9. DIVIDEND DECISIONS

NO. OF PROBLEMS IN 40E OF CA INTER: CLASSROOM - 17, ASSIGNMENT - 15

NO. OF PROBLEMS IN 41E OF CA INTER: CLASSROOM - 13, ASSIGNMENT - 14

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

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

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:

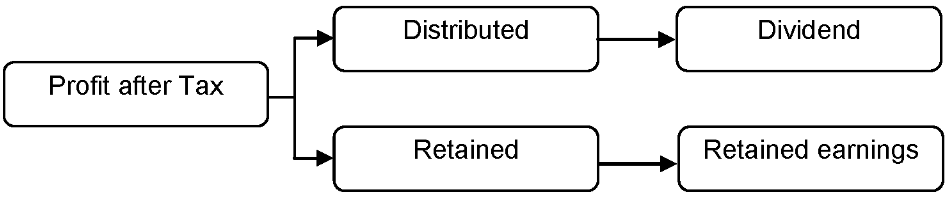
1. How much should be distributed?
2. In what form the distributions should be?
3. In what manner the distribution should be related to the cash earnings?
4. What should be the long term policy regarding the average percentage of earnings to be paid out to shareholders.

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

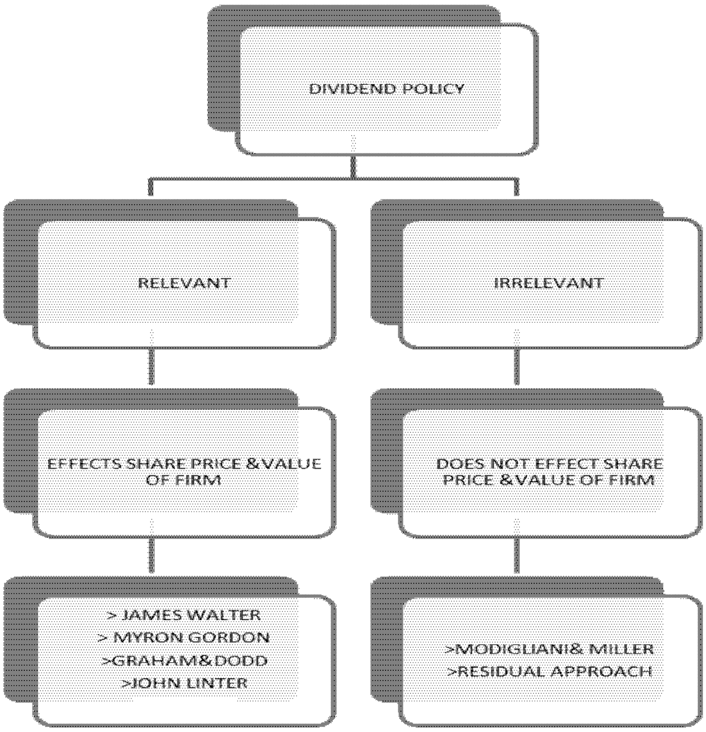
ii) Can be retained as surplus for future growth



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 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: (PRINTED SOLUTION AVAILABLE) 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: (PRINTED SOLUTION AVAILABLE) 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, 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)

(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%. ***(B) (RTP M19 (N)) (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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PROBLEM NO 7: The following information is collected from the annual reports of J Ltd:

Profit before tax	Rs.2.50 crore
Tax rate	40 percent
Retention ratio	40 percent
Number of outstanding shares	50,00,000
Equity capitalization rate	12 percent
Rate of return on investment	15 percent

What should be the market price per share according to Gordon's model of dividend policy and walter model? ***(A) (CA FINAL OLD PM) (ANS.: P_0 = RS.30; P_0 = RS.27.5)***

(SOLVE PROBLEM NO.7 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____

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MODEL 3: GRAHAM & DODD

1. Propositions	**a)** Investors assign more weights to Dividends (3 times) than to Retained Earnings (1 time). **b)** Investors use a higher discount rate for distant dividends (Capital Gains) than for near dividends. This is because nearby dividends are more certain than distant dividends.

2.	Assumptions	**a)** The Firm has a perpetual life. **b)** Investors are rational. **c)** Under conditions of uncertainty, Investors turn risk-averse.
3.	Formula	Present Market Price per Share (or) Present Value per Share $(P) = m \times (D + \frac{E}{3})$ where m= Multiplier, D = Dividend Per Share, and F = Earnings Per Share
4.	Implication / Inference	**a)** A Company following a liberal payout policy has a favorable impact on Stock Prices. **b)** Higher the Payout Ratio of a Firm, the higher its Market Price.
5.	Criticism	Weights (4 times and 1 time) are derived subjectively, without any empirical analysis.

PROBLEM NO 8: The following information regarding the equity shares of M ltd. is given:

Market price	Rs.58.33
Dividend per share	Rs.5
Multiplier	7

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

(C) (NEW SM) (ANS.: P: RS.10) (SOLVE PROBLEM NO.8 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____

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MODEL 4: LINTER'S MODEL

1. **PROPOSITION:**

a) Current Year's Dividend is dependent on - (a) Current Year's Earnings, and (b) Last Year's Dividend. Thus, Dividends are the Weighted Average of Past Earnings.

b) Investment Needs are not a major consideration in the determination of Dividend Policy.

c) There are two parameters in determination of Dividend, viz. (a) Target Pay - out Ratio, and (b) Spread at which Current Dividends adjust to the target.

2. **ASSUMPTIONS:**

a) Firms set long run target payout ratios based on projects available and earnings level.

b) Mangers are concerned more about change in the dividend than the absolute level.

c) Dividends tend to follow Earnings, but dividends follow a smoother path than Earnings.

d) Dividends are sticky in nature, because Managers have reluctance to effect dividend changes that may have to be reversed.

3. **FORMULA:** Dividend for Year 1 (D_1) = D_0+ af x [(E_1 x TP) - D_0)]

Where D_0 = Dividend for Year 0

af = Adjustment Factor

E_1 = Earnings for Year 1

TP = Target Payout Ratio

4. **CRITICISMS:**

a) This model does not help in ascertaining the Market Price per Share, i.e. it ignores the effect of Dividend on Market Price of a Share.

b) Adjustment Factor is an arbitrary number.

PROBLEM NO 9: The target payout ratio for DYNAMIC SUPER MARKET LTD. is 0.4 .The dividend per share for the current year is Rs.14. The dividend per share in the previous year was Rs.12. The weightage given to the current year earnings is 0.60. The number of Equity Shares outstanding in the company is 10,00,000 .If P/E multiple is 9, applying Linter Model of dividend policy to the company, compute the market capitalization of the company. ***(C) (ANS.: MARKET CAPITALIZATION: RS.34,49,70,000)***

(SOLVE PROBLEM NO.9 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____

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MODEL 5: 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.

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

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) = $\dfrac{P_1 + D_1}{1+K_e}$

   - **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 10: (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 11: (PRINTED SOLUTION AVAILABLE) 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, 12 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____

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MODEL 6: 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 12: 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.13 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____

MODEL 7: BONUS SHARES, STOCK SPLIT & REVERSE SPLIT

MEANING: Bonus Dividend is the capitalization of a Company's reserves, i.e. instead of distributing Accumulated Profits and Reserves as Dividends, the Company can resort to issuing shares without any consideration, to the extent of such reserves.

REASONS:

a) It broadens the Capital Base and improves the image of the company.

b) It attracts more Investors to invest in the stock.

c) It makes more Shares available and broadens the Company's Stockholders Base. Thus, the Stock becomes more marketable and liquid.

d) It brings the Paid up Capital of the Company in line with Actual Capital Employed in the business.

Post bonus price= $\frac{S \times P_0}{S + N}$

Where, S= Number of shares outstanding before bonus issue.

P_0= Current Market Price

N =No. of Bonus Shares issued.

STOCK SPLIT:

Meaning: Stock split represents reduction in the Face Value of Shares.

Implications: Reduction of Market Price per Share, and thereby within the reach of small investor. **Example:** A 3 for 1 Stock Split means that 3 Shares are given for every 1 Share held.

REVERSE SPLIT:

Meaning: Reverse Split is the opposite of Stock Split, i.e. Consolidation of Shares.

Implication: A Reverse Split reduces the number of shares outstanding and increases the Market Price per Share.

Reasons:

a) Company may believe that the higher Stock Price will make the Company better and thus more Investors will purchase the Stock, and Stock Price will also rise as a result.

b) Small cap stocks which can generate better earnings, receive benefit from a Reverse Split.

Example: A 10 Share is increased to 20. Such a split is referred to as 1:2 Split, since a Shareholder gets 1 Share for every 2 Share held.

PROBLEM NO 13: **(PRINTED SOLUTION AVAILABLE)** X ltd has 1000 shares of Rs.10 each raised at a premium of Rs.15 per share. The company's retained earnings are Rs.5,52,500. The company's stock sells for Rs.20 per share.

i) If a 10% stock dividend is declared how many new shares would be issued?

ii) What would be the market price after the stock dividend?

iii) How would the equity account change?

iv) If a 25% stock dividend is declared what changes will take place?

v) If the company instead declares a 5:1 stock split, how many shares will be outstanding? What would be the new par value? What would be the new market price?

vi) If the company declares a 1:4 reverse split, how many shares will be outstanding? What would be the new par value? What would be the new market price?

vii) If the company declares a dividend of Rs.2 per share and the stock goes ex dividend tomorrow, what will be the price at which it will sell?

(C) (ANS.: (I) NEW SHARES - 100 SHARES, (II) MARKET PRICE - RS.18.18, (III) RS.1,000 WOULD BE TRANSFERRED FROM RETAINED EARNINGS TO EQUITY SHARE CAPITAL, (IV) NEW P_0 = 16, RS.2,500 WOULD BE TRANSFERRED FROM RETAINED EARNINGS TO EQUITY SHARE CAPITAL, (V) NEW P_0 = RS.4, (VI) NEW P_0 = RS.80, (VII) TMP = RS.18.)

(SOLVE PROBLEM NO.14 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: ____________________

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?

(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 = 24%)

PROBLEM NO 7: The following information is given for QB Ltd.

Earning per share	Rs.12
Dividend per share	Rs.3
Cost of capital	18%
Internal Rate of Return on investment	22%
Retention Ratio	40%

Calculate the market price per share using

i) Gordon's formula

ii) Walter's formula. ***(A) (CA FINAL OLD PM, SIMILAR: MTP1 M19 (N)) (ANS.: (I) P_0 = RS.78.26, (II) E = RS.77.77)***

MODEL 3: GRAHAM & DODD

PROBLEM NO 8: The following information regarding the equity shares of V ltd. is given:

Market price	Rs.116.66
Dividend per share	Rs.10
Multiplier	7

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

(C) (NEW SM) (ANS.: P: RS.40)

MODEL 4: LINTNER'S MODEL

PROBLEM NO 9: The target payout ratio for Hygenic Ltd. is 0.4.The dividend per share for the current year is Rs.28. The dividend per share in the previous year was Rs.24. The weightage given to the current year earnings is 0.6. The number of Equity Shares outstanding in the company is 5,00,000. If P/E multiple is 9, applying Linter Model of dividend policy to the company, compute the market capitalization of the company. ***(C) (ANS.: MARKET CAPITALIZATION: RS. 34,50,00,000)***

MODEL 5: MODIGLIANI AND MILLER MODEL

PROBLEM NO 10: 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 11: 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)

PROBLEM NO 12: X company earns Rs. 5 per share, is capitalised at a rate of 10 per cent and has a rate of return on investment of 18 per cent.

a) According to Walter's model, What should be the Price per share at 25 percent dividend payout ratio? Is this the Optimum payout ratio according to Walter?

b) Omega company has a cost of equity capital of 10 percent, the current market value of the firm (V) is Rs. 20,00,000 (@ Rs. 20 per share). Assume values for I (new investment), Y (earnings) and D (dividends) at the end of the year as I = Rs.6,80,000 , Y = Rs.1,50,000 and D = Re.1 per share. Show that under the MM assumptions, the payment of dividend does not affect the value of the firm. ***(B) (M.Y.K & P.K.J)***

(ANS.: A) RS. 80; B) WHEN DIVIDENDS ARE PAID: I) P_1 : RS.21, II) RS. 6,30,000, III) 30,000 SHARES, IV) RS.20,00,000; WHEN DIVIDENDS ARE NOT PAID: I) P_1 : RS. 22, II) RS.5,30,000, III) 24,091 SHARES, IV) RS. 20,00,000; DIVIDENDS DOES NOT AFFECT THE VALUE OF THE FIRM)

MODEL 6: BUY BACK OR STOCK REPURCHASE

PROBLEM NO 13: 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)

MODEL 7: BONUS SHARES,STOCK SPLIT & REVERSE SPLIT

PROBLEM NO 14: The balance sheet of K Ltd shows that its shares have a par value of Rs.8. The, paid up capital is Rs. 20 lakhs. The share premium shows Rs.16 lakhs and the retained earnings are Rs. 84 lakhs. The current market price is Rs.60.What will happen to the equity account and to the number of shares outstanding and to the market price in each of the following situations? Consider each situation independently and discuss

i) If there is a 1:5 bonus issue

ii) If there is 2:1 stock split.

iii) If there is a 1:2 reverse split.

(C) (ANS.: (I) NEW P_0 - RS.50 PER SHARE, (II) NEW P_0 = RS.30 PER SHARE, (III) NEW P_0 = RS.120 PER SHARE)

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 1, 2, 10, 11, 13

PROBLEM NO: 1

1. Firm value under Walter's model

Value of the firm (P_0)= $\dfrac{D + \lfloor (E - D) \times (r \div K_{e)} \rfloor}{k_e}$

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

Payout ratio is	**Dividend (earnings Rs.200cr × payout ratio)**	**Computation** $[D + \{(E\text{-}D) \times (\frac{r}{K_e})\}] \div K_e$	**Firm value**
20%	Rs.200cr × 20% = Rs.40cr	$\frac{40+\{(200-40)\times(15\%\div12\%)\}}{12\%} = \frac{40+\{160\times1.25\}}{12\%} = \frac{40+200}{12\%} = \frac{Rs.240cr}{12\%}$	**Rs.2000.00 crores**
40%	Rs.200cr × 40% = Rs.80cr	$\frac{80+\{(200-80)\times(15\%\div12\%)\}}{12\%} = \frac{80+\{120\times1.25\}}{12\%} = \frac{80+150}{12\%} = \frac{Rs.230cr}{12\%}$	**Rs.1916.67 crores**
60%	Rs.200cr × 60% = Rs.120cr	$\frac{120+\{(200-120)\times(15\%\div12\%)\}}{12\%} = \frac{120+\{80\times1.25\}}{12\%} = \frac{120+100}{12\%} = \frac{Rs.220cr}{12\%}$	**Rs.1833.33 crores**
80%	Rs.200cr × 80% = Rs.160cr	$\frac{160+\{(200-160)\times(15\%\div12\%)\}}{12\%} = \frac{160+\{40\times1.25\}}{12\%} = \frac{160+50}{12\%} = \frac{Rs.210cr}{12\%}$	**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 firm 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:

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

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

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

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

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

PROBLEM NO: 10

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

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

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

PROBLEM NO: 11

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	Case 2 – When dividends are not paid
Step 1 $P_0 = \frac{P_1 + D_1}{1+K_e}$	**Step 1** $P_0 = \frac{P_1 + D_1}{1+K_e}$

<table>
<tr><td colspan="2">$100 = \frac{P_1 + 5}{1 + 0.10}$
$P_1 = 110 - 5 = 105$

Step 2
Calculation of funds required for investment:</td><td colspan="2">$100 = \frac{P_1 + 0}{1 + 0.10}$
$P_1 = 110 - 0 = 110$

Step 2
Calculation of funds required for investment:</td></tr>
<tr><td>Earnings</td><td>2,50,000</td><td>Earnings</td><td>2,50,000</td></tr>
<tr><td>Dividend Distributed</td><td>1,25,000</td><td>Dividend Distributed</td><td>NIL</td></tr>
<tr><td>Retained Earnings</td><td>1,25,000</td><td>Retained Earnings</td><td>2,50,000</td></tr>
<tr><td>Total Amount require for Investment</td><td>5,00,000</td><td>Total Amount required for Investment</td><td>5,00,000</td></tr>
<tr><td>Retained Earnings</td><td>1,25,000</td><td>Retained Earnings</td><td>2,50,000</td></tr>
<tr><td>Balance funds required through fresh issue</td><td>3,75,000</td><td>Balance funds required through fresh issue</td><td>2,50,000</td></tr>
<tr><td colspan="2">**Step 3**
No. of shares required to be issued for balance fund
No of shares = $\frac{\text{funds required}}{\text{price at the end}(P_1)}$
$\Delta n = \frac{375000}{105} = 3{,}571.4285$</td><td colspan="2">**Step 3**
No. of shares required to be issued for balance fund
No of shares = $\frac{\text{funds required}}{\text{price at the end}(P_1)}$
$\Delta n = \frac{250000}{110} = 2{,}272.73$</td></tr>
<tr><td colspan="2">**Step 4**</td><td colspan="2">**Step 4**</td></tr>
<tr><td colspan="2">**Calculation of value of firm**</td><td colspan="2">**Calculation of value of firm**</td></tr>
<tr><td colspan="2">$V_f = \frac{(n + \Delta n)P - I + E}{1 + K_e}$
$V_f = \frac{\left(25000 + \frac{375000}{105}\right)105 - 500000 + 250000}{(1 + 0.10)}$
= Rs.25,00,000</td><td colspan="2">$V_f = \frac{(n + \Delta n)P - I + E}{1 + K_e}$
$V_f = \frac{\left(25000 + \frac{250000}{110}\right)110 - 500000 + 250000}{(1 + 0.10)}$
= Rs.25,00,000</td></tr>
</table>

PROBLEM NO: 13

i) Declaration of 10% stock dividend means a 1:10 bonus issue

Number of new share to be issued

$= 1000 \times \frac{1}{10} = 100$ shares.

ii) Market price after stock dividend

$$\frac{S \times P_0}{S + N} = \frac{1000 \times 20}{1100} = \text{Rs.}18.18$$

iii) Change in equity account: an amount of Rs.1000 (100 × 10) would be transferred from retained earnings to equity share capital.

iv) 25% stock dividend: A 25% stock dividend means a 1:4 bonus issue.

a) Number of new shares to be issued $1000 \times \frac{1}{4} = 250$ shares.

b) New $P_0 = \frac{S \times P_0}{S + N} = \frac{1000 \times 20}{1000 + 250} = \text{Rs.}16$

c) An amount of Rs.2500 (10 × 250) would be transferred from retained earnings to equity share capital.

v) 5:1 stock split: A 5:1 stock split means 5 shares are issued in lieu of 1 held.

a) New number of shares $= \frac{\text{Old No. of shares} \times \text{Old face value}}{\text{New face value}}$

(i.e.) $\frac{1000 \times 10}{2} = 5000$ shares

b) New par value = Rs.2 (since 5 share is given for every 1 shares held. Face value goes down from Rs.10 to Rs.2).

c) New P_0 = $\frac{\text{Old}P_0 \times \text{Old number of shares}}{\text{New number of shares}}$ $(i.e) \frac{20 \times 1000}{5000} = Rs.4$

vi) 1:4 reverse split

(a) New par value = Rs.40 (since 1 share is given for every 4 shares held. Face value goes up from Rs.10 to Rs.40).

(b) Nos. of shares = $\frac{1000 \times 10}{40} = 250 \text{shares}$

(c) New P_0 = $\frac{1000 \times 20}{250} = Rs.80$

vii) Dividend declared = Rs.2

From the ex-dividend date, the TMP of the share is the MP of the share a reduced by the dividend declared. (i.e.) TMP= Rs.20 – Rs.2 = Rs.18.

THE END