Cost of Capital

→ Cost of Capital is the cost of acquiring the funds
→ On raising funds from the various sources, the business has to pay some additional amount in the form of interest, apart from the principal itself.
→ This additional amount is nothing but the cost of using the capital

Definition : Cost of Capital is defined as the financing costs a company that has to pay when borrowing money

→ The cost of capital is the minimum rate of return that the company must earn on its investment to fulfill the expectations of the investors
→ Cost of capital is also referred to as the discounting rate to determine the present value of return
→ Cost of Capital is also referred as breakeven rate, minimum rate, cut off rate, target rate, hurdle rate, standard rate

Importance of Cost of Capital :

→ It is very important to companies who need capital to fund their business
→ The cost of Capital helps businesses in evaluating all investment opportunities
→ The cost of capital can also help in taking decisions in selecting various sources of capital like debt, equity or others. In other words it is vital in designing the optimal capital structure of the firm
→ Cost of Capital can be used to evaluate the progress of on going projects and investments by matching up the progress of those investments against the cost of capital
→ Cost of Capital is measured separately for different sources of capital
1) Cost of debenture
2) Cost of equity share capital
3) Cost of preference share capital
4) Cost of retained earnings

Definition :
→ The cost of capital is the minimum required rate of earning or the cut off rate of expenditure.
→ so, it is required rate of return on invested funds

1) **Cost of Debt** :

Irredeemable
↓
Maturity period not known

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

K_d = cost of debt
I = Interest
T = tax
NP = net proceeds (after sale value, value after expenses) amount received

Redeemable
↓
Maturity period is known

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

RV = redeemable value, (face value)
n = no. of period (maturity period)

Q1) n = 20yrs, par value = 1000 Rs
fees = Rs 25, discount = Rs 20
Coupon rate = 9 %, Tax = 40 %

a) Irredeemable

$$K_d = \frac{90(1-0.40)}{955}$$

$I = 1000 \times 9\% = 90$

$NP = 1000 - 25 \text{ fees} - 20 \text{ dis} = 955$

b) Redeemable

$$K_d = \frac{90(1-0.40) + \frac{1000-955}{20}}{\frac{1000+955}{2}} = \frac{56.25}{977.5} = 0.0575 \times 100 = \boxed{5.75\%}$$

2) Cost of preferred stock

Irredeemable

$$K_p = \frac{P_d}{P_0}$$

Redeemable

$$K_p = \frac{P_d + \frac{RV - P_0}{n}}{\frac{RV + P_0}{2}}$$

K_p = cost of preference stock
P_0 = price of stock (NP)
P_d = Preference dividend
RV = redeemable value (par value, face value)

Q2) Par value = 100 Rs , dividend = 11%.
Sale price = 101 Rs
flotation cost = Rs 9

Irredeemable

$$K_p = \frac{P_d}{P_0}$$

$P_d = 1000 \times 11\%$

P_0 = cost of preferred stock
= 101 − flotation cost 9
= 92 Rs

$$K_p = \frac{11}{92}$$

if n = 20, Redeemable

$$K_p = \frac{P_d + \frac{R_V - P_0}{n}}{\frac{RV + P_0}{2}} = \frac{11 + \frac{100 - 92}{20}}{\frac{100 + 92}{2}}$$

3) Cost of equity

without growth

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

with growth

$$K_e = \frac{D_1}{P_0} + G_1$$

K_e = cost of equity
D_1 = dividend of next year
P_0 = current market price of the stock
G_1 = growth

Q3)

Firm	Current market Price (Rs)	growth	D_1	under price per share (Rs)	flotation cost (Rs)
A	50	8%	2.25	2	1
B	20	4%	1.00	0.5	1.50

$$K_e = \frac{D_1}{P_0} + G \quad A = \frac{2.25}{50} + 0.08$$

$$A = 0.045 + 0.08 = \boxed{12.5\%}$$

4) Cost of retained earnings

$$K_e = K_R$$

Cost of new share of common stock

$$K_n = \frac{D_1}{N_n} + g$$

K_n = cost of new share (N_n)

$$K_n = \frac{D_1}{P_0(1 - \text{flotation cost})} + g$$

$$K_n = \frac{2.25}{50 - 3} + 0.08$$

$$\frac{2.25}{47} + 0.08 = 0.47 + 0.08 = 0.127 \times 100 = \boxed{12.78\%}$$

Weighted Average Cost of Capital (WACC)

Definition: The weighted average cost of capital is the rate that a company is expected to pay on average to all its security holder to finance its assets

Formula:

$$WACC = W_e \cdot K_e + W_p \cdot K_p + W_d \cdot K_d (1-t)$$

W_e = weight of equity
K_e = cost of equity
W_d = ~~cost~~ weight of debt
K_d = cost of debt
W_p = weight of preference
K_p = cost of preference
t = tax rate

Q4)

		Capital
Cost of debenture	= 10%	600000
cost of preference	= 14%	400000
Cost of equity	= 16%	10,00,000

Security	Amt	Proportion	Cost	Weighted Cost
Debenture	600000	0.3	0.1	
Preference	400000	0.2	0.14	
equity	1000000	0.5	0.16	
	2000000	1.00		

D = 600000/2000000

P = 400000/2000000

$0.5 \times 0.16 + 0.2 \times 0.14 + 0.3 \times 0.1$

$WACC = 0.08 + 0.028 + 0.03 = 0.138 \times 100 =$ **13.8%**

Q5)

Security	Proportion	Cost
Debt	30%	11%
Preference	10%	9%
common stock	60%	14%

$WACC = 0.6 \times 0.14 + 0.1 \times 0.09 + 0.3 \times 0.11(1-0.4)$

$0.084 + 0.009 + 0.0198$

$= 0.1128 \times 100$

11.28%

a) Tax rate = 40%,
b) Tax rate = 35%
c) Tax rate = 25%