

Chapter 2

Cost of Capital

Question 1 - Study Material

Five years ago, Sona Limited issued 12 per cent irredeemable debentures at ₹ 103, at ₹ 3 premium to their par value of ₹ 100. The current market price of these debentures is ₹ 94. If the company pays corporate tax at a rate of 35 per cent CALCULATE its current cost of debenture capital?

Question 2 - Study Material

A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2017 to be matured on 1.4.2022. The debentures will be redeemed on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

Question 3 - Study Material

A company issued 10,000, 10% debentures of ₹ 100 each at par on 1.4.2012 to be matured on 1.4.2022. The company wants to know the cost of its existing debt on 1.4.2017 when the market price of the debentures is ₹ 80. COMPUTE the cost of existing debentures assuming 35% tax rate.

Question 4 -

A Company sells a 4 year Bond of ₹ 20,000 at 12.5% Interest per annum. The bond will be amortised equally over its life. What will be the Present value of the Bond for an investor who expects a minimum rate of return of 12%?

Question 5 - Study Material

Reserve Bank of India is proposing to sell a 5-year bond of ₹ 5,000 at 8 per cent rate of interest per annum. The bond amount will be amortised over its life. What is the bond's present value of an inventor if he expects a minimum rate of return of 6 per cent?

Question 6 - Study Material , Pyq

(a) A company issues ₹ 10,00,000 16% debentures of ₹ 100 each. The company is in the 35% tax bracket. You are required to calculate the cost of debt after tax. If debentures are issued at (i) par, (ii) 10% discount and (iii) 10% premium.

(b) If brokerage is paid at 2% what will be the cost of debentures if the issue is at par?

Question 7 - Pyq

A Company issues ₹ 10,00,000 12% debentures of ₹ 100 each. The debentures are redeemable after the expiry of a fixed period of 7 years. The Company is in the 35% tax bracket. Required:

(i) Calculate the cost of debt after tax, if debentures are issued at

- a) Par;
- b) 10% Discount;
- c) 10% Premium.

(ii) If brokerage is paid at 2%, what will be the cost of debentures, if the issue is at par?

Alternative Mode of Debt

Question 8 - Study Material

A. Institutional Development Bank(IDB) issued Zero interest deep discount bonds of face value of ₹1,00,000 each issued at ₹2500 & repayable after 25 years. COMPUTE the cost of debt if there is no corporate tax.

B. Development Finance Corporation issued zero interest deep discount bonds of face value of ₹1,50,000 each issued at ₹ 3,750 & repayable after 25 years. COMPUTE the cost of debt if there is no corporate tax. :MTP APRIL 2021

Question 8B - Pyq

TT Ltd. issued 20,000, 10% convertible debenture of ₹ 100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert debentures into equity shares of the company in a ratio of 1:5 (5 shares for each debenture). The current market price of the equity share is ₹ 20 each and historically

the growth rate of the share is 4% per annum. Assuming tax rate is 25%. Compute the cost of 10% convertible debenture using Approximation Method and Internal Rate of Return Method.

PV Factor are as under:

Year	1	2	3	4	5
PV Factor @ 10%	0.909	0.826	0.751	0.683	0.621
PV Factor @ 15%	0.870	0.756	0.658	0.572	0.497

Question 9 -

A Company is considering raising funds of about ₹ 100 lakhs by one of two alternative methods, viz. 14% Institutional Term Loan and 13% Non-Convertible Debentures. The Term Loan option would attract no major incidental cost. The Debentures would be issued at a discount of 2.5% and would involve a cost of issue ₹ 1 lakh. Advice the company as to the better option based on effective cost of capital. Assume Tax Rate of 50%. [Debentures Kd = 6.74% Rank I, Term Loan Kd = 7.00% Rank II]

Practical Problems on Cost of Preference Share Capital

Question 10 - Study Material

If Reliance Energy is issuing preferred stock at ₹ 100 per share, with a stated dividend of ₹ 12, and a floatation cost of 3% then, what is the cost of preference share?

Question 11 - Study Material

XYZ & Co. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. Calculate the Cost of Preference Shares.

Question 12 - Study Material

Referring to the earlier question but taking into consideration that if 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? [KP = 0.107]

Question 13 - Pyq

A company issued 40,000, 12% Redeemable Preference Shares of ₹100 each at a premium of ₹ 5 each, redeemable after 10 years at a premium of ₹ 10 each. The floatation cost of each share is ₹ 2. You are required to calculate the cost of preference share capital ignoring dividend tax.

Question 14 -

Correct Ltd. issued 30,000 15% Preference shares of ₹ 100 each, redeemable at 10% premium after 20 years. Issue Management Expenses were ₹ 30,000. Find out the Cost of Preference Capital, if shares are issued – (a) at par, (b) at a premium of 10%, and (c) at a discount of 10%.

Practical Problems on Cost of Equity Share Capital

Dividend Price Approach

Question 15 -

Bee Ltd. has a stable income and stable dividend policy. The average annual dividend payout is ₹ 27 per share (Face value = ₹ 100). You are required to find out:

1. Cost of Equity Capital, if market price in Year 1 is ₹ 150.
2. Expected Market price in Year 2, if cost of Equity is expected to rise to 20%.
3. Dividend payout required in year 2, if the company were to have an expected Market Price of ₹ 160 per share, at the existing Cost of Equity.

Earnings Price Approach

Question 16 -

Renowned Ltd. has a uniform income that accrues in a four year business cycle. It has an average EPS of ₹ 25 (per share of ₹ 100) over its business cycle. You are required to find out:

1. Cost of Capital, if Market Price in Year 1 is ₹ 150.
2. Expected Market Price in Year 2, if Cost of Equity is expected to rise to 18%
3. EPS in Year 2, if the Company were to have an expected Market Price of ₹ 160 per share, at the existing Cost of Equity.

Dividend Growth Model Approach**Question 17 - Study Material**

A company has paid a dividend of Re. 1 per share (of face value of ₹ 10 each) last year and it is expected to grow @ 10% next year. Calculate the Cost of Equity if the Market Price of Share is ₹ 55.

Question 18 -

A company's current price of share is ₹ 60 and dividend per share is ₹ 4. If its capitalisation rate is 12%, what is the Dividend growth rate?

Question 19 - Study Material

A company's share is quoted in the market at ₹ 40 currently. A company pays a dividend of ₹ 2 per share and investors expect a growth rate of 10% per year, compute:

- The company's cost of equity capital.
- If anticipated growth rate is 11% p.a. calculate the indicated market price per share.
- If the company's cost of capital is 16% and anticipated growth rate is 10% p.a., calculate the market price if a dividend of ₹ 2 per share is to be maintained.

Question 20 -

During the past four years following dividend has been paid by Bharat Ltd. which are as follows:

Year Ended	Dividend per Share (₹)
2002	26
2005	30

The company has issued 10,000 ordinary shares of ₹ 100 each. The current market value of each ordinary share of Bharat Ltd. is ₹ 235 cum-dividend. The 2005 dividend of ₹ 30 per share has just been paid. You are required to estimate the cost of capital for Bharat Ltd. ordinary share capital.

Question 21 -

A company's policy is to pay dividends at the rate of 5% on the market price of the share at the beginning of year. Find the growth rate if $K_e = 12\%$.

Valuation of Equity Share Capital – Present Value of Future Dividend Flows**Question 22 - Study Material**

Calculate the cost of equity from the following data using realized yield approach:

Year	1	2	3	4	5
Dividend per share	1.00	1.00	1.20	1.25	1.15
Price per share(at the beginning)	9.00	9.75	11.50	11.00	10.60

Question 23 - Study Material

Mr. Mehra had purchased a share of Alpha Limited for ₹1,000. He received a dividend for a period of five years at the rate of 10 percent. At the end of the fifth year, he sold the share of Alpha Limited for ₹1,128. You are required to Compute the cost of equity as per realised yield approach.

Capital Asset Pricing Model (CAPM)**Question 24 - Study Material**

Calculate the Cost of Equity of H Ltd., whose risk free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

Question 25 -

Compute Cost of Equity if Interest on Government Bonds is 6%, Market Return is 18%, Beta Factor for Company K is 1.10.

Question 26 -

The Risk-free return is 9% and the Market return is 15%. Ram intends to invest 80% of his money in an investment having a beta of 0.8 and 20% of this investment having a Beta of 1.4. Required:

- What will be the return from each investment?
- What will be his overall return?
- What will be the Beta Factor for his total investment?

Question 27 -

A Company has estimated that overall return for the Market will be 15%, Interest rate on Treasury securities will average 10%. Management has attached the following Probabilities to possible outcome:

Probability	0.2	0.3	0.2	0.2	0.1
Beta	1.00	1.10	1.20	1.30	1.40

- (a) What is the required rate of return for the project using the mode – average beta of 1.10?
 (b) What is the range of required rates of return?
 (c) What is the expected value of the required rate of return?

Cost of Equity using CAPM and Product Wise Beta**Question 28 - Pyq**

You are analysing the beta for XYZ Computers Ltd. and have divided the Company into four broad business groups, with market values and betas for each group.

Business Group	Market Value of Equity	Beta
Main Frames	₹ 100 Billion	1.10
Personal Computers	₹ 100 Billion	1.50
Software	₹ 50 Billion	2.00
Printers	₹ 150 Billion	1.00

XYZ Computers Ltd. has ₹ 50 billion in debt outstanding. Required:

- (i) Estimate the beta for XYZ Computers Ltd. as a Company.
 (ii) If the Treasury bond rate is 7.5%, estimate the Cost of Equity for XYZ Computers Ltd. Estimate the Cost of Equity for each division. Which Cost of Equity would you use to value the printer division? The average market risk premium is 8.5%.

Realised Yield Approach**Question 29 -**

An individual wishes to purchase the share of a Company for ₹ 500. At present, the Company is expected to pay a dividend of ₹ 40 on this share at the end of the year and its Market Price after the payment of the dividend is expected to be ₹ 520. What is the Cost of Equity in this case, using the Realised Yield Approach?

Question 30 - Rtp

Jet Ltd is a Large Company with several thousand shareholders. An investor buys 100 shares of the company at the beginning of the year at a Market price of ₹ 225. The Par value of each share is ₹ 10. During the year, the company pays a dividend at 25%. The Price of the share at the end of the Year is ₹ 267.50. Calculate the total return on the Investment. Suppose the investor sells the shares at the end of the year, what would be the cash Inflows at the end of the year?

Question 31 -

A company issues:

- 15% convertible debentures of ₹ 100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk - free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid a dividend of ₹ 12.76 per share. Five years ago, it paid a dividend of ₹ 10 per share. Flotation cost is 5% of issue amount.
- 5% preference shares of ₹ 100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount. Assuming corporate tax rate is 40%.
 - Calculate the cost of convertible debentures using the approximation method.
 - Use the YTM method to Calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
PVIF 0.03, t	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
PVIF 0.05, t	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
PVIFA 0.03, t	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
PVIFA 0.05, t	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
FVIF i, 5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
FVIF i, 6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
FVIF i, 7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

Cost of Retained Earnings**Question 32 -**

Calculate the cost of retained earnings from the following information:

Current market price of a share ₹ 140

Cost of Flotation/brokerage per share 3% on market price

Growth in expected dividend 5%

Expected dividend per share on new shares ₹ 14

Shareholders marginal/personal income tax 22%

Question 33 - Pyq

Y Ltd. retains ₹ 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 a 30% tax bracket. Calculate the cost of retained earnings.

Weighted Average Cost of Capital**Question 34 - Pyq**

The following is the extract of the Balance Sheet of M/s KD Ltd.:

Particulars	Amount (₹)
Ordinary shares (Face Value ₹ 10/- per share)	5,00,000
Share Premium	1,00,000
Retained Profits	6,00,000
8% Preference Shares (Face Value ₹ 25/- per share)	4,00,000
12% Debentures (Face value ₹ 100/- each)	6,00,000
	22,00,000

The ordinary shares are currently priced at ₹ 39 ex-dividend and preference share is priced at ₹ 18 cum-dividend. The debentures are selling at 120 percent ex-interest. The applicable tax rate to KD Ltd. is 30 percent. KD Ltd.'s cost of equity has been estimated at 19 percent. Calculate the WACC (weighted average cost of capital) of KD Ltd. on the basis of market value.

Question 35 - Rtp

The information relating to book value (BV) and market value (MV) weights of Ex Limited is given below:

Sources	Book Value (₹)	Market Value (₹)
Equity shares	2,40,00,000	4,00,00,000
Retained earnings	60,00,000	-
Preference shares	72,00,000	67,50,000
Debentures	18,00,000	20,80,000

Additional information:

- Equity shares are quoted at ₹ 130 per share and a new issue priced at ₹ 125 per share will be fully subscribed; flotation costs will be ₹ 5 per share on face value.
- During the previous 5 years, dividends have steadily increased from ₹ 10 to ₹ 16.105 per share. Dividend at the end of the current year is expected to be ₹ 17.716 per share.
- 15% Preference shares with face value of ₹ 100 would realise ₹ 105 per share.
- 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% on face value.
- Corporate tax rate is 30%.

You are required to Determine the weighted average cost of capital of Ex Limited using both the weights.

Question 36 - Pyq

SK Limited has obtained funds from the following sources, the specific cost are also given against them:

Sources of Funds	Amount	Cost of capital
Equity Shares	₹ 30,00,000	15%
Preference Shares	₹ 8,00,000	8%

You are required to calculate the Weighted Average Cost of Capital. Assume that the corporate Tax rate is 30%.

Question 37 - Pyq

PQR Ltd. has the following Capital Structure on 31st October:

Equity Share Capital (2,00,000 Shares of ₹ 10 each)	₹ 20,00,000
Reserves and Surplus	₹ 20,00,000
12% Preference Shares	₹ 10,00,000
9% Debentures	₹ 30,00,000
Total	₹ 80,00,000

The Market Price of Equity Share is ₹ 30. It is expected that the Company will pay next year a dividend of ₹ 3 per share, which will grow at 7% forever. Assume 40% Income tax rate. You are required to compute the Weighted Average Cost of Capital of the Company using Market Value Weights.

Question 38 - Pyq

The Capital Structure of a Company as on 31st March is as follows

Equity Share Capital (6,00,000 Shares of ₹ 100 each)	₹ 6.00 Crores
Reserves and Surplus	₹ 1.20 Crores
12% Debentures of ₹ 100 each	₹ 1.80 Crores

For the year ended 31st March, the company has paid Equity Dividend at 24%. Dividend is likely to grow by 5% every year. Market Price of Equity Share is ₹ 600 per Share. Income Tax Rate applicable to the Company is 30%. Required:

1. Compute the Current Weighted Average Cost of Capital.
2. The Company has a plan to raise a further ₹ 3 crores by way of Long Term Loan at 18% Interest. If the Loan is raised, the Market Price of Equity Share is expected to fall to ₹ 500 per share. What will be the new Weighted Average Cost of Capital of the Company?

Question 39 - Pyq

The Capital structure of PQR Ltd. is as follows:

	₹
10% Debenture	3,00,000
12% Preference Shares	2,50,000
Equity Share (face value ₹ 10 per share)	5,00,000
	10,50,000

Additional Information:

- (i) ₹ 100 per debenture redeemable at par has 2% floatation cost & 10 years of maturity. The market price per debenture is ₹ 110.
- (ii) ₹ 100 per preference share redeemable at par has 3% floatation cost & 10 years of maturity. The market price per preference share is ₹ 108.
- (iii) Equity share has ₹ 4 floatation cost and market price per share of ₹ 25. The next year expected dividend is ₹ 2 per share with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.
- (iv) Corporate Income Tax rate is 30%. Required:
Calculate Weighted Average Cost of Capital (WACC) using market value weights.

Question 40 - Study Material

Gamma Limited has in issue 5,00,000 ₹ 1 ordinary shares whose current ex-dividend market price is ₹ 1.50 per share. The company has just paid a dividend of 27 paise per share, and dividends are expected to continue at this level for some time. If the Company has no debt, what is the Weighted Average Cost of Capital?

WACC – Using Market Value Weights

Question 41 - Study Material

The following details are provided by the GPS Limited:

	(₹)
Equity Share Capital	65,00,000
12% Preference Share Capital	12,00,000
15% Redeemable Debentures	20,00,000
10% Convertible Debentures	8,00,000

The cost of equity capital for the company is 16.30% and income tax rate for the company is 30%. You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of the company.

Question 42 - Study Material

(i) 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	Market Value
	(₹)	(₹)
Equity Shares	1,20,00,000	2,00,00,000
Retained Earnings	30,00,000	---
Preference Shares	36,00,000	33,75,000
Debentures	9,00,000	10,40,000

(ii) Additional information:

- I. Equity: Equity shares are quoted at ₹ 130 per share and a new issue priced at ₹ 125 per share will be fully subscribed; flotation costs will be ₹ 5 per share.
- II. Dividend: During the previous 5 years, dividends have steadily increased from ₹ 10.60 to ₹ 14.19 per share. Dividend at the end of the current year is expected to be ₹ 15 per share.
- III. Preference shares: 15% Preference shares with face value of ₹ 100 would realise ₹ 105 per share.
- IV. 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%.
- V. Tax : Corporate tax rate is 35%. Ignore dividend tax. Floatation cost would be calculated on face value.

Calculate Weighted Average Cost of Capital (WACC) using Market Value Weights.**Question 43 - Pyq**

The following is the Capital Structure of the Company:

Source of Capital	Book Value	Market Value
Equity Shares at ₹ 100 each	₹ 80,00,000	₹ 1,60,00,000
9% Cumulative Preference Shares at ₹ 100 each	₹ 20,00,000	₹ 24,00,000
11% Debentures	₹ 60,00,000	₹ 66,00,000
Retained Earnings	₹ 40,00,000	Nil

The Current Market Price of the Company's Equity Share is ₹ 200. For the last year, the Company had paid an Equity Dividend at 25% and its Dividend is likely to grow 5% every year. The corporate tax rate is 30% and shareholder's personal income tax rate is 20%. Calculate:

- (1) Cost of Capital for each Source of Capital.
- (2) Weighted Average Cost of Capital on the basis of Book Value Weights.
- (3) Weighted Average Cost of Capital on the basis of Market Value Weights.

Question 44 - Pyq

ABC Ltd. wishes to raise additional finance of ₹ 20 lakhs for meeting its Investment Plans. The company has ₹ 4,00,000 in the form of retained earnings available for investment purposes. The following are the further details:

- Debt equity ratio 25: 75.
- Cost of debt at the rate of 10 percent (before tax) upto ₹ 2,00,000 and 13% (before tax) beyond that.
- Earnings per share, ₹ 12.
- Dividend payout 50% of earnings.
- Expected growth rate in dividend 10%.
- Current market price per share, ₹ 60.
- Company's tax rate is 30% and shareholder's personal tax rate is 20%.

Required:

- (i) Calculate the post-tax average cost of additional debt.
- (ii) Calculate the cost of retained earnings and cost of equity.
- (iii) Calculate the overall weighted average (after tax) cost of additional finance.

Question 45 - Rtp

Jason Limited is planning to raise additional finance of ₹ 20 lakhs for meeting its new project plans. It has ₹ 4,20,000 in the form of retained earnings available for investment purposes. Further details are as following:

Debt / Equity Mix	30 / 70
Cost of Debt	
Upto ₹ 3,60,000	8 % (before tax)
Beyond ₹ 3,60,000	12 % (before tax)

Earnings per share	₹ 4
Dividend pay-out	50% of earnings
Current Market Price per share	₹ 44
Expected Growth rate in Dividend	10 %
Tax	40%

You are required:

- To determine the cost of retained earnings and cost of equity.
- To determine the post-tax average cost of additional debt.
- To determine the pattern for raising the additional finance, and
- Compute the overall weighted average after tax cost of additional finance.

WACC – Book Value and Market Value Weights

Question 46 - Pyq

You are required to determine the Weighted Average Cost of Capital of a firm using – (i) Book Value Weights, and (ii) Market Value Weights. The following information is available for your perusal:

- Present book value of the firm's capital structure is – Debentures of ₹ 100 each ₹ 8,00,000, Preference Shares of ₹ 100 each ₹ 2,00,000, Equity Shares of ₹ 10 each ₹ 10,00,000.
- All these securities are traded in the capital markets. Recent Prices are: Debentures at ₹ 110, Preference Shares at ₹ 120 and Equity Shares at ₹ 22.
- Anticipated external financing opportunities are as follows:
 - ₹ 100 per Debenture redeemable at par: 20 years maturity 8% Coupon Rate, 4% Floatation Costs, Sale Prices ₹ 100.
 - ₹ 100 Preference Shares redeemable at par: 15 years maturity, 10% Dividend Rate, 5% Floatation Costs, Sale prices ₹ 100.
 - Equity Shares: ₹ 2 per Share Floatation Costs, Sale Price ₹ 22.

In addition, the dividend expected on the Equity Share at the end of the year is ₹ 2 per share, the anticipated Growth Rate in Dividend is 5% and the Firm has the practice of paying all its earnings in the form of dividend. The Corporate Tax Rate is 50%.

WACC – Present and New Capital Structure

Question 47 - Rtp, Pyq

JKL Ltd. has the following book-value capital structure:

Particulars	Amount (₹)
Equity Share Capital (2,00,000 shares)	40,00,000
11.5% Preference Shares	10,00,000
10% Debentures	30,00,000
	80,00,000

The equity share of the company sells for ₹ 20. It is expected that the company will pay next year a dividend of ₹ 2 per equity share, which is expected to grow at 5% p.a. forever. Assume a 35% corporate tax rate.

- Compute weighted average cost of capital (WACC) of the company based on the existing capital structure.
- Compute the new WACC, if the company raises an additional ₹ 20 lakhs debt by issuing 12% debentures.

This would result in increasing the expected equity dividend to ₹ 2.40 and leave the growth rate unchanged, but the price of equity share will fall to ₹ 16 per share.

Comment on the use of weights in the computation of weighted average cost of capital.

Debt – Equity Ratio using WACC

Question 48 -

Aries Ltd has a WACC of 18.00%. Its Capital Structure consists of Equity and Debt only. If the PE Ratio is 4, Interest Rate on Debt Is 15%, Tax Rate is 35%, find out the Company's Debt-Equity Ratio.

Question 49 -

Step Ltd. has a WACC of 20.00%. Preference Capital (Dividend Rate 18%) constitutes 30% of the Total Capital Employed. If the PE Ratio is 4, Interest Rate on Debt is 15%, Tax Rate is 35%, find out the ratio between Debt and Equity Capital in the Company.

Effect of Debt Funding on Value of Equity Shares – WACC not affected by Gearing**Question 50 - Rtp**

Zeta Ltd is presently financed entirely by Equity Shares. The current Market Value is ₹ 6,00,000. A Dividend of ₹ 1,20,000 has just been paid. This level of dividend is expected to be paid indefinitely. The Company is thinking of investing in a new project involving an outlay of ₹ 5,00,000 now and is expected to generate Net Cash Receipts of ₹ 1,05,000 per annum indefinitely. The project would be financed by issuing ₹ 5,00,000 Debentures at 18% Interest Rate. Ignoring tax consideration:

1. Calculate the Value of Equity Shares & the gain made by Shareholders, if the Cost of Equity rises to 21.6%.
2. Prove that the Weighted Average Cost of Capital is not affected by gearing.

Marginal WACC**Question 51 - Rtp Pyq**

Amrit Corporation has the following book value capital structure:

Equity Capital (50 lakh shares of ₹ 10 each).	₹ 5,00,00,000
15% Preference share (50,000 shares ₹ 100 each)	₹ 50,00,000
Retained earnings	₹ 4,00,00,000
Debentures 14% (2,50,000 debentures ₹ 100 each)	₹ 2,50,00,000
Term loan 13%	₹ 4,00,00,000

The company's last year earnings per share was ₹ 5, and it maintains a dividend pay-out ratio of 60% and returns on equity is 10%. The market price per share is ₹ 20.8. Preference share redeemable after 10 years is currently selling for ₹ 90 per share. Debentures redeemable after 6 years are currently selling for ₹ 75 per debenture. The income tax rate is 40%.

1. Calculate the Weighted Average Cost of Capital (WACC) using market value proportions.
2. Determine the Marginal Cost of Capital (MACC) if it needs ₹ 5,00,00,000 next year assuming the amount will be raised by 60% equity, 20% debt and 20% retained earnings. Equity issues will fetch a net price of ₹ 14 and cost of debt will be 13% before tax up to ₹ 40,00,000 and beyond ₹ 40,00,000 it will be 15% before tax.

Question 52 -

On January 1, 2005 the total market value of the Octane Company was ₹ 60 million. During the year, the company plans to raise and invest ₹ 30 million in new projects. The firm's present market value capital structure, shown below, is considered to be optimal.

Assume that there is no short term debt.

Debt	₹ 3,00,00,000
Common Equity	₹ 3,00,00,000
Total Capital	₹ 6,00,00,000

New bonds will have an 8% coupon rate, and they will be sold at par. Common stock, currently selling at ₹ 30 a share, can be sold to net the company ₹ 27 a share. Stockholders' required rate of return is estimated to be 12% consisting of a dividend yield of 4% and an expected constant growth rate of 8%. (The next expected dividend is ₹ 1.20, so, ₹ 1.20/30 = 4%) Retained Earnings for the year are estimated to be ₹ 3 million. The marginal corporate tax is 40%.

- a) To maintain the present capital structure, how much of the new investment must be financed by common equity?
- b) How much of the needed new common equity funds must be generated internally?
- c) Calculate the cost of each common equity component?
- d) At what level of capital expenditures will the firm's WACC increase?
- e) Calculate the firm's WACC using (1) the cost of retained earnings (First breaking point) and (2) the cost of new equity (second breaking point) (3) WACC of additional funds ₹ 30 million.

Question 53 - Pyq

The R & G Co. has following capital structure at 31st March 2010, which is considered to be optimum

Particulars	Amount (₹)
13% Debentures	3,60,000
11% Preference	1,20,000
Equity Share Capital (2,00,000 Shares)	19,20,000

The Company's Share has a current market price of ₹ 27.75 per share. The expected Dividend per share in the next year is 50% of the 2010 EPS of last 10 years is as follows. The past trends are expected to continue:

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EPS (₹)	1	1.12	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 ₹ 9.80, paying a dividend of ₹ 1.20 per share. The Company's Marginal Tax Rate is 50%.

Required:

1. Calculate the After Tax Cost – (a) of new Debt and new preference Share Capital, (b) of ordinary Equity, assuming new Equity comes from Retained Earnings.
2. Calculate the marginal cost of capital.
3. How much can be spent for Capital Investment before new ordinary shares must be sold? Assuming that retained earnings available for next year's investment are 50% of 2010 earnings.
4. What will be Marginal Cost of Capital (Cost of fund raised in excess of the amount calculated in Part (3) , if the company can sell new Ordinary shares to net ₹ 20 per share? Cost of Debt and of Preference Capital is constant.

Question 54 - Study Material

ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2010.

Particulars	Amount (₹)
14% debentures	30,000
11% preference shares	10,000
Equity (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of ₹ 23.60. Next year's dividend per share is 50% of 2010 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (₹)	Year	EPS (₹)
2001	1.00	2006	1.61
2002	1.10	2007	1.77
2003	1.21	2008	1.95
2004	1.33	2009	2.15
2005	1.46	2010	2.36

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

Preference share ₹ 9.20 (with annual dividend of ₹ 1.1 per share) was also issued. The company is in the 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 2010.

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

Question 55 - Pyq

MR Ltd. has the following capital structure, which is considered to be optimum as on 31.03.2022.

Equity share capital (50,000 shares)	₹ 8,00,000
12% Pref. share capital	₹ 50,000
15% Debentures	₹ 1,50,000
	₹ 10,00,000

The earnings per share (EPS) of the company were ₹ 2.50 in 2021 and the expected growth in equity dividend is 10% per year. The next year's dividend per share (DPS) is 50% of EPS of the year 2021. The current market price per share (MPS) is ₹ 25.00. The 15% new debentures can be issued by the company. The company's debentures are currently selling at ₹ 96 per debenture. The new 12% Pref. shares can be sold at a net price of ₹ 91.50 (face value ₹ 100 each). The applicable tax rate is 30%.

You are required to Calculate

(a) After tax cost of

1. New debt,
2. New pref. share capital and
3. Equity shares assuming that new equity shares come from retained earnings.

(b) Marginal cost of capital,

How much can be spent for capital investment before sale of new equity shares assuming that retained earnings for next year investment is 50% of 2021?

Equilibrium Price

Question 56 -

A firm has the next expected dividend of ₹ 3 with a growth rate at 8%. The risk free rate, R_f is 10% and market rate of return, R_m is 14%. Presently, the firm has a β , beta factor of 1.50. However, due to a decision of the finance manager, β is likely to increase to 1.75. Find out the present as well as the likely value of the share after the decision.

[Present value = ₹ 37.5; Likely value = ₹ 33.33]

Present Situation	Likely value
1. $K_e = R_f + \beta(ER_m - R_f)$ = $K_e = 10\% + 1.5(14\% - 10\%)$ = $10\% + 6\% = 16\%$	1. $K_e = R_f + \beta(ER_m - R_f)$ = $K_e = 10\% + 1.75(14\% - 10\%)$ = $10\% + 7\% = 17\%$
2. $K_e = (D_1 / P_0) + g$ $16\% = (3/P_0 \times 100) + 8\%$ $8\% = 300/P_0 = P_0 = 37.5$	2. $K_e = (D_1 / P_0) + g$ $17\% = (3/P_0 \times 100) + 8\%$ $9\% = 300/P_0 = P_0 = 33.33$

Question 57 - Rtp

M/s Robert Cement Corporation has a financial structure of 30% debt and 70% equity. The company is considering various investment proposals costing less than ₹ 30 lakhs. The corporation does not want to disturb its present capital structure. The cost of raising the debt and equity are as follows:

Project Cost	Cost of Debt	Cost of Equity
Upto ₹ 5 lakhs	9%	13%
Above ₹ 5 lakhs & upto ₹ 20 lakhs	10%	14%
Above ₹ 20 lakhs & upto ₹ 40 lakhs	11%	15%
Above ₹ 40 lakhs & upto ₹ 1 crore	12%	15.5%

Assuming the tax rate of 50%, you are required to calculate:

1. Cost of capital of two projects A & B whose funds requirements are ₹ 8 Lakhs and ₹ 21 lakhs respectively; and
2. If a project is expected to give an after tax return of 11% determine under what conditions it would be acceptable.

Optimal Debt Equity Mix by Computing Composite Cost of Capital

Question 58 -

For varying levels of Debt-Equity mix, the estimates of the cost of debt (after tax) and equity capital are given below:

Debt as % of Total Capital Employed	Cost of Debt	Cost of Equity
0	Nil	15.0
10	7.0	15.0
20	7.0	15.5
30	7.5	16.0
40	8.0	17.0
50	8.5	19.0
60	9.5	20.0

You are required to decide on the optimal debt equity mix for the company by calculating the composite cost of capital. [Optimum Debt Equity Mix = 40 : 60]

K_e Using WACC – Reverse Working**Question 59 -**

Display Ltd has a Debt Equity Ratio of 2 : 1 and a WACC of 12%. Its Debentures bear interest of 15%. Find out the cost of Equity Capital. (Assume Tax = 35%)

Question 60 - Rtp

Bounce Ltd. evaluates all its capital projects using a discounting rate of 15%. Its capital structure consists of equity share capital, retained earnings, bank term loan and debentures redeemable at par. Rate of interest on bank term loan is 1.5 times that of debenture. Remaining tenure of debenture and bank loan is 3 years and 5 years respectively. Book value of equity share capital, retained earnings and bank loan is ₹ 10,00,000, ₹ 15,00,000 and ₹ 10,00,000 respectively. Debentures which are having book value of ₹ 15,00,000 are currently trading at ₹ 97 per debenture. The ongoing P/E multiple for the shares of the company stands at 5. You are required to Calculate the rate of interest on bank loans and debentures if tax applicable is 25%.

Question 61 - Study Material

CALCULATE the WACC using the following data by using:

- (a) Book value weights
(b) Market value weights

The capital structure of the company is as under:

	(₹)
Debentures (₹ 100 per debenture)	5,00,000
Preference shares (₹ 100 per share)	5,00,000
Equity shares (₹ 10 per share)	10,00,000
	20,00,000

The market prices of these securities are:

Debentures ₹ 105 per debenture
Preference shares ₹ 110 per preference share
Equity shares ₹ 24 each.

Additional information:

- (1) ₹ 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10-year maturity.
(2) ₹ 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10-year maturity.
(3) Equity shares has ₹ 4 floatation cost and market price ₹ 24 per share.

The next year expected dividend is ₹ 1 with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividend.

Corporate tax rate is 30%. Use the YTM method to calculate cost of debentures and preference shares.

Question 62 - Study Material

ABC Company's equity share is quoted in the market at ₹ 25 per share currently. The company pays a dividend of ₹ 2 per share and the investor's market expects a growth rate of 6% per year.

You are required to:

- (i) CALCULATE the company's cost of equity capital.
(ii) If the company issues 10% debentures of face value of ₹ 100 each and realises ₹ 96 per debenture while the debentures are redeemable after 12 years at a premium of 12%, CALCULATE cost of debenture Using YTM? Assume Tax Rate to be 50%.

Question 63 - Rtp

Indel Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2021:

Particulars	(Rs)
14% Debentures	60,000
11% Preference shares	20,000
Equity Shares (10,000 shares)	3,20,000
	4,00,000

The company share has a market price of Rs 47.20. Next year's dividend per share is 50% of 2020 EPS. The following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (Rs)	Year	EPS (Rs)
2011	2.00	2016	3.22
2012	2.20	2017	3.54
2013	2.42	2018	3.90
2014	2.66	2019	4.29
2015	2.93	2020	4.72

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

Preference shares of Rs 18.50 (with annual dividend of Rs 2.22 per share) were also issued. The company is in the 30% tax bracket.

(A) CALCULATE after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

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

(B) CALCULATE marginal cost of capital when no new shares are issued.

(C) DETERMINE the amount that can be spent for capital investment before new ordinary shares must be sold, assuming that the retained earnings for next year's investment is 50 percent of earnings of 2020.

(D) COMPUTE marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at Rs 40 per share?