Concept of Cost of Capital

In simple words, Cost of capital is the cost of acquiring the funds.

On raising funds from various sources, a company has to pay some additional amount in the form of interest, apart from paying the principal amount.

The additional cost is the cost of capital.

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings.

If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of the shareholders.

According to the definition of Solomon Ezra, "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditure".

Definition: The cost of the capital is the minimum rate of return that the company must earn on its investments to fulfil the expectations of the investors.

Cost of capital is **also referred to** as (i) **Break Even Rate**, (ii) **minimum rate**, (iii) **cut-off rate**, (iv) **Target rate**, (v) **Hurdle rate**, (vi) **Standard rate**.

- **Key Function**: The cost of capital serves as a benchmark for evaluating investment opportunities. Projects or investments yielding returns exceeding the cost of capital are considered financially viable.

- **Weighted Average**: In practice, companies calculate a weighted average cost of capital (WACC) that considers the cost of various sources of capital, such as debt and equity, in proportion to their usage in the capital structure.

Components of Cost of Capital

The cost of capital comprises several components, each representing a distinct source of financing. The primary components include:

- **Cost of Debt**: This represents the cost incurred by a company when it borrows money through loans or bonds. It includes interest payments to lenders.
- **Cost of Equity**: The cost of equity capital reflects the returns expected by shareholders. It involves the opportunity cost of investing in the company's stock instead of other investments.
- **Cost of Preferred Stock (Preference shares)**: If a company has preferred stock, it incurs a cost associated with paying dividends to preferred stockholders.
- **Cost of Retained Earnings**: Retained earnings represent profits reinvested in the company instead of being distributed to shareholders as dividends. The cost of retained earnings is typically considered the cost of equity.
- **Cost of Other Financing Sources**: In addition to debt and equity, companies may use various financial instruments and sources of capital, each with its own cost.

Classification of Cost of Capital

The cost of capital can be classified into several categories based on its application and use within a company:

- **Explicit Cost of Capital**: Explicit cost is the rate that the firm pays to procure financing. This is the direct cost of raising capital through debt or equity financing. It includes interest payments on loans, dividends to shareholders, and other fees associated with raising capital.
- **Implicit Cost of Capital**: Implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be foregone if the projects presently under consideration by the firm were accepted. For example, if a company decides to use retained earnings instead of issuing new equity, the implicit cost is the return that the shareholders could have earned elsewhere.
- **Historical Cost of Capital**: Historical cost is the cost which has already been incurred for financing a particular project. It is based on the actual cost incurred in the previous project.
- **Average Cost of Capital (Weighted Average Cost of Capital):** Average cost of capital is the weighted average cost of each component of capital employed by the company. It considers weighted average cost of all kinds of financing such as equity, debt, retained earnings etc.
- **Marginal Cost of Capital**: The marginal cost of capital is the cost of raising additional capital for new investment opportunities. So, marginal cost is the weighted average cost of new finance raised by the company. It is the additional cost of capital when the company goes for further raising of finance.

Practical Application

Consider a company that wants to expand its operations by investing in a new project. To determine the feasibility of the project, it calculates the weighted average cost of capital (WACC). This involves determining

the cost of each component (debt, equity, preferred stock, etc.), weighting them based on their proportions in the capital structure, and computing the average cost.

IMPORTANCE OF COST OF CAPITAL

The **Cost of Capital** is a pivotal (very important) financial metric that holds significant importance in the world of finance. It serves as a guiding light for businesses and organizations, influencing a wide range of financial decisions. The significance of the Cost of Capital and how it impacts various aspects of financial management are discussed below.

Evaluating Investment Opportunities

One of the primary roles of the Cost of Capital is to serve as a benchmark for evaluating investment opportunities. When a company considers a new project or investment, it compares the expected return on that investment to the Cost of Capital. If the expected return exceeds the Cost of Capital, the investment is considered financially viable and may create value for the organization.

Conversely, if the expected return falls short of the Cost of Capital, the investment may not meet the company's financial objectives, and alternative opportunities are explored.

Capital Budgeting and Allocation

In capital budgeting, which involves planning and allocating resources for long-term investments, the Cost of Capital plays a crucial role. It serves as the discount rate used to bring future cash flows to their present value. This ensures that all potential investment projects are evaluated on a consistent basis.

By using the Cost of Capital as the discount rate, organizations can prioritize projects that are most likely to generate a return above the Cost of Capital, thus maximizing shareholder value.

Capital Structure Decisions

The Cost of Capital also influences capital structure decisions. Companies must determine the optimal mix of debt and equity financing to minimize their overall cost of capital. This decision directly affects the organization's risk profile and ability to attract investors.

For example, if the Cost of Capital for debt is lower than the Cost of Capital for equity, a company may choose to use debt financing to lower its overall cost. However, this decision must consider the associated risks, such as the obligation to make interest payments.

Setting Financial Objectives

The Cost of Capital is instrumental in setting financial objectives for a company. It provides insights into the minimum return required by investors and lenders to provide funds to the organization. This information helps in setting realistic financial targets and goals. Additionally, the Cost of Capital serves as a performance benchmark. Companies strive to achieve returns that exceed their Cost of Capital to demonstrate financial efficiency and value creation.

Regulatory Compliance and Reporting

For publicly-traded companies, regulatory bodies often require the disclosure of the Cost of Capital and its components. Accurate reporting of the Cost of Capital ensures transparency and compliance with financial reporting standards.

Investors and stakeholders rely on this information to assess the company's financial health and make informed investment decisions. Therefore, the Cost of Capital holds significance in maintaining trust and confidence in the financial markets.

Conclusion

The Cost of Capital is more than just a financial metric; it is a compass that guides organizations in their financial journey. Whether it is evaluating investments, allocating capital, making financing decisions, or setting financial objectives, the Cost of Capital provides critical insights that shape financial strategies and drive value creation.

CALCULATION OR COMPUTATION OF COST OF CAPITAL
OR
MEASUREMENT OF SPECIFIC COST OF DIFFERENT SOURCES:

(I)   **COST OF DEBT (K_d)**

        i)   Irredeemable Debt (maturity period is unknown)
        ii)   Redeemable Debt (maturity period is known)

(II)   COST OF PREFERENCE SHARES/STOCK

        i)   Irredeemable Debt (maturity period is unknown)
        ii)   Redeemable Debt (maturity period is known)

(III) COST OF EQUITY SHARES/STOCK

        i)   Dividend Price Approach
        ii)   Dividend Price Approach + Growth Approach

(IV) COST OF RETAINED EARNINGS
        – Earning yield method

CALCULATION OF COST OF DEBT

The cost of debt is defined in terms of the required rate of return that the debt investment must yield to protect the shareholders interest.

Note: Interest payable on debentures is the cost of debt. It is a cheaper source because **interest paid on debentures is tax deductible, i.e., you get tax benefit**.

A. Formula for Irredeemable Debt

$$K_d = \frac{I}{NP} \times 100 \qquad \text{[Before tax, i.e., when tax rate is not given]}$$

<div align="center">**OR**</div>

$$K_d = \frac{I(1-t)}{NP} \times 100 \qquad \text{[After tax, i.e., when tax rate is given]}$$

Where,

K_d = **Cost of debt**

I = Interest payment

NP = Net Proceeds from debentures in case of new issue or current market price in case of existing debt

t = Tax rate applicable to the company

Problem:

A company issued Rs. 2,00,000 debentures @ 15% of Rs. 100 each. The company is in the 30% tax bracket.

Calculate cost of debt after tax if debentures are issued at par.

Solution:

Interest (I) = Rs. 2,00,000 x 15% = Rs. 30,000.
Net Proceeds (NP) = Rs. 2,00,000.
Tax rate (t) = 30% = 0.3

Therefore,

$$K_d = \frac{I\,(1-t)}{NP} \times 100$$

$$= \frac{30{,}000\,(1-0.3)}{2{,}00{,}000} \times 100$$

$$= \frac{30{,}000 \times 0.7}{2{,}00{,}000} \times 100$$

$$= \frac{21{,}000}{2{,}00{,}000} \times 100$$

$$= 10.5\%$$

OR (using rate per debenture)

$$K_d = \frac{I\,(1-t)}{NP} \times 100$$

$$= \frac{15\ (1 - 0.3)}{100} \times 100$$

$$= 15 \times 0.7$$

$$= 10.5\%$$

NOTE: Because of the tax benefit, apparently the cost of capital becomes 10.5% instead of 15%. Had there been no tax benefit, we could have used the first formula and the result would have been 15%. So, because of the tax benefit, the cost of debt is cheaper. So the issue of debenture is a wise decision.

B.   Formula for Redeemable Debt

$$K_d = \frac{I + \dfrac{1}{n}\,(RV - NP)}{\dfrac{1}{2}\,(RV + NP)} \times 100 \qquad \text{[Before tax]}$$

OR

$$K_d = \frac{I\,(1 - t) + \dfrac{1}{n}\,(RV - NP)}{\dfrac{1}{2}\,(RV + NP)} \times 100 \qquad \text{[After tax]}$$

Where,

K_d = Cost of debt

I = Interest payment

NP = Net Proceeds from debentures in case of new issue **or** current
market price in case of existing debt

RV = Redeemable/Maturity value of debentures

t = Tax rate applicable to company

n = Life of debentures

Problem:
ABC company issued 12% debentures of Face Value of Rs. 100 for Rs.
60,00,000. Floating charge is 5% on Face Value. Debt is redeemable
<u>at a premium</u> of 10% in 10 years. What will be the cost of debt if the
tax is 50%.

Solution:

Redeemable value (RV) per share:
     Face Value = Rs. 100
   Add: Premium = Rs. 10   (10% of FV of Rs. 100)
                —————————
            Rs. 110
                —————————

Net Proceeds (NP) per share:
     Face Value   = Rs. 100
   Less: Floating charge = Rs. 5   (given)
                    —————————
                   Rs. 95
                    —————————

Interest on debentures (I) = Rs. 60,00,000 x 12% = Rs. 7,20,000

Tax rate (t) = 50% = 0.5

n = 10 yrs.

$$K_d = \frac{I(1-t) + \dfrac{1}{n}(RV - NP)}{\dfrac{1}{2}(RV + NP)} \times 100$$

$$K_d = \frac{12(1 - 0.5) + \dfrac{1}{10}(110 - 95)}{\dfrac{1}{2}(110 + 95)} \times 100$$

$$K_d = \frac{12 \times 0.5 + \dfrac{1}{10} \times 15}{\dfrac{1}{2} \times 205} \times 100$$

$$K_d = \frac{6 + 1.5}{102.5} \times 100$$

$$K_d = \frac{7.5}{102.5} \times 100$$

$K_d = 7.31707317\%$

$K_d = 7.317\%$ (approx)

NOTE: Because of the tax benefit, apparently the cost of capital becomes 7.317% instead of 12% + floating charge. So, because of the tax benefit, the cost of debt is cheaper. So, the issue of debenture is a wise decision.

Problem:

ABC company issued 12% debentures of Face Value of Rs. 100 for Rs. 60,00,000. Floating charge is 5% on Face Value. Debt is redeemable at a discount of 10% in 10 years. What will be the cost of debt if the tax is 50%.

Solution:

Redeemable value (RV) per share:
```
      Face Value =  Rs. 100
  Less:  Discount=  Rs.  10     (10% of FV of Rs. 100)
                  ─────────
                    Rs.  90
                  ─────────
```

Net Proceeds (NP) per share:

Face Value = Rs. 100

Less: Floating charge = Rs. 5 (given)

————————

Rs. 95

————————

Interest on debentures (I) = Rs. 60,00,000 x 12% = Rs. 7,20,000

Tax rate (t) = 50% = 0.5

$$K_d = \frac{I\,(1-t) + \dfrac{1}{n}\,(RV - NP)}{\dfrac{1}{2}\,(RV + NP)} \times 100$$

$$K_d = \frac{12\,(1-0.5) + \dfrac{1}{10}\,(90 - 95)}{\dfrac{1}{2}\,(90 + 95)} \times 100$$

$$K_d = \frac{12 \times 0.5 + \dfrac{1}{10} \times (-5)}{\dfrac{1}{2} \times 185} \times 100$$

$$K_d = \dfrac{6 - 0.5}{92.5} \times 100$$

$$K_d = \dfrac{5.5}{92.5} \times 100$$

$K_d = 5.946\%$ (approx)

<p style="text-align:center">CALCULATION OF COST OF PREFERENCE SHARES</p>

A security sold in a market place promising a fixed rupee return per period is known as a **preference share or preferred stock**. Dividends on preferred stock are cumulative in the sense that if the firm is unable to pay when promised by it, then these keep on getting accumulated until paid, and these must be paid before dividends are paid to ordinary shareholders. The rate of dividend is specified in case of preference shares.

Preference shares are of two kinds such as **redeemable** and **irredeemable** preference shares. In case of **redeemable preference shares the period of repayment is specified** whereas for **irredeemable shares the period of repayment is not specified**. Cost of preference shares (K_p) are the fixed cost bearing securities. The dividend rate is fixed well in advance at the time of their issue.

Note: Dividend payable on preference share is **NOT** tax deductible **rather taxable**.

A.   **Formula for Irredeemable Preference Shares**

$$K_p = \frac{D}{NP} \times 100$$

Where,

K_p = **Cost of preference shares**
D = Dividend
NP = Net Proceeds from the issue of preference shares

Problem:

ABC company issued 12% preference shares of Face Value of Rs. 100 each at par. Floating costs are estimated at 3% of Selling Price. Calculate the cost of preference shares.

Solution:

Dividend (D) = Rs. 12 (12% of Rs. 100)

Net Proceeds:
        Selling Price of Preference shares = Rs. 100 (at par)
    Less: Floating Cost (3% of Rs. 100)   = Rs.   3
                                              ——————
                                                Rs. 97
                                              ——————

$$K_p = \frac{D}{NP} \times 100$$

$$K_p = \frac{12}{97} \times 100$$

$$= 12.37\%$$

NOTE: Here, the cost increased from 12% to 12.37% and this is because of floating charges.

B.   Formula for Redeemable Preference Shares

$$K_P = \frac{D + \frac{1}{n}(RV - NP)}{\frac{1}{2}(RV + NP)} \times 100$$

Where,

K_P **= Cost of preference shares**

D = Dividend

NP = Net Proceeds from the issue of preference shares [i.e., Face value + Premium – Discount – Cost of issue (if any)]

RV = Redeemable/Maturity value of preference shares [i.e., (Face value + Premium) or (Face value – Discount)]

n = years of maturity

Problem:

ABC company issued 9% preference shares of Rs. 100 each at par redeemable at 10% premium after 10 years. Calculate the cost of preference shares.

Dividend (D) = Rs. 9
Years of maturity (n) = 10 years
Net Proceeds (NP) = Rs. 100

Redeemable Value (RV):
$\qquad$ Face Value per Preference Share = Rs. 100
$\quad$ Add: Premium per Preference Share = Rs. 10 (10% of Rs. 100)
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ─────
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Rs. 110
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ─────

$$K_P = \frac{D + \dfrac{1}{n}(RV - NP)}{\dfrac{1}{2}(RV + NP)} \times 100$$

$$K_P = \frac{9 + \dfrac{1}{10}(110 - 100)}{\dfrac{1}{2}(110 + 100)} \times 100$$

$$K_P = \cfrac{9 + \cfrac{1}{10} \times 10}{\cfrac{1}{2} \times 210} \times 100$$

$$K_P = \cfrac{9 + 1}{105} \times 100$$

$$K_P = \cfrac{10}{105} \times 100$$

$$K_P = 9.52\%$$

CALCULATION OF COST OF EQUITY SHARES

The cost of equity capital is the minimum rate of return that the firm must earn on the equity financed portion of an investment project in order to leave unchanged the market price of the stock.

Note: This dividend payment is totally in the discretion of Directors of the company, it is not mandatory to pay a dividend every year to the equity shareholders. It totally depends upon the amount of profit earned by the company. From profit, first debenture holders get their interest as it must be given at a fixed rate, then dividend to preference shareholders must be given at a fixed rate, then company may retain some profit as retained earnings and if after that any profit remains, then to keep equity shareholders interested and motivated the

directors of the company can declare dividend to equity shareholders. Since it is not fixed, the calculation of cost of equity shares is different as compared to that of debt and preference shares.

A. Formula for Dividend/Price Approach

$$K_e = \frac{D}{MP} \times 100$$

Where,

K_e = Cost of equity shares
D = Dividend
MP = Market Price of equity shares

Problem:

ABC company paid a dividend of Rs. 5.67 per share on its equity capital. The current market price per share is Rs. 66. Find the cost of Equity.

Dividend (D) = Rs. 5.67
Market Price (MP) = Rs. 66

$$K_e = \left(\frac{D}{MP}\right) \times 100$$

$$K_e = \left(\frac{5.67}{66}\right) \times 100$$

$$K_e = 0.0859 \times 100$$

$K_e = 8.59\%$.

B.   Formula for Dividend/Price + Growth Approach

$$K_e = \left(\frac{D}{MP} + G \right) \times 100$$

Where,

K_e = **Cost of equity shares**
D = Dividend
G = Growth
MP = Market Price of equity shares

Problem:

ABC company paid a dividend of Rs. 5.67 per share on its equity capital. The growth rate is expected to be 9% in the future. The current market price per share is Rs. 66. Find the cost of Equity.

Dividend (D) = Rs. 5.67
Market Price (MP) = Rs. 66
Growth (G) = 9% = 0.09

$$K_e = \left(\frac{D}{MP} + G \right) \times 100$$

$$K_e = \left(\frac{5.67}{66} + 0.09 \right) \times 100$$

K_e = (0.0859 + 0.09) x 100

K_e = 0.1759 x 100.

K_e = 17.59%

NOTE: Because of the growth rate, the cost of equity is higher than in the previous case.

Capital Asset Pricing Model (Cost of equity calculation method)

C.   Formula of Capital Asset Pricing Model

Expected Return or Cost of Equity (Ke) = rf + β(rm – rf)

Where:

- Ke → Cost of Equity (or Expected Return)
- rf → Risk-Free Rate
- β → Beta
- (rm – rf) → Equity Risk Premium (ERP)

What is the Full-Form CAPM Equation?

The capital asset pricing model (CAPM) equation is composed of three components:

1. Risk-Free Rate (rf) → The return received from risk-free investments — most often proxied by the 10-year treasury yield
2. Beta (β) →The measurement of the volatility (i.e. systematic risk) of a security compared to the broader market

3. Equity Risk Premium (ERP) → The incremental return received from investing in the market above the risk-free rate (rf, as described above)

Component 2. Beta (β)

In corporate finance, beta (β) measures the systematic risk of a security compared to the broader market (i.e. non-diversifiable risk).

The beta of an asset is calculated as the covariance between expected returns on the asset on the market, divided by the variance of expected returns on the market.

The relationship between beta (β) and the expected market sensitivity is as follows:

- $\beta = 0$: No Market Sensitivity
- $\beta < 1$: Low Market Sensitivity
- $\beta = 1$: Same as Market (Neutral)
- $\beta > 1$: High Market Sensitivity
- $\beta < 0$: Negative Market Sensitivity

For instance, a company with a beta of 1.0 would expect to see returns consistent with the overall stock market returns. So if the market has gone up by 10%, the company should also see a return of 10%.

But if that company were to have a beta of 2.0, it would expect a return of 20%, assuming the market had gone up by 10%.

CAPM Calculation Example

Suppose we're computing the cost of equity (ke) using the CAPM given the following set of assumptions:

CAPM Exercise Assumptions

- Risk-Free Rate (rf) = 3.0%
- Beta (β) = 0.8
- Expected Market Return (rm) = 10.0%
- Equity Risk Premium (ERP) = 10.0% − 3.0% = 7.0%

By entering the provided assumptions into the CAPM formula, we arrive at a cost of equity (ke) of 8.6%.

Therefore, expected return or Cost of Equity (Ke) = 3% + 0.8 (10% − 3%) = 8.6%

GORDON'S MODEL (to calculate cost of Equity)

The Gordon Growth Model (GGM) provides a way to estimate the cost of equity capital for a company, particularly when the company pays dividends. It is based on the idea that the value of a stock is the present value of all future dividends. By rearranging the GGM formula, we can derive the cost of equity. This model simplifies valuation by assuming a constant dividend growth rate, which can be useful but also limits its applicability in real-world scenarios.

Key Implications for Cost of Equity:

- **Direct Relationship with Dividends:** The cost of equity is directly tied to the expected dividend and its growth rate. If a company's dividend payout increases or its growth rate rises, the cost of equity, according to the GGM, will also increase.
- **Impact of Growth Rate:** The model highlights the importance of the dividend growth rate (g) on the cost of equity (ke). If the growth rate is higher, the cost of equity will also be higher, as

investors demand a greater return for the risk associated with higher growth.
- **Constant Growth Assumption:** The GGM assumes a constant dividend growth rate indefinitely. This simplification can be unrealistic as dividend growth rates often change over time.
- **Risk Assessment:** The Gordon Model suggests that the cost of equity is higher for companies with higher growth rates, reflecting the increased risk perceived by investors.
- **Comparison with Market Price:** By calculating the intrinsic value of a stock using the GGM and comparing it to the market price, investors can assess whether a stock is undervalued or overvalued.

The Gordon formula for calculation of Cost of Equity (Ke):

$$K_e = \frac{D_1}{P_0} + G$$

Where,

Ke = Cost of Equity Capital or Equity Capitalization rate (the rate of return
    required by the shareholders)

D_1 = Expected dividend per share in the next period.

P_0 = Current market price per share.

G = Constant growth rate of dividend.

Limitations:

- **Constant Growth Assumption:** The assumption of constant growth is a major limitation. In reality, companies experience fluctuating growth rates.
- **Not Applicable to All Companies:** The model is not suitable for companies that do not pay dividends or have volatile dividend patterns.
- **Ignore Other Factors:** The GGM primarily focuses on dividends and growth, potentially overlooking other factors that influence a company's value and cost of equity, such as risk-free rate, beta, and market conditions.

Despite its limitations, the Gordon Growth Model remains a valuable tool for understanding the relationship between dividends, growth, and the cost of equity, particularly for companies with stable dividend policies.

CALCULATION OF COST OF RETAINED EARNINGS

NOTE: Retained earnings are kept in the company, so why do we need to find out the cost of retained earnings? The answer is had there been no retained earnings kept by the company and all remaining profits are distributed to equity shareholders after the payment of interest to debentureholders and dividend to preference shareholders, then the equity shareholders would have the option of reinvesting this money in the equity shares of the company and then the company has to again calculate the cost of equity for that. So, the calculation of cost of retained earnings is for the same.

In other words, retained earnings also have opportunity cost. Opportunity cost of retained earnings is the other rate of return which they can get by investing the after tax dividends in other alternative opportunities.

Formula:

$$K_r = K_e (1 - t)(1 - b) \times 100$$

Where,

K_r = Cost of retained earnings
K_e = Cost of equity shares
t = Tax rate
b = Cost of issuing new securities or brokerage rate

Problem:

The cost of equity of a company is 15%, tax rate of the shareholders is 40%, and the expenses in the form of commission is 3% of the invested in share. The company proposes to utilize the remaining earnings to the extent of Rs. 3,00,000. Find out the cost of retained earnings.

$$K_r = K_e (1 - t)(1 - b) \times 100$$

K_r = 0.15 (1 − 0.4)(1 − 0.03) x 100

K_r = 0.15 (1 − 0.4)(1 − 0.03) x 100

K_r = 0.15 x 0.6 x 0.97 x 100

K_r = 0.0873 x 100

K_r = 8.73%

WEIGHTED AVERAGE COST OF CAPITAL (W.A.C.C.)

The Weighted Average Cost of Capital (WACC) represents the average rate a company expects to pay to finance its assets through a mix of debt and equity. It's a crucial financial metric used to determine the minimum rate of return a company needs to earn on its investments to satisfy its investors. Essentially, it's the cost a company pays to raise capital from various sources.

Problem:

The equity shares of a company are quoted as Rs. 105. The company plans to declare a dividend of Rs. 10 per share. The growth rate of the dividend is 5%. The tax rate is 50%. Calculate the W.A.C.C. when the capital structure of the company as on 31st March, 2024, shows the following:

Equity share capital 9,00,000 shares of Re. 1 each	= Rs. 9,00,000
10% Preference Share	= Rs. 6,00,000
10% Debentures	= Rs. 5,00,000

Solutions:

a)   Cost of Equity Capital:

$$K_e = \left(\frac{D}{MP} + G \right) \times 100$$

$$K_e = \left(\frac{10}{105} + 0.05 \right) \times 100$$

$$K_e = 14.52\%$$

b)   Cost of Preference Share Capital:

$$\mathbf{K_p = \frac{D}{NP} \times 100}$$

D = 10% of Rs. 6,00,000 = Rs. 60,000, NP = Rs. 6,00,000

$$K_p = \frac{60,000}{6,00,000} \times 100$$

$$= 10\%$$

c)   Cost of Debentures:

$$\mathbf{K_d = \frac{I(1-t)}{NP} \times 100}$$

I = 10% of Rs. 5,00,000, NP = Rs. 5,00,000, t = 50% = 0.50

$$K_d = \frac{50,000\ (1 - 0.50)}{5,00,000} \times 100$$

$$= \frac{50,000 \times 0.50}{5,00,000} \times 100$$

$$= 5\%$$

Computation of Weighted Average Cost of Capital (W.A.C.C.)

Sources of Funds (a)	Amount (Rs.) (b)	Weights (c) = $\dfrac{(b)}{20,00,000}$	After Tax Cost % (d)	Weighted Cost % (e) = (c) x (d)
Eq. Sh. Capital	9,00,000	$\dfrac{9,00,000}{20,00,000}$ = 0.45	14.52	0.45 x 14.52 = 6.53
Pref. Sh. Capital	6,00,000	$\dfrac{6,00,000}{20,00,000}$ = 0.30	10.00	0.30 x 10.00 = 3.00
Debentures	5,00,000	$\dfrac{5,00,000}{20,00,000}$ = 0.25	5.00	0.25 x 5.00 = 1.25
	20,00,000	1.00	29.52	**Total** = **10.78**

Therefore, Weighted Average Cost of Capital (W.A.C.C.) is **10.78.**

MARGINAL COST OF CAPITAL

The Marginal Cost of Capital (MCC) is the cost of raising an additional unit of capital. It represents the rate of return that a company must earn on its investments to maintain its current market value. In other words, it's the minimum return required to justify the cost of new capital.

Problem:

MM Ltd has the following cost of capital along with the indicated Book Value and Market Value weights:

Type of Capital	Cost %	Book Value Weight	Market Value weight
Equity Shares	0.18	0.50	0.58
Preference Shares	0.15	0.20	0.17
Long-term Debt	0.07	0.30	0.25
		————————	————————
		1.00	1.00

a)   Calculate the weighted average cost of capital (W.A.C.C.) under

book value and market value weights.

b)   **Calculate the W.A.C.C. using marginal cost if they intend to raise 50% long-term debt, 35% preference share, and 15% equity shares to raise additional funds.**

Solutions:

a)

Computation of **W.A.C.C.** using Book Value weights

Sources of Capital (1)	Book Value Weight (2)	Cost (3)	Total Cost (4) = (2) x (3)
Equity Shares	0.50	0.18	0.09
Preference Shares	0.20	0.15	0.03
Long-term Debt	0.30	0.07	0.021 ---------- – 0.141

Therefore, **W.A.C.C.** using Book Value weights = 0.141 = 14.1%

Computation of **W.A.C.C.** using Market Value weights

Sources of Capital	Market Value	Cost	Total Cost

(1)	Weight (2)	(3)	(4) = (2) x (3)
Equity Shares	0.58	0.18	0.1044
Preference Shares	0.17	0.15	0.0255
Long-term Debt	0.25	0.07	0.0175
			——————
			0.1474

Therefore, **W.A.C.C.** using Market Value weights = 0.1474 = 14.74%

b)

Computation of **W.A.C.C.** using Marginal Cost

Sources of Capital (1)	Weight (2)	Cost (3)	Total Cost (4) = (2) x (3)
Equity Shares	0.15	0.18	0.027
Preference Shares	0.35	0.15	0.525
Long-term Debt	0.50	0.07	0.035
			——————
			0.1145

Therefore, **W.A.C.C.** using Marginal Cost = 0.1145 = 11.45%

Difference between Marginal Cost of Capital and Weighted Average Cost of Capital

While both MCC and Weighted Average Cost of Capital (WACC) are used to evaluate the cost of capital, there are key differences between them:

Items	MCC	WACC
Definition	Cost of raising an additional unit of capital	Average cost of capital for the entire company
Purpose	Evaluate new investment opportunities	Evaluate overall cost of capital
Calculation	Based on cost of new capital	Based on the existing capital structure