Market Value / Current Market Price per Share

$$P_0 = \frac{D_1}{k_e - g} = \frac{E(1-b)}{k_e - br}$$

Where, D_1 = Dividend per Share for the next year

E_1 = Earnings per Share for the next year.

K_e= Cost of Equity

g = Growth Rate in Dividend = Retention Ratio x Return on Investment, i.e. g = br.

b = Retention Ratio

r =Rate of Return on Investment

4. **IMPLICATIONS:** Dividend payments and its growth are relevant in valuation of shares hence, the linkage between dividend payment and retention will be as under.

Nature of Firm	Growth Firm ($r > K_e$)	Normal Firm($r = k_e$)	Declining Firm ($r < k_e$)
Optimal Payout Ratio	Nil	irrelevant	100%

5. **CRITICISMS:**

   a) **No External Financing:** Assumption of 100% Equity Funding defeats the objective of maximization of wealth, considering the leverage effect of lower Cost of Debt Capital.

   b) **Constant Rate of Return:** When the amount of Investments increase, the return made for every incremental rupee of investment falls. The assumption as to 'r' being constant is not realistic.

   c) **Constant K_e:** The Firm's Cost of Capital does not remain constant. It changes with changes in the Firm's risk. Firm's risk undergoes a change over time. By assuming a constant Discount Rate (i.e. Cost of Equity), this model ignores the effect of risk on the value of the Firm.

PROBLEM NO 4: The following figures are collected from the annual report of XYZ Ltd.:

Net Profit	Rs.30 lakhs
Outstanding 12% preference shares	Rs.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%. *(Similar to MTP NOV 19 (N)),(B) (RTP M19 (N)) (May-19,RTP)(ANS.: I) RS. 150; II) RS. 50; III) RS. 37.50)*

(SOLVE PROBLEM NO.4 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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PROBLEM NO 5: A firm had been paid dividend at Rs. 2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 15.5%. *(A) (NEW SM, MTP1 M18 (N)) (ANS.: (I) P = 20; P = RS.28.80 (II) P = RS.16.48)*

(SOLVE PROBLEM NO.5 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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PROBLEM NO 6: In December, 2017 AB Co.'s share was sold for Rs. 146 per share. A long term earnings growth rate of 7.5% is anticipated. AB Co. is expected to pay dividend of Rs. 3.36 per share.

i) Determine 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 AB Co. will earn about 10% on book Equity and shall retain 60% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity? Analyse. *(A) (MTP2 M18 (N))*

(ANS.: I) K_E = 9.80%; II) REVISED G = 6%, K_E = 9.68%) *(SOLVE PROBLEM NO.6 OF ASSIGNMENT PROBLEMS AS REWORK)*

Note: _____

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MODEL 3: MODIGLIANI AND MILLER MODEL

1. **PROPOSITION:**
   a) The Firm's Dividend Policy has no effect on its value of assets. Thus, Dividends are **irrelevant** to Shareholder's wealth.
   b) Value of a Firm depends on the Earnings of the Firm, and is unaffected by the pattern of Income Distribution.
2. **ASSUMPTIONS:**
   a) **Perfect Market:** Capital Markets are perfect. Investors are free to buy and sell securities. They are well informed about the risk and return of all type of securities. There are no transaction costs. The Investors behave rationally. They can borrow without restrictions on the same terms as the Firms do.
   b) **No Tax:** There are no taxes (Corporate and Personal). If taxes exist, the tax rates are the same for Dividend and Capital Gains.
   c) **Fixed Investment Policy:** The Firm has a fixed investment policy under which at each year-end, it invests a specific amount as Capital Expenditure.
   d) **No Risk of Uncertainty:** Investors are able to predict future dividends and future market prices and there is only one discount rate for the entire period. So, r = k= k_t for all t.
   e) **No Debt:** All Investments are funded either by Equity or by Retained Earnings.

3. **FORMULA:**

a) **Value of the firm:** Present value of total market capitalization at the end of year 1 **less** value of additional capital raised at the end of year 1.

$$\text{So } nP_0 = \frac{(n+m)P_1 - I_1 + X_1}{1+K_e}$$

NOTATION	FACTOR
N	Number of Shares Outstanding at the beginning of the period
M	Number of Shares issued at the end of the year at P_1
P_0	Market Price per Share at the beginning of the year/period i.e. at Time-0 (now)
P_1	Market Price per Share at the end of the year/ period
I_1	Investment at the end of the year/ period
X_1	Net Retained Earnings after Tax for the year / period
K_e	Cost of equity

Market price per share at time 0(denoted by P_0): Since Next Year Price = This Year Price $(1+K_e)$ **less** Dividends, i.e. $P_1 = P_0 (1+k_e)$ **less** D_1, it follows that **P_0**= Present Value of (Price at the end of Year 1 + Dividend Receivable as on that date) = $\frac{P_1 + D_1}{1+K_e}$

b) **No. of Shares to be issued at the end of the Year for New Projects (denoted by N):**

$$= \frac{\text{Total Investment (-) [Earnings for Yr 1 (-) Total Dividends at end of Yr 1 for existing Shares]}}{\text{Price per Share at the end of Year 1}}$$

$$= \frac{I - (E - nD_1)}{p_1}$$

4. **IMPLICATIONS:**

a) Higher the retention ratio, higher is the capital appreciation enjoyed by the Shareholder. The Capital **Appreciation** equal to the amount of earnings retained.

b) If the Company distributes earnings by way of dividends, the Shareholder enjoys dividends equal to the amount of capital appreciation if the Company had retained the amount of dividends.

PROBLEM NO 7: (PRINTED SOLUTION AVAILABLE) RST Ltd. has a capital of Rs.10,00,000 in equity shares of Rs.100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs.10 per share at the end of the current financial year. The capitalization rate for the risk class of which the company belongs is 12%. What will be the market price of the share at the end of the year, if

i) A dividend is not declared?

ii) A dividend is declared?

iii) Assuming that the company pays the dividend and has net profits of Rs.5,00,000 and makes new investments of Rs.10,00,000 during the period, how many new shares must be issued? Use the MM model.

(A) (NEW SM, MTP2 N18 (N)) (ANS.: (I) P_1 = 112; (II) P_1 = 102, (III) 5,883 SHARES)

(SOLVE PROBLEM NO.10 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

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PROBLEM NO 8: M 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 Rs.100. It expects a net profit of Rs.2, 50,000 for the year and the Board is considering dividend of Rs.5 per share. M Ltd. requires to raise Rs.5,00,000 for an approved investment expenditure. Show, how the MM approach affects the value of M Ltd. If dividends are paid or not paid.

(A) (NEW SM - TYK, MTP1 N18 (N))

(ANS.: VALUE OF FIRM, WHEN DIVIDENDS ARE PAID = RS. 25,00,000, WHEN DIVIDENDS ARE NOT PAID = RS. 25,00,000)

(SOLVE PROBLEM NO.11 OF ASSIGNMENT PROBLEMS AS REWORK)

MODEL 4: BUY BACK OR STOCK REPURCHASE

MEANING:

There are two ways in which a company can reward its shareholders. One, it can pay dividends.

Two, it can buy back shares. Buy-back of shares means repurchase of shares of the company by the company. This leads to reduction in the share capital of the company. Normally buy-back is resorted to when a company has large unutilized surplus cash. Since the cash is surplus, it is assumed that buy- back will not affect the future earnings of the company.

PRICING OF BUYBACK:

1. Company should fix its buy back price so that an investor who does not accept. the buy-back offer does not lose relative to an investor who accepts the buy-back offer.
2. Buy-back is normally undertaken when there is surplus cash. Consequently the market capitalization pre buy-back and the market capitalization post buy-back are assumed to be equal. Remember market capitalization is the present value of future cash flows and future cash flows are going to be unaffected by buy-back since the same takes place from surplus cash.
3. The theoretical post buy back price (i.e. the price at which the shares would trade after the buyback is over) would be $\frac{S \times P_0}{(S - N)}$

   Where, S = Number of Shares outstanding before Buy-back

   P_0 = Current Market Price

   N = No. of shares to be buy-back

PROBLEM NO 9: (PRINTED SOLUTION AVAILABLE) Rahul Ltd has surplus cash of Rs.100 Lakhs and wants to distribute 27% of it to the Shareholders. The Company decides to buy-back Shares. The Finance Manager of the Company estimates that its Share after re-purchase is likely to be 10% above the buyback price - if the buyback route is taken. The number of shares outstanding at present is 10 Lakhs, and the current EPS is Rs.3.

You are required to determine:

a) Price at which the Shares can be re - purchased, if the market capitalization of the Company should be Rs.210 Lakhs after buyback,

b) Number of Shares that can be re-purchased, and

c) Impact of Share re - purchase on the EPS, assuming that Net Income is the same.

(B) (ANS.: (1) MARKET CAPITALIZATION AFTER BUY BACK - RS.210 LAKHS, (2) 1,23,905 SHARES, BUY BACK PRICE - RS21.79, (3) POST BUY BACK EPS - RS.3.42, THE EPS WILL INCREASES POST BUY BACK)

(SOLVE PROBLEM NO.12 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NO: 1

1. Firm value under Walter's model

Value of the firm (P_0)= $\frac{D + [(E - D) \times (r \div K_{e)}]}{k_e}$

2. **Value of CEE towers ltd** (E= Rs.200crores, r=15%, K_e=12%)

Payout ratio is	Dividend (earnings Rs.200cr × payout ratio)	Computation $[D + \{(E-D) \times (\frac{r}{K_e})\}] \div K_e$	Firm value
20%	Rs.200cr × 20% = Rs.40cr	$\frac{40 + \{(200 - 40) \times (15\% \div 12\%)\}}{12\%} = \frac{40 + \{160 \times 1.25\}}{12\%} = \frac{40 + 200}{12\%} = \frac{Rs.240cr}{12\%}$	**Rs.2000.00 crores**
40%	Rs.200cr × 40% = Rs.80cr	$\frac{80 + \{(200 - 80) \times (15\% \div 12\%)\}}{12\%} = \frac{80 + \{120 \times 1.25\}}{12\%} = \frac{80 + 150}{12\%} = \frac{Rs.230cr}{12\%}$	**Rs.1916.67 crores**
60%	Rs.200cr × 60% = Rs.120cr	$\frac{120 + \{(200 - 120) \times (15\% \div 12\%)\}}{12\%} = \frac{120 + \{80 \times 1.25\}}{12\%} = \frac{120 + 100}{12\%} = \frac{Rs.220cr}{12\%}$	**Rs.1833.33 crores**
80%	Rs.200cr × 80% = Rs.160cr	$\frac{160 + \{(200 - 160) \times (15\% \div 12\%)\}}{12\%} = \frac{160 + \{40 \times 1.25\}}{12\%} = \frac{160 + 50}{12\%} = \frac{Rs.210cr}{12\%}$	**Rs.1750.00 crores**

Inference: Since the company can earn more than the cost of equity (i.e., return 15% > cost of equity 12%) investors stand to gain, if they draw lower amount of dividends. As the dividend amount increases, the value of the flrm decreases for a growth firm ($r > K_e$).

PROBLEM NO: 2

i) The EPS of the firm is Rs.10 (i.e., Rs.2,00,000 / 20,000). 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 Rs.1,50,000 among 20,000 shares, giving a dividend per share of Rs.7.50. The value of the share as per Walter's model may be found as follows:

$$P = \frac{D}{K_e} + \frac{(E-D) \times \frac{r}{K_e}}{K_e} = \frac{7.50}{0.08} + \frac{(10-7.5) \times \frac{0.10}{0.08}}{0.08} = Rs.132.81$$

ii) The firm has a dividend payout of 75% (i.e., Rs.1,50,000) out of total earnings of Rs.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

$$P = \frac{D}{K_e} + \frac{(E-D) \times \frac{r}{K_e}}{K_e} = \frac{0}{0.08} + \frac{(10-0) \times \frac{0.10}{0.08}}{0.08} = Rs.156.25$$

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

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 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.

iv) 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

$$P = \frac{D}{K_e} + \frac{(E-D) \times \frac{r}{K_e}}{K_e} = \frac{7.50}{0.125} + \frac{(10-7.5) \times \frac{0.1}{0.25}}{0.125} = Rs.76$$

PROBLEM NO: 3

(i) Walter's model is given by

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

Where

P = Market price per share.

E = Earnings per share = ` 5 D = Dividend per share = R = Return earned on investment = 15% Ke = 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 NO: 4

	Rs. 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:

$$P0 = \frac{E1(1-b)}{ke-b}$$

Here, E1 = 6, Ke = 16%

i) When dividend pay-out is 25%

$$P0 = \frac{6*0.25}{0.16-(0.5*0.2)}=\frac{1.5}{0.16-0.15}=150$$

ii) When dividend pay-out is 50%

$$P0 = \frac{6*0.5}{0.16-(0.5*0.2)}=\frac{3}{0.16-0.10}=50$$

iii) When dividend pay-out is 100%

$$P0=\frac{6*1}{0.16-(0*0.2)}=\frac{6}{0.16}=37.50$$

PROBLEM NO: 5

Calculation of M.V of shares under various circumstances

Particulars	Case(a)	Case(b)	Case©
D.P.S0 = D.P.S1 x(1+g)	=2x(1+0.05) = 2.2	=2x(1+0.08) = 2.16	=2(1+0.03) = 2.06
Ke	15.5%	15.5%	15.5%
g	5%	8%	3%

$M.P0 = \frac{D}{ke - g}$	$= \frac{2.1}{15.5\% - 5\%} = 20$	$= \frac{2.16}{15.5\% - 8\%} = 28.80$	$= \frac{2.06}{15.5\% - 3\%} = 16.48$

PROBLEM NO: 6

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

$$\frac{D1}{P1} + g$$

Where,

K_e = Cost of equity share capital

D_1 = Expected dividend at the end of year 1

P_0 = Current market price of the share.

g = Expected growth rate of dividend

Therefore, $K_e = \frac{3.36}{146} + 7.5\%$

$= 0.0230 + 0.075 = 0.098$

Or, $K_e = 9.80\%$

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

g = br i.e.

= 0.10 X 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: $0.075 = b_1 \text{ X } 0.10$

$b_1 = 0.75$ and payout ratio = 0.25

With 0.25 payout ratio the EPS will be as follows:

$$= \frac{3.36}{0.25} = 13.44$$

With new 0.40 (1 – 0.60) payout ratio the new dividend will be $D_1 = 13.44 \text{ X } 0.40 = 5.376$

Accordingly new K_e will be

$$= \frac{5.376}{146} + 6.0\%$$

Or, $K_e = 9.68\%$

PROBLEM NO: 7

Given,

Cost of Equity (Ke)	12%
Number of shares in the beginning (n)	10,000
Current Market Price (P_0)	Rs.100
Net Profit (E)	Rs.2,50,000
Expected Dividend	Rs.10 per share
Investment (I)	Rs.5,00,000

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

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

$P_1 = 112 - 0 = 112$

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

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

$P_1 = 112 - 10 = 102$

(iii) Calculation of funds 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 = Rs.6,00,000

$$\text{No of shares} = \frac{\text{funds required}}{\text{price at the end}(P_1)}$$

$$\Delta n = \frac{600,000}{102} = 5882.35 \text{ or } 5883 \text{ shares}$$

PROBLEM NO: 8

Given,

Cost of Equity (Ke)	10%
Number of shares in the beginning (n)	25,000
Current Market Price (P0)	Rs.100
Net Profit (E)	Rs.2,50,000
Expected Dividend	Rs.5 per share
Investment (I)	Rs.5,00,000

Case 1 - When dividends are paid

Step 1

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

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

$P_1 = 110 - 5 = 105$

Step 2

Calculation of funds required for investment:

Earnings	2,50,000
Dividend Distributed	1,25,000
Retained Earnings	1,25,000
Total Amount require for Investment	5,00,000
Retained Earnings	1,25,000

Case 2 – When dividends are not paid

Step 1

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

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

$P_1 = 110 - 0 = 110$

Step 2

Calculation of funds required for investment:

Earnings	2,50,000
Dividend Distributed	NIL
Retained Earnings	2,50,000
Total Amount required for Investment	5,00,000
Retained Earnings	2,50,000

Balance funds required through fresh issue	3,75,000	Balance funds required through fresh issue	2,50,000
Step 3 **No. of shares required to be issued for balance fund** No of shares = $\frac{\text{funds required}}{\text{price at the end}(P_1)}$ $\Delta n = \frac{375000}{105}$ = 3,571.4285		**Step 3** **No. of shares required to be issued for balance fund** No of shares = $\frac{\text{funds required}}{\text{price at the end}(P_1)}$ $\Delta n = \frac{250000}{110}$ = 2,272.73	
Step 4		**Step 4**	
Calculation of value of firm		**Calculation of value of firm**	
$V_f = \frac{(n+\Delta n)P - I + E}{1+K_e}$ $V_f = \frac{\left(25000 + \frac{375000}{105}\right)105 - 500000 + 250000}{(1+0.10)}$ = Rs.25,00,000		$V_f = \frac{(n+\Delta n)P - I + E}{1+K_e}$ $V_f = \frac{\left(25000 + \frac{250000}{110}\right)110 - 500000 + 250000}{(1+0.10)}$ = Rs.25,00,000	

PROBLEM NO: 9

i) Let be the buyback price decided by Rahul Ltd.

market capitalisation afterbuyback

1. 1P(riginal shares – shares bought back)

   = 1.1p(10lakhs- 27% of 100 lakhs/P)

   = 11 lkahs x P – 27 lakhs x 1.1 = 11 lakhsP – 29.7 lakhs

   Again, 11 lakhsP – 210 lakhs +29.7 lakhs

   Or P = 239.7/11 = Rs 21.79 per share

ii) Number of shares to be bought back:

Rs 27 lakhs = 1.24 lakhs (approx.) or 123910 share

Rs 21.79

iii) New equity shares:

10 lakhs - 1.24 lakhs = 8.76 lakhs or 100000 – 123910 = 876090

Therefore, EPS = 3x10lakhs/8.76 lakhs = Rs 3.43

Thus, EPS of Rahul ltd., increases to Rs 3.43

ASSIGNMENT PROBLEMS

MODEL 1: WALTER MODEL

PROBLEM NO 1: The Earnings per Share of a Company is Rs.10 and the Rate of Capitalization applicable to it is 10%. The Company has three options of paying dividend, i.e. (i) 50%, (ii) 75% and (iii) 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% on its Retained Earnings. ***(B) (RTP N18 (N))***

(ANS.: VALUE PER SHARE (A) (I) RS.125, (II) RS.112.5, (III) RS.100, (B)(I) RS.100, (II) RS.100, (III) RS.100, (C)(I) RS.75, (II) RS.87.50, (III) RS.100.)

PROBLEM NO 2: A Ltd. Was started a year back with equity capital of Rs.40 lakhs. The other details are as under:

Earnings of the company	Rs.4,00,000	Dividend paid	Rs.3,20,000
Price- Earnings ratio	12.5	Number of Shares	40,000

i) Find the current market price of the share? Use Walter's model?

ii) Find whether the company's D/P ratio is optimal. Use Walter's formula.

iii) Find what should be P/E ratio at which dividend pay-out ratio will have no effect the value of the share i.e. PE Ratio at which price of share will always remain same at any dividend pay- out ratio.

(A) (ANS.: (I) MARKET PRICE OF THE SHARE (P_0) RS.131.25, (II) D/P RATIO IS NOT OPTIMUM, (III) PE RATIO -10TIMES, K_E - 12.5)

PROBLEM NO 3: The following information pertains to M/S XY Ltd.

Earnings of the Company	RS.5,00,000
Dividend Payout Ratio	60%
No. of Shares outstanding	1,00,000
Rate of Return on Investment	15%
Equity Capitalization Rate	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 the Market Value of Company's Share at that payout ratio?

c) To keep share price at Rs.50; What would be the dividend payout ratio?

(similar to RTP NOV 19(O)),(A) (NEW SM, SIMILAR: RTP M18, SIMILAR: N18 (N) - 5M)

(ANS.: A) MARKET VALUE PER SHARE - 45.83; B) 0%, VALUE PER SHARE AT OPTIMAL PAYOUT - 52.08; C) D/P RATIO: 20%)

MODEL 2: GORDON'S MODEL

PROBLEM NO 4: Three companies-A, B and C are operating under the same business risk class that calls for a return of 10% to the shareholders earn 15%, 10% and 12% respectively. If their earnings per share in the upcoming year are Rs.10 what would be the price of the shares under the following three alternative payout levels (i) 30% (ii) 60% (iii) 80%? Using the Gordon's model?

(B) (ANS.: (I) A - RS.60, B - RS.100, C - RS.187.5, (II) A - RS.150, B - RS.100, C - RS.115.38, (III) A - RS.114.29, B RS.100, C - RS.105.26)

PROBLEM NO 5: A firm had been paid dividend at Rs. 10 per share last year. The estimated growth of the dividends from the company is estimated to be 10% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 12%, and (ii) falls to 8%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 20%.

(A) (ANS.: P = RS. 110; (I) P = RS. 140; (II) P = RS. 90)

PROBLEM NO 6: In January, 2019 MN Co.'s share was sold for Rs. 500 per share. A long term earnings growth rate of 10% is anticipated. MN Co. is expected to pay dividend of Rs. 50 per share.

i) Determine rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 10% per year in perpetuity?

ii) It is expected that AB Co. will earn about 20% on book Equity and shall retain 30% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity? Analyse.

(A) (ANS.: I) K_E = 20%; II) REVISED G = 6%, K_E = 20%)

MODEL 3: MODIGLIANI AND MILLER MODEL

PROBLEM NO 7: X Ltd., has 8 lakhs equity shares outstanding at the beginning of the year. The current market price per share is Rs.120. The Board of Directors of the company is contemplating Rs.6.4 per share as dividend. The rate of capitalization, appropriate to the risk-class to which the company belongs, is 9.6%:

i) Based on MM Approach, calculate the market price of the share of the company, when the dividend is - (a) declared; and (b) not declared.

ii) How many new shares are to be issued by the company, if the company desires to fund an investment budget of Rs.3.20crores by the end of the year assuming net income for the year will be Rs.1.60crores? *(CA FINAL OLD PM)*

(A) (ANS.: (I) SHARE PRICE WHEN DIVIDEND DECLARED - RS.125.12, WHEN DIVIDEND IS NOT DECLARED - RS.131.52, (II) NO OF SHARES TO BE ISSUED IF DECLARED DIVIDEND - 1,68,798, IF DIVIDEND NOT DECLARED - 1,21,655)

PROBLEM NO 8: AB Engineering ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at Rs.100 each. The firm is contemplating the declaration of a dividend of Rs.5 per share at the end of the current financial year. It expects to have a net income of Rs.1,00,000 and has a proposal for making new investments of Rs.2,00,000. Find out the value of the firm if (i) dividend is paid; (ii) dividend is not paid. *(NEW SM)*

(A) (ANS.: I) VALUE OF THE FIRM WHEN DIVIDEND ARE NOT PAID - RS.10,00,000, II) WHEN DIVIDEND ARE PAID - RS.10,00,000)

MODEL 4: BUY BACK OR STOCK REPURCHASE

PROBLEM NO 9: Meera Ltd. has surplus cash of Rs. 50 Lakhs and wants to distribute 27% of it to the Shareholders. The Company decides to buy-back Shares. The Finance Manager of the Company estimates that its Share after re-purchase is likely to be 10% above the buyback price - if the buyback route is taken. The number of shares outstanding at present is Rs. 5 Lakhs, and the current EPS is Rs. 1.5.

You are required to determine:

a) Price at which the Shares can be re - purchased, if the market capitalization of the Company should be Rs. 105 Lakhs after buyback,

b) Number of Shares that can be re-purchased, and

c) Impact of Share re - purchase on the EPS, assuming that Net Income is the same.

(B) (ANS.: (1) MARKET CAPITALIZATION AFTER BUY BACK - RS. 7.5 LAKHS, (2) 61,952 SHARES, BUY BACK PRICE - RS. 21.79; (3) POST BUY BACK EPS - RS. 1.712, THE EPS WILL INCREASE POST BUY BACK)

THE END