CA INTER / GR. 2 / FINANCIAL MANAGEMENT – 42.5E (2nd Version)

CHAPTER INCLUDED – COST OF CAPITAL

(APPLICABLE TO MAY 2020 ATTEMPT OF CA INTER. SYNCHRONISED WITH JULY 2019 EDITION OF ICAI SM. ISSUED ON 13/12/19)

4. COST OF CAPITAL

NO. OF PROBLEMS IN 42E OF CA INTER: CLASSROOM – 26 , ASSIGNMENT – 26

NO.OF PROBLEM IN 42.5E OF CA INTER : CLASSROOM – 18, ASSIGNMENT – 18

NO.OF PROBLEM IN 42.5(2nd) OF CA INTER : CLASSROOM –18, ASSIGNMENT – 17

MODEL - WISE ANALYSIS OF PREVIOUS EXAMINATIONS OF IPCC AND CA INTER

Model No.	M-09	N-09	M-10	N-10	M-11	N-11	M-12	N-12	M-13 TO N-13	M-14	N-14	M-15	N-15	M-16	N-16	M-17	N-17	M-18(O)	M-18(N)	N-18(O)	N-18(N)	M-19(O)	M-19(N)	N-19(O)	N-19(N)
1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.2	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-	-	-	-	-	-
1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.2	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.1.2	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-	-	-	-	-	-
3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.1	-	-		-	-	-	-	-	-	5		-	-	-	4	-	-	-	-	-	-	5	5	-	-
5.2	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	8	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-		-	8	-	-	-	-	-	-	-	-	-	-	-	5	10
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SIGNIFICANCE OF EACH PROBLEM COVERED IN THIS MATERIAL

Problem No. in this material	Problem No. in NEW SM	Problem No. in OLD SM	Problem No. in OLD PM	RTP	MTP	Previous Exams	Remarks
CR 1	-	-	-	-	-	-	TN
CR 2	-	-	-	-	-		-
CR 3	-	-	-	-	-	-	-
CR 4	-	-	-	N16	-	-	-
CR 5	EX (4.11)	EX (4.10)	-	-	-	-	-
CR 6	-	-	-	-	-	-	TN
CR 7	ILL-5	ILL-5	-	-	-	-	
CR 8	-	-	-	-	-	-	
CR 9	-	-	-	-	-	-	
CR 10	-	-	-	M17 (100%)	-	-	
CR 11	-	-	-	-	-	-	
CR 12	-	-	-	-	-	-	TN
CR 13	-	-	-	-	-	-	
CR 14	-	-	2	-	-	-	
CR 15	-	-	7	-	-	-	
CR 16	-	-	-	-	-	M19(O)	
CR 17	-	-	-	-	N18 (O)	N18 (O)	

CR 18	ILL-14	ILL-15	-	-	-	-	
ASG 1	-	-	-	-	-	-	
ASG 2	-	-	-	-	-	-	
ASG 3	-	-	-	-	-	-	
ASG 4	-	-	-	-	-	-	
ASG 5	-	-	-	-	-	-	RG
ASG 6	-	-	-	-	-	-	
ASG 7	-	-	-	-	-	M13 - 5M	
ASG 8	-	-	-	-	-	-	
ASG 9	-	-	-	-	-	-	
ASG 10	-	-	-	-	-	-	
ASG 11	-	-	-	-	-	-	TN
ASG 12	-	-	-	-	-	-	
ASG 13	-	-	-	-	-	M18 (O) - 5M	
ASG 14	-	-	5	-	-	-	
ASG 15	-	-	11	-	-	-	
ASG 16	-	-	-	-	-	-	PN
ASG 17	-	-	-	-	-	-	RK

MEANING OF COST OF CAPITAL:

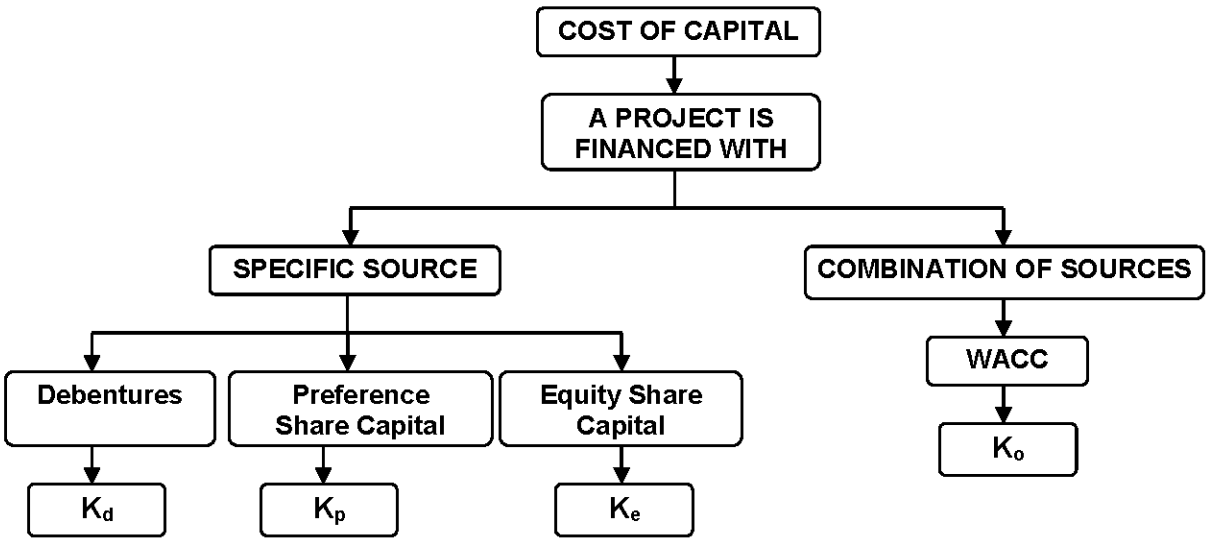
- Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt- holders) to the business as a compensation for their contribution to the total capital. In other words it is the minimum rate of return expected by the providers of finance.
- It is expressed as a rate and used to discount/ compound the cash flow or stream of cash flows.
- Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc.

SIGNIFICANCE OF COST OF CAPITAL:

The cost of capital is important to arrive at correct amount and helps the management or an investor to take an appropriate decision. The correct cost of capital helps decision making in the following ways:

- Evaluation of investment options
- Performance Appraisal
- Designing of optimum credit policy

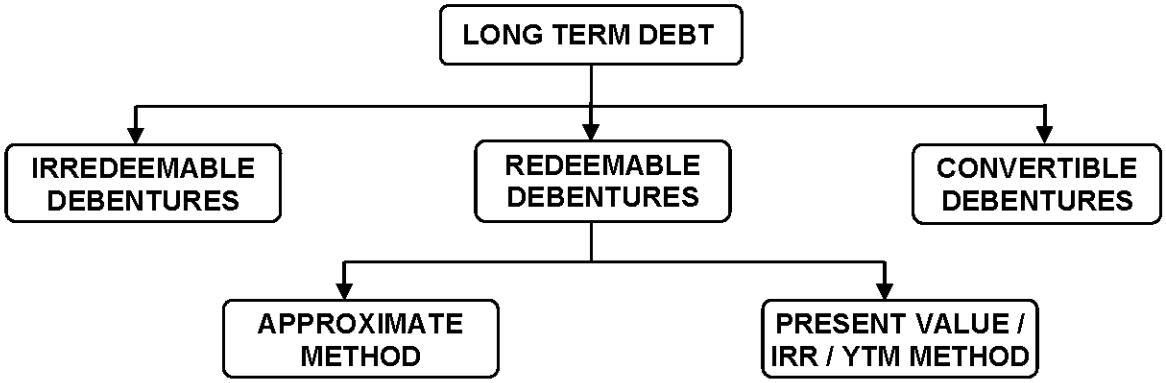
DETERMINATION OF THE COST OF CAPITAL



FLOATATION COST: The new issue of a security (debt or equity) involves some expenditure in the form of underwriting or brokerage fees, legal and administrative charges, registration fees, printing expenses etc. The sum of all these costs is known as floatation cost. This expenditure is incurred to make the securities available to the investors. Floatation cost is adjusted to arrive at net proceeds for the calculation of cost of capital.

MODEL 1: COST OF LONG TERM DEBT

- Long term debt includes long term loans from financial institutions, capital from issuing debentures or bonds etc.
- External borrowings or debt instruments do not confer ownership to the providers of finance. The providers of debt fund do not participate in the affairs of the company but enjoys the charge on the profit before taxes.



MODEL 1.1: COST OF IRREDEEMABLE DEBENTURES:

The cost of debentures which are not redeemed by the issuer of the debenture is known as irredeemable debentures. Cost of debentures not redeemable during the life time of the company is calculated as below:

$$\text{Cost of Irredeemable Debenture } (K_d) = \frac{I}{NP}(1-t)$$

Where,

K_d = Cost of debt after tax

I = Annual interest payment

NP = Net proceeds of debentures or current market price

t = Tax rate

PROBLEM NO 1: XYZ Ltd. Issued Rs.100 Lakhs 12% Debentures of Rs.100 each. Calculate the cost of debt in each of the following cases. (Assume corporate tax being 40%).

Case (a) If Debentures are issued at par with no floatation cost.

Case (b) If Debentures are issued at 10% premium with floatation cost are 5% of issue price.

Case (c) If Debentures are issued at 10% discount with floatation cost are 5% of issue price.

(A) (TN) (ANS: (A) 7.20%, (b) 6.89%, (c) 8.42%) (SOLVE PROBLEM NO. 1 OF ASSIGNMENT PROBLEMS AS REWORK).

Note:_____

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MODEL 1.2: COST OF REDEEMABLE DEBENTURES:

The cost of debentures which are redeemed by the issuer of the debenture is known as redeemable debentures. Redemption may be done either in lump sum or in instalments.

The Cost of Redeemable debts can be ascertained under the following methods

A. Approximate Method.

B. Present value method / Internal Rate of Return (IRR) / Yield to Maturity (YTM).

a) APPROXIMATE METHOD:

$$\text{Cost of Redeemable Debenture } (K_d) = \frac{I(1-t)+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

Where,

I = Interest payment

NP = Net proceeds from debentures in case of new issue of debt or Current Market price in case of existing debt.

RV = Redemption value of debentures

T = Tax rate applicable to the company

n = Life of debentures.

NOTE:

The above formula shall apply subject to the following conditions:

- The principal amount must be repaid at the time of maturity.
- No change in interest rate during the term of Debenture / Bond.

If any one of the above conditions is not satisfied, then cost of redeemable debt should be ascertained by present value method / IRR / YTM.

PROBLEM NO 2: Calculate the explicit cost of debt for each of the following situations:

A. Debentures are sold at a premium of 10% and floatation costs are 5% of issue price.

B. Debentures are sold at a discount of 5% and flotation costs are 5% of issue price.

Assume: (i) Face value of debentures is Rs. 100; (ii) Maturity period is 10 years (iv) Tax rate is 35%.
(A. 9.10%, B. 11.27%)

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

Note:_____

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PROBLEM NO 3: (PRINTED SOLUTION AVAILABLE)

A. A company's debentures of the face value of Rs.100 bear 8% coupon rate. Debentures of this type currently yield 10%. What is the market price of debentures of the company?

B. What would happen to the market price of debentures if interest rate on debentures rises to (i) 16% & (ii) drops to 12%?

C. What would be the market price of debentures in situation (a) if it is assumed that debentures were originally having 15 year maturity period & maturity period is 4 years away from now?

D. Would you pay Rs.90 to purchase debentures specified in situation (c)? Explain.

(A) (ANS.: A. 80, B. 160,120, C. 93.66, D. ADVISABLE TO PURCHASE THE GIVEN DEBENTURES)

(SOLVE PROBLEM NO 3 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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PRESENT VALUE METHOD / INTERNAL RATE OF RETURN (IRR) / YIELD TO MATURITY (YTM):

- The cost of redeemable debt (K_d) is also calculated by discounting the relevant cashflows using Internal rate of return (IRR) (The concept of IRR is discussed in the Chapter- Investment Decisions).
- Here YTM is the annual return of an investment from the current date till maturity date. So, YTM is the internal rate of return at which current price of a debt equals to the present value of all cashflows.

$$IRR = L + \frac{NPV_L}{NPV_L - NPV_H}(H - L)$$

Where,

L = Lower

H = Higher

PROBLEM NO 4: A company has issued 15% debentures aggregating Rs.1,00,000. The flotation cost is 15%. The company has agreed to repay the debentures at par in 5 equal annual instalments starting at the end of year 1. The rate of tax is 35%. Find cost of debt?

PV Factor	1 Year	2 Year	3Year	4 Year	5Year	6Year	7 Year	8 Year	9Year	10 Year
15%	0.869	0.756	0.657	0.571	0.497	0.432	0.375	0.326	0.284	0.247
18%	0.847	0.718	0.608	0.515	0.437	0.370	0.313	0.266	0.225	0.191

(A) (RTP N16) (ANS.: 16.82%) (SOLVE PROBLEM NO. 4 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 1.3: COST OF CONVERTIBLE DEBENTURE:

- Holders of convertible debentures have the option to either get the debentures redeemed into cash or get specified number of company's shares in lieu of cash.
- The calculation of cost of convertible debentures is very much similar to that of redeemable debentures.
- While determining the redeemable value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly it is considered to calculate cost of debt.

PROBLEM NO 5: A company issued 10,000, 15% Convertible debentures of Rs.100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is Rs.12 each and historically the growth rate of the shares are 5% per annum. Compute the cost of debentures assuming 35% tax rate. *(B) (NEW SM, OLD SM)*

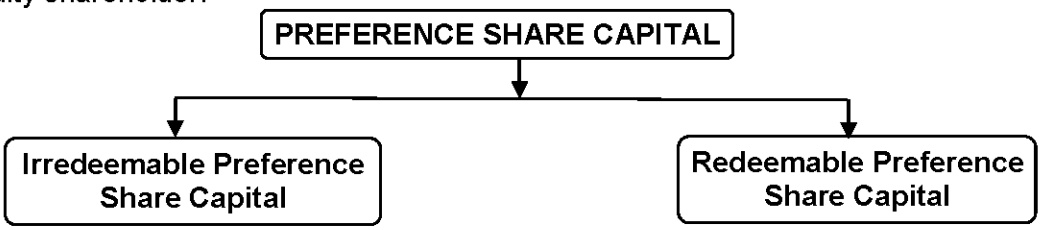
(ANS: USING APPROXIMATE METHOD 16.09% OR IRR METHOD 17.43%)

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

Note:_____

MODEL 2: COST OF PREFERENCE SHARE CAPITAL

- The Preference share capital is paid dividend at a specified rate on face value of preference shares.
- The payment of dividend to the preference shareholders is not charged as expenses but treated as appropriation of after tax profit. Hence, dividend paid to preference shareholders does not reduce the tax liability to the company.
- Payment of dividend to the preference shareholders are not mandatory but are given priority over the equity shareholder.



MODEL 2.1: COST OF IRREDEEMABLE PREFERENCE SHARES:

- The cost of irredeemable preference shares is similar to calculation of perpetuity.
- The cost is calculated by dividing the preference dividend with the current market price or net proceeds from the issue.

- The cost of irredeemable preference share is as below:

$$\text{Cost of Irredeemable Preference Share } (K_P) = \frac{PD}{P_0}$$

Where,

PD = Annual preference dividend

P_0 = Net proceeds in issue of preference shares

PROBLEM NO 6:

A Ltd Issued Rs.100 Lakhs 12% Preference shares of Rs. 100 each. Calculate the cost of preference share in each of the following cases. (Assume dividend tax rate being 20%)..

Case (a) If Preference shares are issued at par with 5% floatation cost.

Case (b) If Preference shares are issued at 10% premium with 5% floatation cost.

Case (c) If Preference shares are issued at 10% discount with 5% floatation cost. *(A) (TN)*

(ANS: a)15.16%, b) 13.78%, c) 16.84%) (SOLVE PROBLEM NO.6 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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MODEL 2.2: COST OF REDEEMABLE PREFERENCE CAPITAL:

- Preference shares issued by a company which are redeemed on its maturity is called redeemable preference shares.
- Cost of redeemable preference share is similar to the cost of redeemable debentures with the exception that the dividends paid to the preference shareholders are not tax deductible.
- Cost of preference capital is calculated as follows:

$$\text{Cost of Redeemable Preference Share } (K_p) = \frac{PD + \frac{RV - NP}{n}}{\frac{(RV + NP)}{2}}$$

Where,

PD = Annual preference dividend

RV = Redemption value of preference shares

NP = Net proceeds on issue of preference shares

n = Life of preference shares.

The above formula shall apply subject to the following conditions:

- The principal amount must be repaid at the time of maturity.
- No change in Dividend rate during the term of Debenture / Bond.

If any one of the above conditions is not satisfied, then cost of redeemable debt should be ascertained by Present Value method / IRR / YTM.

PROBLEM NO 7: XYZ Ltd. issues 2,000 10% preference shares of Rs.100 each at Rs. 95 each. The company proposes to redeem the preference shares at the end of 10th year from the date of issue. Calculate the cost of preference share? *(A) (NEW SM, OLD SM) (ANS.: 10.77%)*

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

Note:_____

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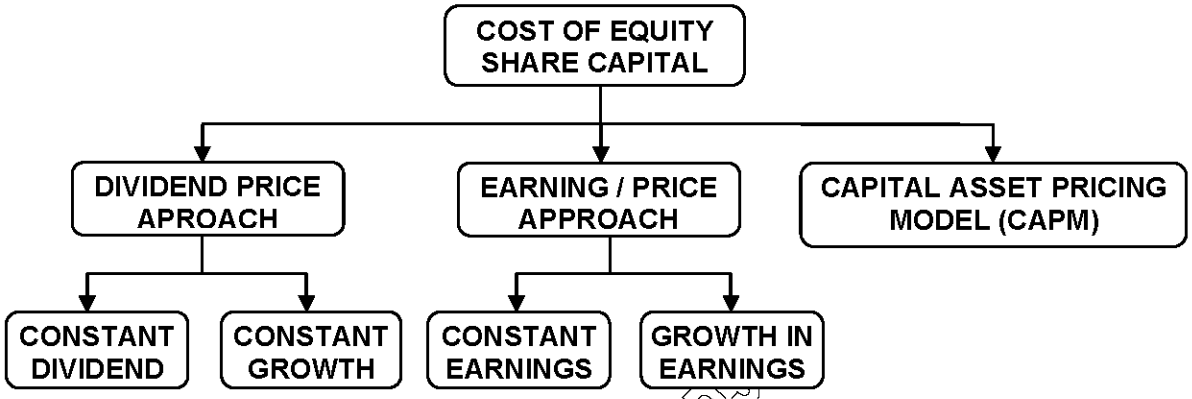
MODEL 3: COST OF EQUITY SHARE CAPITAL

- The equity shareholders are the owners of the company. The main objective of the firm is to maximize wealth of the equity shareholders.
- Equity share capital is the risk capital of the company.
- If the company's business is doing well the ultimate beneficiaries are the equity shareholders who will get return in the form of dividends from the company and the capital appreciation for their investment.
- If the company comes for liquidation due to losses, the ultimate and worst sufferers are the equity shareholders.
- The cost of equity may be defined as minimum rate of return that a company must earn on the equity financed portion of an investment project so that market price of the shares remains unchanged.



MODEL 3.1: DIVIDEND PRICE APPROACH:

- This is also known as Dividend Valuation Model.
- This model makes an assumption that the market price of a share is the present value of its future dividends stream.
- As per this approach the cost of equity is the rate which equates the future dividends to the current market price.

Here, cost of equity capital is computed by dividing the expected dividend by market price per share

MODEL3.1.1: DIVIDEND PRICE APPROACH WITH CONSTANT DIVIDEND:

In this approach dividend is constant, which means there is no-growth or zero growth in dividend. The cost of equity can be calculated as follows:

$$\text{Cost of Equity } (K_e) = \frac{D}{P_0}$$

Where,

K_e = Cost of equity

D = Expected dividend

P_0 = Market price of equity (ex- dividend)

This model assumes that dividends are paid at a constant rate to perpetuity. It ignores taxation.

PROBLEM NO 8: Mahindra is a shareholder in the Central India Ltd. Although earnings for Central have varied considerably, Mahendra has determined that the long run average dividends for the firm have been Rs.2 per share. He expects a similar pattern to prevail in the future. Given the volatility of Central's dividends, Mahendra has decided that a minimum rate of 20% should be earned on this share. What price would Mahendra be willing to pay for Central's Shares? *(A) (ANS.: RS.10)*

(SOLVE PROBLEM NO. 8 OF ASSIGNMENT PROBLEMS AS REWORK)

MODEL 3.1.2: DIVIDEND PRICE APPROACH WITH CONSTANT GROWTH:

As per this approach the rate of dividend growth remains constant. Where earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

$$\text{Cost of Equity } (K_e) = \frac{D_1}{P_0} + g$$

Where,

D_1 = $[D_0 (1+ g)]$ i.e. next expected dividend

P_0 = Current Market price per share

g = Constant Growth Rate of Dividend.

In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

$$\text{Cost of Equity } (K_e) = \frac{D_1}{P_0} + g$$

PROBLEM NO 9: Investors require 12% rate of return on equity shares of company Y. What would be the market price of the share if the previous dividend (Do) was Rs.2 and investors expect dividends to grow at a constant rate of (a) 4% (b) 0% (c) - 4% (d) 11%.

(B) (ANS: (A) RS. 26, (B) RS. 16.66, (C) RS.12 (D) RS. 222)

(SOLVE PROBLEM NO 9 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

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PROBLEM NO 10: (PRINTED SOLUTION AVAILABLE) XYZ Ltd. is currently earning a profit after tax of Rs.25,00,000 and its shares are quoted in the market at Rs.450 per share. The company has 1,00,000 shares outstanding and has no debt in its capital structure. It is expected that the same level of earnings will be maintained for future years also. The company has 100 per cent pay-out policy.

Required:

A. Calculated the Cost of equity

B. If the company's pay-out ratio is assumed to be 70% and it earns 20% rate of return on its investment, then what would be the firm's cost of equity?

Ans;(a)0.055or 5.55% (b) 0.0988 or 9.89% (SOLVE PROBLEM NO 10 OF ASSIGNMENT PROBLEMS AS REWORK)

(A) (RTP M17)

Note:_____

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MODEL 3.2: EARNING / PRICE APPROACH:

- The advocates of this approach co-relate the earnings of the company with the market price of its share.
- Accordingly, the cost of equity share capital would be based upon the expected rate of earnings of a company.
- The argument is that each investor expects a certain amount of earnings, whether distributed or not from the company in whose shares he invests.

MODEL 3.2.1: EARNINGS / PRICE APPROACH WITH CONSTANT EARNINGS:

$$\text{Cost of Equity } (K_e) = \frac{E}{P}$$

Where,

E = Current earnings per share

P = Market share price

Since practically earnings do not remain constant and the price of equity shares is also directly influenced by the growth rate in earnings. The above formula needs to be modified to reflect the growth element.

PROBLEM NO 11 The Xavier Corporation, a dynamic growth firm, anticipates long-run level of future earning of Rs.7 per share. The current price of Xavier's shares is Rs. 55.45, floatation costs for the sale of equity shares would average about 10% of the price of the shares. What is the cost of new equity capital to Xavier? *(B) (ANS.: 14.02%) (SOLVE PROBLEM NO 11 OF ASSIGNMENT PROBLEMS AS REWORK)*

Note:_____

MODEL 3.2.2 EARNINGS / PRICE APPROACH WITH GROWTH IN EARNINGS:

$$\text{Cost of Equity } (K_e) = \frac{E}{P} + g$$

Where,

E = Current earnings per share

P = Market price per share

g = Annual growth rate of earnings.

The Earning Price Approach is similar to the dividend price approach; only it seeks to nullify the effect of changes in the dividend policy.

PROBLEM NO 12: From the following information, calculate cost of equity (K_e) according to (a) Earning Price ratio approach (b) Earning price plus growth approach.

1. Current Market Price of an Equity share : Rs.100
2. Expected Earnings per Share at the end of year: Rs. 10
3. Growth Rate: 6%. *(C) (TN) (ANS: A) 10%, B) 16%) (SOLVE PROBLEM NO. 12 OF ASSIGNMENT PROBLEMS AS REWORK)*

Note:_____

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MODEL 3.3: CAPITAL ASSET PRICING MODEL (CAPM) APPROACH:

CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return for securities.

The risks, to which a security is exposed, can be classified into two groups:

i) **Unsystematic Risk:** This is also called company specific risk as the risk is related with the company's performance. This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk.

ii) **Systematic Risk:** It is the macro-economic or market specific risk under which a company operates. This type of risk cannot be eliminated by diversification. Hence, it is non-diversifiable. The examples are inflation, Government policy, interest rate etc.

$$\text{Cost of Equity } (K_e) = R_f + ß\,(R_m - R_f)$$

Where,

K_e = Cost of equity capital

R_f = Risk free rate of return

ß = Beta coefficient

R_m = Rate of return on market portfolio

$(R_m - R_f)$ = Market premium

PROBLEM NO 13: The beta coefficient of Target Ltd is 1.4. The company has been maintaining 8% rate of growth in dividends and earnings. The last dividend paid was Rs.4 per share. The return on government securities is 10 per cent while the return on market portfolio is 15 per cent. The current market price of one share of Target Ltd. is Rs.36.

A. What will be the equilibrium price per share of Target Ltd?

B. Would you advise purchasing the share? *(A) (ANS.: A. RS.48, B. YES)*

(SOLVE PROBLEM NO 13 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 4: COST OF RETAINED EARNINGS

- Like any other source of fund, retained earnings involve cost. It is the opportunity cost of dividends foregone by shareholders.
- A company can either keep or reinvest cash or return it to the shareholders as dividends. If the cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.
- The cost of retained earnings is often used interchangeably with the cost of equity, as cost of retained earnings is nothing but the expected return of the shareholders from the investment in shares of the company.
- However, sometime cost of retained earnings remains below the cost of equity due to saving in floatation cost and existence of personal tax.

The Cost of Retained Earnings (K_s) is calculated as below:

In absence of any information on personal tax (t_p):

Cost of Retained Earnings (K_s) = Cost of Equity Shares (K_e)

If there is any information on personal tax (t_p):

$$K_s = K_e - t_p$$

PROBLEM NO 14: Y Ltd. retains Rs.7,50,000 out of its current earnings. The expected rate of return to the shareholders, if they had invested the funds elsewhere is 10%. The brokerage is 3% and the shareholders come in 30% tax bracket. Calculate the cost of retained earnings. *(B) (OLD PM) (ANS.: 6.79%)*

(SOLVE PROBLEM NO 14 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

MODEL 5: WEIGHTED AVERAGE COST OF CAPITAL (WACC)

- WACC is also known as overall cost of capital of having capitals from the different sources
- WACC of a company depends on the capital structure of a company.
- It weighs the cost of capital of a particular source of capital with its proportion to the total capital.
- Thus, weighted average cost of capital is the weighted average after tax cost of individual components of firm's capital structure.

The steps to calculate WACC is as follows:

Step 1: Calculate the total capital from all the sources.

(i.e. Long term debt capital + Pref. Share Capital + Equity Share Capital + Retained Earnings)

Step 2: Calculate the proportion (or %) of each source of capital to the total capital.

$$\left(\text{i.e.}\frac{\text{Eqity share capital (for example)}}{\text{Total capital (as calculated in step 1 above)}}\right)$$

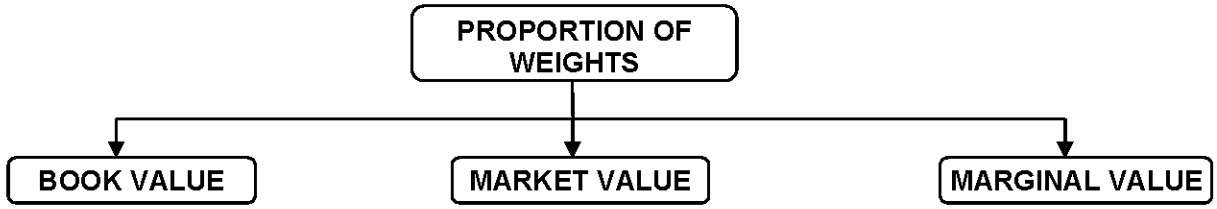
Step 3: Multiply the proportion as calculated in Step 2 above with the respective cost of capital.

(i.e. K_e × Proportion (%) of equity share capital (for example) calculated in Step 2 above)

Step 4: Aggregate the cost of capital as calculated in Step 3 above. This is the WACC.

(i.e. $K_e + K_d + K_p + Ks$ as calculated in Step 3 above)

CHOICE OF WEIGHTS: The weights of different sources can be ascertained using book value approach and market value approach.



MODEL 5.1: BOOK VALUE (BV):

Book value weights are operationally easy and convenient.

- While using BV, reserves such as share premium and retained profits are included in the BV of equity, in addition to the nominal value of share capital.
- Here the value of equity will generally not reflect historic asset values, as well as the future prospects of an organisation.

PROBLEM NO 15: TA Ltd has the following capital structure:

Particulars	Amount (Rs.)
Equity (2,00,000 shares)	40,00,000
10% preference shares	10,00,000
14% Debentures	30,00,000
	80,00,000

The share of the company sells for Rs.20. It is expected that the company will pay next year a dividend of Rs.2 per share which will grow at 7% forever. Assume a 50% tax rate.

A. Compute the WACC based on existing capital structure.

B. Compute the new WACC if the company raises an additional Rs. 20,00,000 debt by issuing 15% debentures. This would result in increasing the expected dividend to Rs.3 and leave the growth rate unchanged, but the price of the share will fall to Rs.15 per share.

C. Recomputed WACC if growth rate increases to 10%. *(A) (OLD PM, SIMILAR: MTP N18,RTP M19(O)(N))*

(ANS: A. 12.375%, B. 15.4%, C.16.6%) (SOLVE PROBLEM NO 15 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

_____

PROBLEM NO 16:

The capital structure of bright Limited as on 31.03.2019 is as follows:

Particulars	Amount Rs.
Equity share capital: 7,50,000 equity shares of Rs100 each	750
Retained earnings	250
13.5% Preference share capital	240
12.5% Debentures	360

The current market price per equity share is Rs. 350. The prevailing default risk free interest is 6% and rate of return on market portfolio is 15%. The beta of the company is 1.289.

The corporate tax rate is 30%. The average tax rate of shareholders is 25% and brokerage cost is 2% that they have to pay while investing dividends in alternative securities.

Required: Calculate the weighted average cost of capital on the basis of book value weights.

MODEL 5.2: MARKET VALUE (MV):

- Market value weight is more correct and represents a firm's capital structure.
- It is preferable to use MV weights for the equity. While using MV, reserves such as share premium and retained profits are ignored as they are in effect incorporated into the value of equity.

PROBLEM NO 17: (PRINTED SOLUTION AVAILABLE) ABC Limited has the following book value capital structure:

Equity Share Capital (150 million shares, Rs.10 par)	Rs. 1,500 million
Reserves and Surplus	Rs. 2,250 million
10.5% Preference Share Capital (1 million shares, Rs.100 par)	Rs. 100 million
9.5% Debentures (1.5 million debentures, Rs.1,000 par)	Rs. 1,500 million
8.5% Term Loans from Financial Institutions	Rs. 500 million

- The debentures of ABC Limited are redeemable after three years and are quoted at Rs. 981.05 per debenture.
- The current market price per equity share is Rs.60. The prevailing default-risk free interest rate on 10-year GOI Treasury Bonds is 5.5%. The average market risk premium is 8%. The beta of the company is 1.1875.
- The preferred stock of the company is redeemable after 5 years is currently selling at Rs. 98.15 per preference share

The applicable income tax rate for the company is 35%.

Required:

i) Calculate weighted average cost of capital of the company using market value weights.

ii) What would be the marginal cost of capital for ABC Ltd. if it raises Rs.750 million for a new project. The firm plans to have a debt of 20% of the newly raised capital. The beta of new project is 1.4375. The debt capital will be raised through term loans, it will carry interest rate of 9.5% for the first Rs.100 million and 10% for the next Rs. 50 million. ***(A)***

(MTP N18 (O), SIMILAR: N18(O) - 5M) (ANS: (i) 13.455%; (ii)14.8%)

(SOLVE PROBLEM NO 16 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:

MODEL 6: MARGINAL COST OF CAPITAL

- The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as cost incurred in raising new funds.
- Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.
- The marginal weights represent the proportion of funds the firm intends to employ. Thus, the problem of choosing between the book value weights and market value weights does not arise in the case of marginal cost of capital computation.
- To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component costs. Therefore, the marginal cost of capital should be calculated in the composite sense.

PROBLEM NO 18: (PRINTED SOLUTION AVAILABLE) ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2017.

Rs.

14% Debentures	30,000
11% Preference shares	10,000
Equity Shares (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of Rs 23.60. Next year dividend per share is 50% of year 2017 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (Rs.)	Year	EPS (Rs.)
2008	1.00	2013	1.61
2009	1.10	2014	1.77
2010	1.21	2015	1.95
2011	1.33	2016	2.15
2012	1.46	2017	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is Rs 96.

Preference share Rs 9.20 (with annual dividend of Rs 1.1 per share) was also issued. The company is in 50% tax bracket.

A. Calculate after tax:

i) Cost of new debt

ii) Cost of new preference shares

iii) New equity share (consuming new equity from retained earnings)

B. Calculate marginal cost of capital when no new shares are issued.

C. How much can be spent for capital investment before new ordinary shares must be sold. Assuming that retained earnings for next year's investment are 50 percent of 2017.

D. What will the marginal cost of capital when the funds exceed the amount calculated in (C), assuming new equity is issued at Rs 20 per share?

(A) (NEW SM, OLD SM SIMILAR:MTP1(O)(N))

(ANS.: A) 1) 0.0833; 2) 0.12; 3) 1.18 B) 0.1385; C) RS. 14,750; D) 0.1457)

(SOLVE PROBLEM NO. 17 OF ASSIGNMENT PROBLEMS AS REWORK)

Note:_____

PRINTED SOLUTIONS TO SOME SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 3,10,17,18

PROBLEM NO.3

A. $NP_0 = \frac{I}{K_i} = \frac{100 * 8\%}{0.1}$ **= Rs.80**

B. $P_0 = \frac{I}{K_i} = \frac{100 * 16\%}{0.1}$ **= Rs.160**

C. Let MP_0 (or) $NP_0 = x$

$$K_i = \frac{I + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} * 100$$

$$0.1 = \frac{8+\frac{100-x}{4}}{\frac{100+x}{2}} * 100$$

$$0.1[\frac{100+x}{2}] = [\frac{32+100-x}{4}]$$

(10+0.1x)2 = 132-x

20+0.2x = 132-x

1.2x = 112

MP_0 (x) = 93.33

INTERNAL RATE OF RETURN

Year	Particulars	CIF	PVF @ 10%	PV
1-4	Interest	8	3.170	25.36
4	R.V	100	0.683	68.3
Market Price (MP_o)				93.66

D. It is advisable to purchase the debentures at Rs.90/- because, Theoretical price is more than the actual price.

[AP < TP] → Buy

[AP > TP] → Sel

PROBLEM NO.10

CALCULATION OF COST OF EQUITY (K_E):

A. Given: Market price= 450, Profit after tax = 25,00,000, No of equity shares =1,00,000

$$EPS = \frac{\text{Equity shares available to shareholders}}{\text{No. of equity shares}}$$

$$= \frac{25,00,000}{1,00,000} = 25$$

$$K_e = \frac{\text{Earning per share}}{\text{Market price}} X100$$

$$= \frac{25}{450} X100$$

K_e= 5.55%

B. Given: Retaining ratio = 30%, Dividend payout ratio = 70%, Re-investment rate = 20%

Growth rate = Retaining ratio x Re-investment rate

Growth rate = 30X20% = 6%

$$K_e = \frac{\text{Dividend payout share}}{\text{Market Price}} + \text{Growth}$$

$$= \left(\frac{25*70\%}{450} + 0.06\right) X100$$

$$= \left(\frac{17.5}{450} + 0.06\right) X100$$

K_e = 9.89%

NOTE: **Dividend payout ratio is always calculated on Earning per share**

PROBLEM NO.17

Working Note:

1. **Computation of cost of debentures (K_d):**

$$K_d = \frac{\text{Interest}(1-t)+\frac{RV-NP}{3\text{years}}}{\frac{RV+NP}{2}} = \frac{95(1-0.35)+\frac{100-981.15}{3\text{Years}}}{\frac{1000+981.05}{2}} =$$

$$= \frac{61.75+\frac{18.95}{3\text{Years}}}{\frac{1981.05}{2}} = 0.0687 \text{ or } 6.87\%$$

2. **Computation of cost of Term loans (K_t):**

= r (1-t) = 0.085(1-0.35) = 0.05525 or 5.525%

3. **Computation of cost of Preference capital (K_p):**

$$K_p = \frac{\text{Preference dividend}+(RV-NP)/n}{(RV+NP)/2} = \frac{10.5+(100-98.15)/5}{100+98.15/2} = 0.1097 = 10.97\%$$

4. **Computation of cost of Equity (K_e):**

= R_f + β (R_m - R_f)

Or = Risk free rate + (Beta x Risk premium)

= 0.055 + (1.1875x0.08) = 0.15 or 15%

i) **Calculation of Weighted Average cost of capital Using market value weights**

Source of capital	Market value of capital structure	Weights	After tax cost of capital	WACC (%)
Equity share capital(150million shares x Rs.60)	9,000	0.813	15,000	12.195
10.5% Preference share capital	98.15	0.0089	10.970	0.098
9.5% Debentures(1.5million x Rs.981.05)	1471.575	0.1329	6.872	0.913
8.5% Trem loans	500	0.0452	5.525	0.249
	11,069.725	1000		13.455

ii) **Marginal cost of capital (MCC):**

New capital of Rs.750 million will be raised in proportion of 20% Debt and 80% equity share capital i.e. Rs.150 million debt and Rs.600 million equity.

Cost of equity shares (Ke) = Risk free rate + (Beta × Risk premium)

= 0.055 + (1.4375 × 0.08) = 0.17 or 17%

Cost of Debt (Kd):

for first Rs.100 million = 9.5%x (1 - 0.35) = 6.175%

for next Rs.50 million = 10%x (1 - 0.35)= 6.5%

$$\text{Marginal Cost of Capital} = 0.17\frac{Rs.600m}{Rs.750m}+(0.06175x\frac{Rs.100m}{Rs.750m}+0.065x\frac{Rs.50m}{Rs.750m})$$

= 0.136 + (0.008 + 0.004) = 0.148 or 14.8%

PROBLEM NO.18

A.

i) Cost of new debt Kd $= \frac{I(1-t)}{P_0} = \frac{16(1-0.5)}{96} = 0.0833$

ii) Cost of new preference shares (K_p) $= \frac{PD}{P_0} = \frac{1.1}{9.2} = 0.12$

iii) Cost of new equity shares (K_e) $= \frac{D}{P_0} + g = \frac{1.18}{23.60} + 0.10 = 0.05 + 0.10 = 0.15$

Calculation of D_1:

D_1 = 50% of 2013 EPS = 50% of 2.36 = Rs. 1.18

B. CALCULATION OF MARGINAL COST OF CAPITAL

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debenture	0.15	0.0833	0.0125
Preference Share	0.05	0.12	0.0060
Equity Share	0.80	0.15	0.1200
Marginal cost of capital			0.1385

C. The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:

Retained earnings = (0.50) (2.36 × 10,000) = Rs. 11,800

The ordinary equity (Retained earnings in this case) is 80% of total capital

11,800 = 80% of Total Capital

Capital investment before issuing equity $= \frac{11,800}{0.80}$ = Rs. 14,750

D. If the company spends in excess of Rs. 14,750 it will have to issue new shares.

Capital investment before issuing equity $= \frac{1.18}{20} + 0.10 = 0.159$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debentures	0.15	0.0833	0.0125
Preference Shares	0.05	0.1200	0.0060
Equity Shares (New)	0.80	0.1590	0.1272
			0.1457

ASSIGNMENT PROBLEMS

MODEL 1.1: COST OF IRREDEEMABLE DEBENTURES

PROBLEM NO 1: XYZ Ltd. Issued Rs.10 Lakhs 15% Debentures of Rs.100 each. Calculate the cost of debt in each of the following cases. (Assume corporate tax being 30%).

Case (a) If Debentures are issued at par with no floatation cost.

Case (b) If Debentures are issued at par with floatation cost are 5% of issue price.

Case (c) If Debentures are issued at 10% premium with floatation cost are 5% of issue price.

Case (d) If Debentures are issued at 10% discount with floatation cost are 5% of issue price.

(A) (ANS: (A) 10.5%, (B) 11.05%, (C) 10.05%, (D) 12.28%)

MODEL 1.2: COST OF REDEEMABLE DEBT

PROBLEM NO 2: Calculate the explicit cost of debt for each of the following situations:

A. Debentures are sold at par and flotation costs are 5%.

B. Debentures are sold at a premium of 10% and floatation costs are 5% of issue price.

C. Debentures are sold at a discount of 5% and flotation costs are 5% of issue price.

Assume: (i) Coupon rate of interest on debentures is 12% (ii) Face value of debentures is Rs. 100; (iii) Maturity period is 10 years (iv) Tax rate is 40%. *(A) (ANS.: A. 7.89%, B.6.669%, C.8.59%)*

PROBLEM NO 3:

A. A company's debentures of the face value of Rs.100 bear 15% coupon rate. Debentures of this type currently yield 12%. What is the market price of debentures of the company?

B. What would happen to the market price of debentures if interest rate on debentures rises to (i) 18% & (ii) drops to 12%?

C. What would be the market price of debentures in situation (a) if it is assumed that debentures were originally having 10 year maturity period & maturity period is 5 years away from now?

D. Would you pay Rs.90 to purchase debentures specified in situation (c)? Explain.

(A) (ANS.: A. 125; B. 150, 100; C. 104.58; D. ADVISABLE TO PURCHASE THE GIVEN DEBENTURES)

MODEL 1.3: COST OF CONVERTIBLE DEBENTURES

PROBLEM NO 4: ABC Ltd. issues 15% debentures of face value of Rs.1000 each at a flotation cost of Rs.100 per debenture. Find out the cost of capital of the debenture which is to be redeemed in 5 annual installments of Rs.200 each starting from the end of year 1. The tax rate is 50%.

(A) (ANS.: NPV @ 10% IS RS. (39.34) & IRR IS 11.79%)

PROBLEM NO 5: XYZ Ltd. has issued 11% Debentures of Rs. 100 each. These are being traded at Rs. 140 per debenture at present. The debentures are convertible into 5 equity shares per debenture. The present market price of the equity shares is Rs. 22 which is expected to increase @ 5% p.a. over next 5 years. Find out the cost of convertible debentures given the tax rate at 30%. *(B) (RG) (ANS.: K_p = 5.5%)*

MODEL 2.1: COST OF IRREDEEMABLE PREFERENCE SHARES

PROBLEM NO 6: A company issues 14% irredeemable preference shares of the face value of Rs.100 each. Floatation costs are estimated at 5% of the expected sale price. (a) What is k_p, if preference shares are issued at (i) Par value, (ii) 10% premium, and (iii) 5% discount?

(B) (ANS.: (I) 14.73%,(II) 13.39%,(III) 15.51%)

MODEL 2.2: COST REDEEMABLE PREFERENCE SHARES

PROBLEM NO 7:XYZ Ltd. has issued 15% preference shares of the face value of Rs.100 each to be redeemed after 10 years. Flotation cost is expected to be 4%. Determine the cost of preferences shares.

(A) (M13 - 5M) (ANS.: 15.71%)

MODEL 3.1.1: DIVIDEND PRICE APPROACH WITH CONSTANT DIVIDEND:

PROBLEM NO 8: A company which is not subject to growth expects to pay dividend of Rs.12 per share for ever. Calculate the value of a share, assuming 10% as the appropriate discount rate for such a company. *(B) (ANS.: Rs.120)*

MODEL 3.1.2: DIVIDEND PRICE APPROACH WITH CONSTANT GROWTH:

PROBLEM NO 9: Investors require 15% rate of return on equity shares of company Y. What would be the market price of the share if the previous dividend (Do) was Rs.10 and investors expect dividends to grow at a constant rate of (a) 10% (b) 3% (c) - 10% (d) 14%.

(B) (ANS: (A) RS. 220, (B) RS. 85.83, (C) RS.36 (D) RS. 1140)

PROBLEM NO 10: A Company's Share was sold for Rs.146 per share. A Long term earnings Growth rate of 7.5% is anticipated. The Company is expected to pay dividend of Rs.3.36 per share.

A. What 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 the company 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?

(A) (ANS.: A) 9.8%; B) 9.68%, G = 6%)

MODEL 3.2.1: EARNINGS / PRICE APPROACH WITH CONSTANT EARNINGS:

PROBLEM NO 11: Prabhat Ltd. has 50000 equity shares of Rs. 10 each and its current market value is Rs. 45 each. The after tax profit of the company for the year ended 31st March, 2002 is Rs. 9,60,000. Calculate the cost of capital based on price / earnings method. *(C) (RK) (ANS: 42.67%)*

MODEL 3.2.2 EARNINGS / PRICE APPROACH WITH GROWTH IN EARNINGS:

PROBLEM NO 12: Expected earnings per share (E_1) is Rs. 10 and the current market price of the share (P_0) is Rs. 50 and the earning per share is expected to grow (g) at rate of 8% p.a., Calculate Cost of Equity.

(C) (TN) (ANS.: 28%)

MODEL 3.3: CAPITAL ASSET PRICING MODEL (CAPM) APPROACH:

PROBLEM NO 13: The risk free rate of return is 8%.The shares of Eastern Pharmaceuticals Ltd. (EPL) have to a beta of 1.5 and the return on market portfolio is 16%.The company has recently paid a dividend of Rs.3.00 per share and the dividend are expected to grow at the rate of 5%.The current market price of equity share of EPL is Rs.15.75 per share. Assume that CAPM is applicable.

You are required to answer the following questions:

A. Is the present market price of share at equilibrium? Would you advise purchasing the share?

B. If the market adjusts in such a way that the share is valued at its equilibrium price then what will be the change in the market value of an investment in 1,000 shares of the company.

(A) (AL AG) (ANS.: PRESENT MARKET RATE: 25%; B) P_O = RS.21)

MODEL 4: COST OF RETAINED EARNINGS

PROBLEM NO 14: Y Ltd. retains Rs.10,00,000 out of its current earnings. The expected rate of return to the shareholders, if they had invested the funds elsewhere is 12%. The brokerage is 2% and the shareholders come in 25% tax bracket. Calculate the cost of retained earnings.

(B) (OLD PM, SIMILAR M19(O)(N)) (ANS.: 69%)

MODEL 5.1: WACC - BOOK VALUE WEIGHTS

PROBLEM NO 15: The following is the capital structure of Simons Company Ltd. as on 31.12.1998:

	Rs.
Equity shares: 10,000 shares (of Rs. 100 each)	10,00,000
10% Preference Shares (of Rs. 100 each)	4,00,000
12% Debentures	6,00,000
	20,00,000

The market price of the company's share is Rs.110 and it is expected that a dividend of Rs.10 per share would be declared for the year 1998. The dividend growth rate is 6%.

A. If the company is in the 50% tax bracket, compute the weighted average cost of capital using Book value weights.

B. Assuming that in order to finance an expansion plan, the company intends to borrow a fund of Rs. 10 lakhs bearing 14% rate of interest, what will be the company's revised weighted average cost of capital? This financing decision is expected to increase dividend from Rs. 10 to Rs. 12 per

share. However, the market price of equity share is expected to decline from Rs. 110 to Rs. 105 per share. *(A) (OLD PM) (ANS.: A. 11.34%, B. 10.67%)*

MODEL 5.2: WACC - MARKET VALUE WEIGHTS

PROBLEM NO 16: The present capital structure of a company is as follows:

(Rs. million)

Equity shares (face value Rs.10)	240
Reserves	360
11% Preference shares (face value Rs.10)	120
12% Debentures	120
14% Term loans	360
	1,200

Additionally, the following information are available:

Company's equity beta	1.06
Yield on long-term treasury bonds	10%
Stock market risk premium	6%
Current ex-dividend equity share price	Rs.15
Current ex-dividend preference share price	Rs.12
Current ex-interest debenture market value	Rs.102.50 per Rs.100
Corporate tax rate	40%

The debentures are redeemable after 3 years and interest is paid annually. Ignoring floatation costs, calculate the company's weighted average cost of capita (WACC). *(A) (ANS.: WACC 11.20%)*

MODEL 6: MARGINAL COST OF CAPITAL

PROBLEM NO 17: The R & G Company has following capital structure at 31st March, 2009, which is considered to be

optimum:	(Rs.)
13% Debenture	3,60,000
11% Preference share capital	1,20,000
Equity share capital (2,00,000 shares)	19,20,000

The company's share has a current market price of Rs. 27.75 per share. The expected dividend per share in next year is 50% of the 2009 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EPS(Rs.)	1.00	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773

The company can issue 14% new debenture. The company's debenture is currently selling at Rs. 98. The new preference issue can be sold at a net price of Rs. 9.80, paying a dividend of Rs. 1.20 per share. The company's marginal tax rate is 50%.

i) Calculate the after tax cost (a) of a new debts and new preference share capital, (b) of ordinary equity, assuming new equity comes from retained earnings.

ii) Calculate the marginal cost of capital.

iii) How much can be spent for capital investment before new ordinary share must be sold? Assuming that retained earnings available for next year's investment are 50% of 2009 earnings.

iv) What will be marginal cost of capital (cost of fund raised in excess of the amount calculated in part (iii) if the company can sell new ordinary shares to net Rs. 20 per share? The cost of debt and of preference capital is constant. *(A) (RK) (ANS.: I) 7%, 12%, 17%; II) 15.3%; III) RS. 3,46,625; IV) 16.82%)*

ADDITIONAL PROBLEMS FOR STUDENTS SELF PRACTICE

PROBLEM NO 1: PQR Ltd. has the following capital structure on October 31, 2018:

Sources of capital	Rs.
Equity share capital (2,00,000 shares of Rs. 10 each)	20,00,000
Reserves & Surplus	20,00,000
12% Preference share capital	10,00,000
9% debentures	30,00,000
	80,00,000

The Market price of equity share is Rs.30. It is expected that the company will pay next year a dividend of Rs. 3 per share, which will grow at 7% forever . Assume 40% income tax rate.You are required to compute weighted average cost of capital using market value weights.

PROBLEM NO 2: Annova Ltd is considering raising of funds of about Rs.250 lakhs by any two alternative method, viz, 14% institutional term loan and 13% non-convertible debentures. The term loan option would attract no major incidental cost and can be ignored. The debentures would have to be issued at a discount of 2.5% and would involve cost of issue of 2% on face value.

Advise the company as to the better option based on the effective cost of capital in each case. Assume tax rate of 50%.

PROBLEM NO 3: The entire capital employed by a company consists of one lakh equity shares of Rs. 100 each. Its current earnings are Rs. 10 lakhs per annum. The company wants to raise additional funds of Rs. 25 lakhs by issuing new shares. You required to calculate the cost of equity capital presuming that the earnings of the company are expected to remain stable over the next few years. *(C) (MI) (ANS: 10%)*

PROBLEM NO 4: X Ltd. issued Rs. 100, 12% debentures 5 years ago. Interest rates have been risen since then, so that debentures of the company are now selling at 15 yield basis.

Case a: Determine the current expected market price of the debentures. Would you buy the debentures for Rs. 75?

Case b: Assuming that the debentures of the company are selling at Rs. 80 and have 5 years to run to maturity, compute the approximate effective yield an investor would earn on his investment.

(A) (TN) (ANS.: A) RS. 80, INVESTOR SHOULD BUY THESE DEBENTURES; B) 17.77%)

PROBLEM NO 5: ABC company sold Rs.1,000 16% debentures, carrying no maturity date to the public 5 years ago Interest rates since have risen, so that debentures of the quality represented by this company are now selling at 14% yield basis.

a) Determine the current indicated market price of debentures. Would you buy the debentures for Rs.1, 200? Explain your answer.

b) Assuming that the debentures of the company are selling at Rs.1,040 and if the debentures have 8 years to run to maturity, compute the approximate effective yield an investor would earn on his investment. *(A) (ANS: A) MARKET PRICE: RS.1,143; B) YIELD:15.19%)*

PROBLEM NO 6: ABC Ltd. has just declared and paid a dividend at the rate 15% on the equity share of Rs.100 each. The expected future growth rate in dividends is 12%. Find out the cost of capital of equity shares given that the present market value of the share is Rs.168. *(C) (ANS.: 22%)*

PROBLEM NO 7: A company is about to pay dividend of Rs.1.40 per share having a market price of Rs.19.50. The expected future growth in dividends is estimated at 12%. Calculate K_e. *(C) (ANS.:19%)*

PROBLEM NO 8: The current market price of shares of A Ltd. is Rs.95. The floatation costs are Rs.5 per share. Dividend per share amounts to Rs.4.50 and is expected to grow at the rate of 7%. You are required to calculate cost of equity share capital. *(C) (ANS.: 12.35%)*

PROBLEM NO 9: The following facts are available:

A. Risk-free rate, 9 per cent

B. Required rate of return, on market portfolio18 per cent

C. Beta coefficient of the shares of ABC Ltd, 1.5

D. Expected dividend during the next year, Rs.3

E. Growth rate in dividends/earnings, 8 per cent

Compute the price at which the shares of ABC Ltd should sell? *(B) (ANS.: Rs.20.68)*

PROBLEM NO 10: Three companies A, B & C are in the same type of business and hence have similar operating risks. However, the capital structure of each of them is different and the following are the details:

	A	B	C
Equity share capital [face value Rs.10/- per share]	Rs.4,00,000	Rs.2,50,000	5,00,000
Market Value per share	15	20	12
Dividend per share	2.70	4	2.88
Debentures [face value per debenture]	Nil	1,00,000	2,50,000
Market value per debenture	-	125	80
Interest rate	-	10%	8%

Assume that the current levels if dividends are generally expected to continue indefinitely and the income tax rate at 50%.

You are required to compute Weighted Average Cost of Capital. *(B) (ANS: 18%; 16.8%; 19.25%)*

PROBLEM NO 11: G Limited has the following capital structure, which it considers to be optimal:

Capital Structure	Weightage (in %)
Debt	25
Preference Shares	15
Equity Shares	60
	100

G Limited's expected net income this year is Rs. 34,285.72, its established dividend payout ratio is 30 per cent, its tax rate is 40 per cent, and investors expect earnings and dividends to grow at a constant rate of 9 per cent in the future. It paid a dividend of Rs. 3.60 per share last year, and its shares currently sells at a price of Rs. 54 per share.

G Limited requires additional funds which it can obtain in the following ways:

- **Preference Shares:** New preference shares with a dividend of Rs. 11 can be sold to the public at a price of Rs.95 per share.
- **Debt:** Debt can be sold at an interest rate of 12 per cent.

You are required to:

i) DETERMINE the cost of each capital structure component; and

ii) COMPUTE the weighted average cost of capital (WACC) of G Limited.

(A) (MTP M18,MTP M19(O)) (ANS: (i) Ke = 16.27%, Kp = 11.58%, Kd = 7.20% (ii) WACC = 13.30%)

PROBLEM NO 12: Determine the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:

Sources	Book Value (Rs.)	Market Value (Rs.)
Equity shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	-

Preference shares	9,00,000	10,40,000
Debentures	36,00,000	33,75,000

Additional information:

A. **Equity:** Equity shares are quoted at Rs. 130 per share and a new issue priced at Rs. 125 per share will be fully subscribed; flotation costs will be Rs. 5 per share.

B. **Dividend:** During the previous 5 years, dividends have steadily increased from Rs. 10.60 to Rs. 14.19 per share. Dividend at the end of the current year is expected to be Rs. 15 per share.

C. **Preference shares:** 15% Preference shares with face value of Rs. 100 would realize Rs. 105 per share.

D. **Debentures:** The Company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2%.

Tax: Corporate tax rate is 35%. Ignore dividend tax. *(A) (OLD SM) (ANS.: 16.84%, 17.28%)*

(SOLVE PROBLEM NO 27, 28, 29 OF ASSIGNMENT PROBLEMS AS REWORK)

PROBLEM NO 13: The following figures are taken from the current B/S of Delaware & Co.

Particulars	Amount(Rs.)
Capital	8,00,000
Share Premium	2,00,000
Reserves	6,00,000
Shareholder's funds	16,00,000
12% Irredeemable debentures	4,00,000

An annual ordinary dividend of Rs.2 per share has just been paid. In the past, ordinary dividends have grown at a rate of 10% per annum and this rate of growth is expected to continue. Annual interest has recently been paid on the debentures. The ordinary shares are currently quoted at Rs.27.5 and the debentures at 80%. Ignore taxation. You are required to estimate the weighted average cost of capital (based on market values) for Weighted Average Cost of Capital Delaware & Co.

(B) (SIMILAR: MTP N18(N)RTP N19(O)(N)) (ANS.: 17.62%)

THE END