

# Cost of Capital

(WACC) → COC  $K_0$

(Kd) Debenture

P3C (Kp)

ESC (Ke)

RE (K<sub>r</sub>)

Irredeemable

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

I : FY x %

PD : FV x %

NP : (FV + P - D)

- FC

Irredeemable

$$\frac{PD}{NP} \times 100$$

Redeemable

Approximation

$$\frac{I(1-t) + \frac{RV-NP}{n}}{RY+NP} \times 100$$

IF ITS P3C

then replace  $I(1-t)$  with PD

IF Convertible Debenture

RY means value of equity share at redemption.

$$K_e = \left( \frac{D_1}{P_0} \times 100 \right) + g$$

$$K_e - g = \frac{D_1}{P_0} \times 100$$

$$P_0 = \frac{D_1}{K_e - g} \times 100$$

CAPM

b x r

→ 12 times

n = 6 years

P<sub>6</sub>

D<sub>7</sub>

cost capital

Irredeemable

a) Dividend

$$\frac{D_1}{P_0} \times 100 - FC$$

b) Earning:

$$\frac{E_1}{P_0} \times 100 - FC$$

c) Gordon's

$$\left( \frac{D_1}{P_0} \times 100 \right) + g - FC$$

d) CAPM

$$R_f + \beta (R_m - R_f)$$

D<sub>1</sub> = Expected Div  
D<sub>0</sub> + g

E<sub>1</sub> = Expected EPS

P<sub>0</sub> = Current mps

g = growth

b x r

retention % ROE %

R<sub>f</sub> : Risk free Return

R<sub>m</sub> : Return on mkt portfolio

β : Beta

R<sub>m</sub> - R<sub>f</sub> : Premium on mkt portfolio

same as K<sub>e</sub>  
ignore FC

WACC

Par By W Cost WACC

1

Par my W Cost WACC

1

By my

ESC ?

RE ?

←  
ES x mps

# Cost of Capital



- In which ratio capital should be raised
- Capital structure.

- Which project to invest
- Investment Decision

• Once Rs.10,00,000 raised, we will learn to calculate cost of Rs.10,00,000 i.e. cost of capital.

Example:

Particulars	Capital	%	Cost
15% Bank loan	600,000	15%	90,000
10% Debenture	400,000	10%	40,000
	10,00,000		130,000

(Capital)

(Cost)

∴ Overall

$$\text{Cost of Capital} = \frac{130,000}{10,00,000} \times 100 = 13\%$$

"OR"

Particulars	Capital	Ratio	%	Cost
15% Bank loan	600,000	0.6	15	9
10% Debenture	400,000	0.4	10	4
	10,00,000	1		13

Overall cost of Capital  
Weighted Avg Cost of Capital (WACC)  $K_0$

Debt ↓ $K_d$	Preference shares $K_p$	Equity shares $K_e$	Retained Earning $K_r$
a) Irredeemable b) Redeemable	a) Irredeemable b) Redeemable	a) Irredeemable	

1. Cost of Irredeemable Debenture

$$K_d = \frac{\text{Interest (1-tax rate)}}{\text{Net Proceeds}} \times 100$$

$$\frac{\text{Out: Cost}}{\text{In: Capital}} \times 100$$

Interest : Face value x % of Interest

Net Proceeds:

Face value	x	
+ Premium	x	
- Discount	(x)	
Issue value	x	
- Floatation Cost	(x)	( Issue value x Floatation cost %)
	x	

Explanation for Interest (1-tax rate)

10% Debt of Rs. 100

Particulars	without Debt		with Debt
EBIT	200		200
- Interest	-	cost = 10 →	(10) (100x10%)
EBT	200		190
- Tax @ 30%	(60)	Tax saving = 3 →	(57)
EAT	140	Net cost = 7 →	133

Interest (1-t)

10 (1-0.3)

Rs. 7

**Floatation Cost:**

company → Public

- Underwriter commission
- Prospectus
- Advt.
- Listing fees.

Floatation Cost:

Cost incurred to raise money from public.

Example:

X Ltd wants to issue 10% debenture of face value Rs.100  
Tax rate = 30%.

Calculate cost of debenture ( $k_d$ ) if issue is at

- Par
- 10% Premium
- 6% Discount
- 4% Premium & Rs.2 Floatation cost
- 3% Discount & 1% Floatation cost.

Solution:

$$k_d = \frac{\text{Interest (1-Tax rate)}}{\text{Net Proceeds}} \times 100.$$

$$\text{Interest (1-Tax rate)} = (100 \times 10\%) - (1 - 0.3) = 7$$

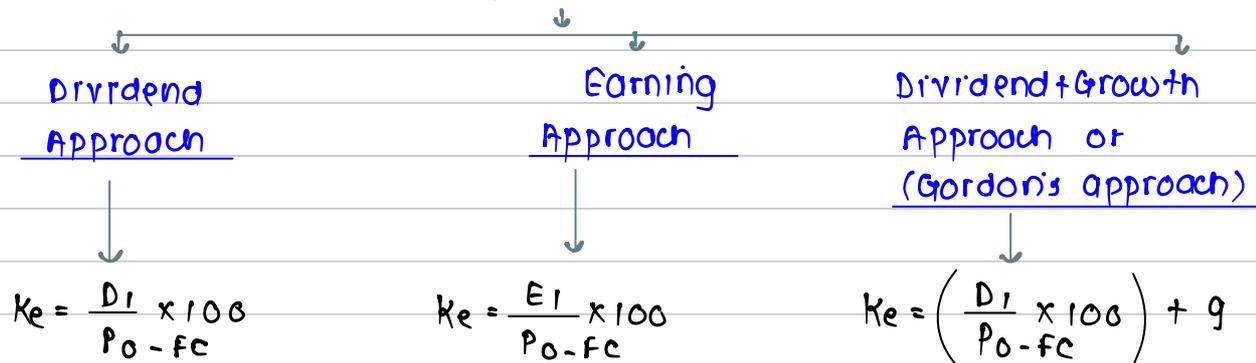
Case	(a) $I(1-t)$	(b) Net Proceeds	$\frac{a}{b} \times 100$ $k_d$
a	7	100	7%
b	7	110 (100+10%)	6.36%
c	7	94 (100-6%)	7.45%
d	7	102 (100+4%) - 2	6.86%
e	7	96.03 (100-3%) - 1%	7.29

## 2. Cost of Irredeemable Preference Shares.

$$K_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} \times 100$$

## 3. Cost of Equity Shares (Ke)

Cost of Equity (Ke) means return expected by shareholder.



$D_1$  = Expected Dividend

Dividend paid (last year) + Growth or  $D_0 + g$

$E_1$  = Expected EPS

$P_0$  = Current market Price (MPS)

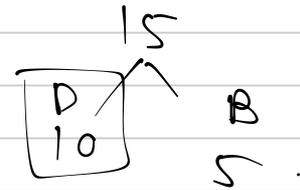
$F_c$  = Floatation Cost

$g$  = Growth rate

$$g = b \times r$$

$b$  = Retention Ratio

$r$  = Return on Equity .

Example:current market price ( $P_0$ ) = 100Expected Dividend ( $D_1$ ) = 10Expected EPS ( $E_1$ ) = 15Growth rate ( $g$ ) = 3%calculate  $k_e$ ?Solution:

↓

Dividend Approach.

$$\frac{10}{100} \times 100$$

10%

↓

Earning Approach.

$$\frac{15}{100} \times 100$$

15%

↓

Gordon's dividend growth approach.

$$\left( \frac{10}{100} \times 100 \right) + 3$$

13%

 $P_0 : 100$  $D_1 : 10$  $P_1 : 103$  $(100 + 3\%)$ 

113

$$\frac{13}{100} \times 100 = 13\%$$

Explanation of  $g = b \times r$

Investment Per share = 1000

Return on equity = 10%

Dividend Payout: company

Payout(%)

A : 100%

B : -

C : 50%

b.

Retention Ratio

-

100%

50%

Particulars

A

B

C

Year 1:

EPS (Inv +  $\times 10\%$ )

100

100

100

Dividend

100

-

50

Retained Earning

-

100

50

10%

5%

Year 2:

EPS

106

110

105

$[(Inv + RE) \times 10\%]$

$(1000 + 100) \times 10\%$

$(1000 + 50) \times 10\%$

Growth rate:  $b \times r$

$0 \times 0.10$

$1 \times 0.10$

$0.5 \times 0.10$

-

0.10

0.05

or 10%

or 5%

**Question 19. (PP1)**

Gamma Limited has 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 capital, COMPUTE the weighted average cost of capital?

Because company is 100% equity financed.

Cost of equity = WACC.

$$k_e = \frac{D_1}{P_0} \times 100$$

$D_1$  = Expected Dividend

$P_0$  = current mps .

$$= \frac{0.27}{1.5} \times 100$$

$$= 18\%$$

**Question 20. (PP2)**

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.

1. Cost of Debenture: Interest % (1-t)

Redeemable:  $15 (1-0.3) = 10.5\%$

Convertible:  $10 (1-0.3) = 7\%$

2. WACC:

Particulars	Capital	Ratio	Cost (%)	WACC
ESC	6500,000	0.619	16.30	10.09
12% PSC	1200,000	0.114	12	1.37
15% RD	2000,000	0.190	10.5	2
10% CD	800,000	0.076	7	0.53
	10500,000	1		13.99

## Cost of Debenture

### Irredeemable

$$K_d = \frac{I(1-t)}{\text{Net Proceeds}} \times 100$$

### Redeemable

### Approximation Method

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

$I$  = Interest

$t$  = Tax Rate

$RV$  = Redemption value

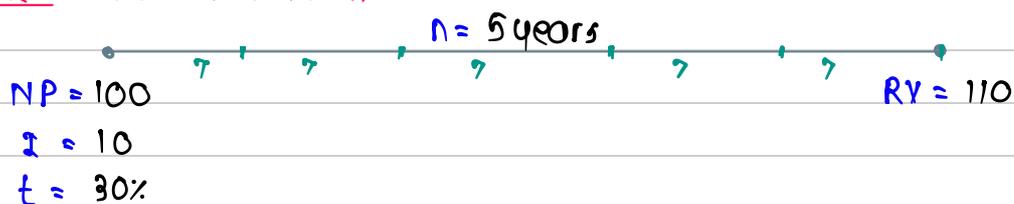
$NP$  = Net Proceeds

$n$  = Remaining life of debenture

### Yield to maturity (YTM) approach.

IRR is  $K_d$ .

### Example: (10% Debenture)



$$\begin{aligned}
 & \frac{10(1-0.3) + \left(\frac{110-100}{5}\right)}{\frac{110+100}{2}} \times 100 \\
 & \frac{7 + 2}{105} \times 100 \\
 & = 8.57\%
 \end{aligned}$$

**Question 1. (Illustration 1)**

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?

$$\begin{aligned} K_d &= \frac{\text{Interest (1-tax rate)}}{\text{Net Proceeds}} \times 100 \\ &= \frac{(100 \times 12\%) (1-0.35)}{94} \times 100 \\ &= \frac{7.8}{94} \times 100 \\ &= 8.30\% \end{aligned}$$

A company issued 10,000, 10

**Question 2. (Illustration 2)**

A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2023 to be matured on 1.4.2028. The debentures will be redeemed on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

$$n = 5 \text{ years.}$$

$$NP = 100 + 10\% = 110$$

$$RV = 100$$

$$I = 10$$

$$t = 0.35$$

$$\begin{aligned}
 K_d &= \frac{I(1-t) + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100 \\
 &= \frac{10(1-0.35) - \frac{100-110}{5}}{\frac{100+110}{2}} \times 100 \\
 &= \frac{6.5 - 2}{105} \times 100 \\
 &= 4.29\% .
 \end{aligned}$$

**Question 3. (Illustration 3)**

A company issued 10,000, 10% debentures of ₹ 100 each at par on 1.4.2018 to be matured on 1.4.2028. The company wants to know the cost of its existing debt on 1.4.2023 when the market price of the debentures is ₹ 80. COMPUTE the cost of existing debentures assuming 35% tax rate.

$$\begin{array}{ccc}
 \underline{1-4-18} & \xrightarrow{5} & \underline{1-4-23} & & n = 5 \text{ years} & & \underline{1-4-28} \\
 NP = 80 & & & & & & RV = 100 \\
 I = 10 & & & & & & \\
 t = 0.35 & & & & & & 
 \end{array}$$

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

$$K_d = \frac{10(1-0.35) + \frac{100-80}{5}}{\frac{100+80}{2}} \times 100$$

$$= \frac{6.5 + 4}{90} \times 100$$

$$= 11.67\%$$

XYZ & Co. issues 2,000 10%

**Question 6. (Illustration 6)**

XYZ & Co. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. CALCULATE the cost of preference shares.

$$k_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} \times 100$$

$$= \frac{100 \times 10\%}{95} \times 100$$

$$= 10.53\%$$

If R Energy is issuing preferred stock

**Question 7. (Illustration 7)**

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

Cost of Preference share:

$$k_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} \times 100$$

$$= \frac{12}{100 - 3\%} \times 100$$

$$= 12.37\%$$

XYZ Ltd. issues 2,000 10% preference

**Question 8. (Illustration 8)**

XYZ Ltd. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. The company proposes to redeem the preference shares at the end of 10 th year from the date of issue. CALCULATE the cost of preference share?



$$k_p = \frac{PD + \left(\frac{RV - NP}{n}\right)}{\frac{RV + NP}{2}} \times 100$$

$$k_p = \frac{10 + \left(\frac{100 - 95}{10}\right)}{\frac{100 + 95}{2}} \times 100$$

$$k_p = \frac{10.5}{97.5} \times 100$$

$$= 10.77\%$$

A company has paid dividend

**Question 9. (Illustration 9)**

A company has paid dividend of ₹ 1 per share (of face value of ₹ 10 each) last year and it is expected to grow @ 10% every year. CALCULATE the cost of equity if the market price of share is ₹ 55.

Cost of Equity:

$$k_e = \left( \frac{D_1}{P_0} \times 100 \right) + g$$

$$= \left\{ \frac{(1+10\%)}{55} \times 100 \right\} + 10$$

$$= 12\%$$

$D_0 = 1$	+ 10%	$D_1 = 1.1$
$P_0 = 55$	+ 10%	$P_1 = 60.5$
	→	61.6
	$\frac{6.6}{55} \times 100$	
	= 12%	

**Question 13. (Illustration 13)**

Face value of equity shares of

Face value of equity shares of a company is ₹10, while current market price is ₹200 per share. Company is going to start a new project, and is planning to finance it partially by new issue and partially by retained earnings. You are required to CALCULATE cost of equity shares as well as cost of retained earnings if issue price will be ₹190 per share and floatation cost will be ₹5 per share. Dividend at the end of first year is expected to be ₹10 and growth rate will be 5%.

Cost of Equity:

$$k_e = \left( \frac{D_1}{P_0 - f_c} \times 100 \right) + g$$

$$= \left( \frac{10}{190 - 5} \times 100 \right) + 5$$

$$= 10.41\%$$

Cost of Retained Earning

$$k_r = \left( \frac{D_1}{P_0} \times 100 \right) + g$$

$$= \left( \frac{10}{200} \times 100 \right) + 5$$

$$= 10\%$$

ABC Company provides

**Question 14. (Illustration 14)**

ABC Company provides the following details:

$D_0 = ₹ 4.19$        $P_0 = ₹ 50$        $g = 5\%$

CALCULATE the cost of retained earnings.

$$k_r = \left\{ \frac{D_1}{P_0} \times 100 \right\} + g$$

$$= \left\{ \frac{(4.19 + 5\%)}{50} \times 100 \right\} + 5$$

$$= 13.8\%$$

Cost of equity of a company is 10.41%

**Question 16. (Illustration 16)**

Cost of equity of a company is 10.41% while cost of retained earnings is 10%. There are 50,000 equity shares of ₹10 each and retained earnings of ₹15,00,000. Market price per equity share is ₹50. Calculate WACC using market value weights if there are no other sources of finance.

Weighted Average Cost of Capital:

Particulars	Book Value	Market Value	(Ratio) weights	Cost (%)	WACC
ESC	500,000	625,000	0.25	10.41	2.60
Retained Earning	1500,000	1875,000	0.75	10	7.5
	20,00,000	25,00,000	1		10.1

$(50,000 \times 50)$

Ratio of  
Book value

33 min .

CALCULATE the WACC using

**Question 17. (Illustration 17)**

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:

Year	(₹)
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 per equity share

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 of ₹ 24 per share.

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

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

(W.N-1): Cost of Debenture: (Kd) (YTM)

$$n = 10$$

$$NP: 105 - 4\% = 100.8$$

$$RV: 100$$

$$I: 100 \times 10\% = 10$$

$$t: 0.30$$

$$I(1-t): 10(1-0.3) = 7$$

Year	Cash Flow	PVF @ 5%	PV	PVF @ 7%	PV
1-10	7	7.722	54.05	7.024	49.17
10	100	0.614	61.40	0.508	50.80
			115.45		99.97
Net Proceeds:			(100.80)		(100.80)
			14.65		(0.83)

$$IRR = 5 + \frac{14.65}{14.65 + 0.83} \times (7 - 5) = 6.89\%$$

(WN-2): Cost of Preference Shares: (YTM)

$n = 10$

NP:  $110 - 2\% = 107.8$

RY: 100

PD:  $100 \times 5\% = 5$

Year	Cash Flow	PVF @ 3%	PV	PVF @ 5%	PV
1-10	5	8.530	42.65	7.772	38.61
10	100	0.744	74.40	0.614	61.40
			117.05		100.01
Net Proceeds:			(107.8)		(107.8)
			9.25		(7.79)

$IRR = 3 + \frac{9.25}{9.25 + 7.79} \times (5 - 3) = 4.09\%$

(WN-3): Cost of Equity:

$K_e = \left\{ \frac{D_1}{P_0} \times 100 \right\} + g$

$= \left\{ \frac{1}{24 - 4} \times 100 \right\} + 5$

$= 10\%$

1. WACC (Book Value):

Particulars	Book			
	Value	Weight	Cost (%)	WACC
Debenture	500,000	0.25	6.89	1.72
PSC	500,000	0.25	4.09	1.02
ESC	10,00,000	0.50	10	5
	20,00,000	1		7.74%

2. WACC (Market Value):

Particulars	Market			
	Value	Weight	Cost (%)	WACC
Debenture (5000 x 105)	525,000	0.151	6.89	1.04
PSC (5000 x 110)	550,000	0.158	4.09	0.65
ESC (100,000 x 24)	24,00,000	0.691	10	6.91
	3475,000	1		8.6%

## Cost of Equity

1. Dividend approach
2. Earning approach
3. Gordon's Growth approach

### 4. CAPM

(Capital Asset Pricing Model.)

$$K_e = R_f + \beta (R_m - R_f)$$

$R_f$  : Risk free return

$R_m$  : Return on market portfolio.

$\beta$  : Beta

$R_m - R_f$  : Market Risk Premium.



$$\begin{aligned}
 K_e &= R_f + \beta (R_m - R_f) \\
 &= 6 + 2 (10\% - 6\%) \\
 &= 6 + 8 \\
 &= 14\%
 \end{aligned}$$

CALCULATE the cost of equity capital

**Question 12. (Illustration 12)**

CALCULATE the cost of equity capital 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%.

Cost of Equity:

$$\begin{aligned}K_e &= R_f + \beta (R_m - R_f) \\&= 10 + 1.75 (15 - 10) \\&= 10 + 8.75 \\&= 18.75\%\end{aligned}$$

**Question 15. (Illustration 15)**

ABC Company provides the following details:

$$R_f = 7\% \quad \beta = 1.20 \quad R_m - R_f = 6\%$$

CALCULATE the cost of retained earnings based on CAPM method.

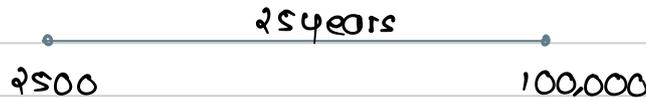
Cost of Equity:

$$\begin{aligned}K_r &= R_f + \beta (R_m - R_f) \\&= 7 + 1.2 \times 6 \\&= 7 + 7.2 \\&= 14.2\%\end{aligned}$$

Institutional Development Bank (IDB)

**Question 4. (Illustration 4)**

Institutional Development Bank (IDB) issued Zero interest deep discount bonds of face value of ₹1,00,000 each issued at ₹2,500 & repayable after 25 years. COMPUTE the cost of debt if there is no corporate tax.



Year	Cash Flow	PVF@15%	PV	PVF@16%	PV
25	1,00,000	0.030	3,000	0.024	2,400
			(2,500)		(2,500)
			500		(100)

$$IRR = 15 + \frac{500}{500 + 100} \times (16 - 15)$$

$$= 15 + 0.83$$

$$= 15.83$$

$$* \frac{1,00,000 (FV)}{2,500 (PV)} = \frac{12.76}{10} =$$

$$\sqrt[12 \text{ times}]{} =$$

$$\begin{aligned} & -1 \\ & \times 1 \\ & \div 25 \text{ (years)} \quad \quad \quad 5 \\ & + 1 \\ & \times = 12 \text{ times} \\ & -1 \\ & \times 100 \end{aligned}$$

$$15.907\%$$

(38 min)

15% convertible debentures of ₹ 100 each

**Question 25. (PP7)**

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 dividend of ₹ 12.76 per share. Five years ago, it paid 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%.

(i) CALCULATE the cost of convertible debentures using the approximation method.

(ii) Use YTM method to CALCULATE cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
PVIF <sub>0.03, t</sub>	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
PVIF <sub>0.05, t</sub>	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
PVIFA <sub>0.03, t</sub>	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
PVIFA <sub>0.05, t</sub>	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 <sub>i, 5</sub>	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
FVIF <sub>i, 6</sub>	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
FVIF <sub>i, 7</sub>	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

1. Cost of Convertible Debenture:

$$\begin{aligned}
 P_0 & \quad n = 6 \\
 NP &= 100 - 5\% = 95 \\
 I &= 100 \times 15\% = 15 \\
 t &= 0.4
 \end{aligned}$$

$$\begin{aligned}
 P_6 & \quad \text{Refer(d)} \\
 RV &= 130.56 \\
 & \text{1 debenture} \rightarrow 2 \text{ ES}
 \end{aligned}$$

a) Cost of Equity (CAPM):

$$\begin{aligned}
 k_e &= R_f + \beta (R_m - R_f) \\
 &= 10 + 1.25(18) \\
 &= 32.5\%
 \end{aligned}$$

b) Growth:

$$\begin{aligned}
 10(1+g)^5 &= 12.76 \\
 (1+g)^5 &= \frac{12.76}{10} \\
 (1+g)^5 &= 1.276 \\
 \text{Growth} &= 5\%
 \end{aligned}$$

c) Value of Equity

$$K_e = \left( \frac{D_1}{P_0} \times 100 \right) + g$$

$$K_e - g = \frac{D_1}{P_0} \times 100$$

$$P_0 = \frac{D_1}{K_e - g} \times 100$$

$$P_6 = \frac{D_7}{K_e - g} \times 100$$

$$= \frac{12.76 (1 + 5\%)^7}{32.5 - 5} \times 100$$

$$= \frac{12.76 \times 1.407}{27.5} \times 100$$

$$= 65.28$$

d) Redemption Value:

$$65.28 \times 2 \text{ shares} = 130.56.$$

e) Cost of Debenture:

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

$$K_d = \frac{15(1-0.4) + \frac{130.56 - 95}{6}}{\frac{130.56 + 95}{2}} \times 100$$

$$= \frac{9 + 5.93}{112.78} \times 100$$

$$= 13.24\%$$

2. Cost of Preference Shares:

$$n = 10$$

$$NP: (100 + 10\%) - 6\% = 103.4$$

$$RX: 100$$

$$PD: 100 \times 5\% = 5$$

Year	Cash Flow	PVF@3%	PV	PVF@5%	PV
1-10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.4	0.614	61.40
			117.05		100.01
			(103.4)		(103.4)
			13.65		(3.39)

$$IRR = 3 + \frac{13.65}{13.65 + 3.39} \times (5 - 3)$$

$$= 3 + 1.6$$

$$= 4.60\%$$

(43 min)

DETERMINE the cost of capital of

**Question 23. (PP5)**

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

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.
- Flotation cost would be calculated on face value.

(WN-1): Cost of Equity:

o) Growth: FV = 14.19  
 PV = 10.60  
 Time = 5 years  
 Growth = 6%

$$\begin{aligned}
 D) K_e &= \left( \frac{D_1}{P_0 - FC} \times 100 \right) + g \\
 &= \left( \frac{15}{125 - 5} \times 100 \right) + 6 \\
 &= 18.5\%
 \end{aligned}$$

(WN-2): Cost of Retained Earning

$$\begin{aligned}
 K_r &= \left( \frac{D_1}{P_0} \times 100 \right) + g \\
 &= \left( \frac{15}{125} \times 100 \right) + 6 \\
 &= 18\%
 \end{aligned}$$

ICA is confused. I 13 ∴ MP3  
 PP5 : Issued price .

(WN-3): Cost of Preference Shares:

$$K_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} \times 100$$

$$= \frac{100 \times 15\%}{105} \times 100$$

$$= 14.29\%$$

(WN-4): Cost of Debenture:

$$n = 11$$

$$\rightarrow NP: 93.75 - (100 \times 2\%) = 91.75 \quad RV: 100$$

$$I: 100 \times 15\% = 15$$

$$t: 0.35$$

₹	₹
<u>company</u>	<u>other</u>
15% Deb.	16% Deb.
Interest: 15	16
Issue = ?	Issue: 100
93.75	

<u>Extra</u>	
₹	₹
<u>company</u>	<u>other</u>
8% Deb.	16% Deb.
Interest: 8	16
Issue = ?	Issue: 100
50	
2 debenture $\times$ 8 = 16.	

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

$$= \frac{15(1-0.35) + \left(\frac{100-91.75}{11}\right)}{\frac{100+91.75}{2}} \times 100$$

$$= \frac{9.75 + 0.75}{95.875} \times 100$$

$$= 10.95\%$$

1. WACC (Book Values):

Particulars	Book			
	Value	Weights	Cost (%)	WACC
Esc	120,00,000	0.615	18.50	11.38
RE	30,00,000	0.154	18	2.77
Psc	36,00,000	0.185	14.29	2.64
Debenture	900,000	0.046	10.95	0.50
	19500000	1		17.29%

2. WACC (Market Value):

Particulars	Book	Market	Weights	Cost (%)	WACC
	Value	Value			
Esc	120,00,000	? 160,00,000	0.655	18.50	12.12
RE	30,00,000	? 40,00,000	0.164	18	2.95
	150,00,000	200,00,000	x		
Psc		3375000	0.138	14.29	1.97
Debenture		1040,000	0.043	10.95	0.47
		24415000	1		17.51

ABC Company's equity share is quoted

**Question 21. (PP3)**

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%.

1. Cost of Equity:

$$k_e = \left( \frac{D_1}{P_0} \times 100 \right) + g$$

$$= \left( \frac{2 + 6\%}{25} \times 100 \right) + 6$$

$$= 14.48$$

2. Cost of Redeemable Debenture:

$n = 12$

NP: 96

RV:  $100 + 12\% = 112$

$I: 100 \times 10\% = 10$

$t: 50\%$

$I(1-t): 10(1-0.5) = 5$

Year	Cash Flow	PVF @ 5%	PV	PVF @ 7%	PV
1-12	5	8.863	44.32	7.943	39.72
12	112	0.557	62.38	0.444	49.73
			106.7		89.45
			(96)		(96)
			10.7		(6.55)

$$IRR = 5 + \frac{10.7}{10.7 + 6.55} \times (7 - 5)$$

$$= 5 + 1.24$$

$$= 6.24\%$$

Masco Limited wishes to raise additional

**Question 22. (PP4)**

Masco Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / Equity mix	3:7
(2)	Cost of debt:	
	Upto ₹ 1,80,000	10% (before tax)
	Beyond ₹ 1,80,000	16% (before tax)
(3)	Earnings per share	₹ 4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate of dividend	10%
(6)	Current market price per share	₹ 44
(7)	Tax rate	50%

You are required to:

- (a) DETERMINE the pattern for raising the additional finance.
- (b) DETERMINE the post-tax average cost of additional debt.
- (c) DETERMINE the cost of retained earnings and cost of equity.
- (d) COMPUTE the overall weighted average after tax cost of additional finance.

a) Pattern for raising the additional finance:

Additional finance: 10,00,000

↓	↓	↓
<u>Debt: 300,000</u>	(3:7)	<u>Equity: 700,000</u>
10% Debt     180,000		Esc     490,000
16% Debt     120,000		RE     210,000
300,000		700,000

b) Post Tax Average Cost of Debt:

10% Debt :  $10 (1 - 0.5) = 5\%$

16% Debt :  $16 (1 - 0.5) = 8\%$

<u>Particulars</u>	<u>Capital</u>	<u>Ratio</u>	<u>Cost (%)</u>	<u>WACC</u>
10% Debt	180,000	0.60	5	3
16% Debt	120,000	0.40	8	3.2
	300,000	1		6.2

c) Cost of Equity | Cost of retained earning:

$D_1 =$  Expected Dividend:

$$\begin{array}{r} \text{EPS} \quad 4 \\ \times \text{Payout ratio} \quad \times 50\% \\ \hline D_0 \quad 2 \\ + \text{Growth} \quad + 10\% \\ \hline D_1 \quad 2.2 \end{array}$$

$$\begin{aligned} K_e / K_r &= \left( \frac{D_1}{P_0} \times 100 \right) + g \\ &= \left( \frac{2.2}{44} \times 100 \right) + 10 \\ &= 15\% \end{aligned}$$

d) WACC:

<u>Particulars</u>	<u>Capital</u>	<u>Weight</u>	<u>Cost</u>	<u>WACC</u>
ESC & RE	700,000	0.7	15	10.5
Debt	300,000	0.3	6.2	1.86
	10,00,000	1		12.36%

RBML is proposing to sell a 5-

**Question 5. (Illustration 5)**

RBML 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 equally over its life. CALCULATE the bond's present value for an investor if he expects a minimum rate of return of 6 per cent?

(WN-1): Table showing Cash Flows:

Year	Opening Balance	Interest Charged @ 8%	Total Int	Int Paid	Principal Paid	Closing Balance
	(a)	(b)	(a+b) (c)	(d)	(e)	(c-d+e)
1	5000	400	5400	400	1000	4000
2	4000	320	4320	320	1000	3000
3	3000	240	3240	240	1000	2000
4	2000	160	2160	160	1000	1000
5	1000	80	1080	80	1000	-

CASH FLOW

Bond's Present value:

Year	Cash flow	PVF @ 6%	PV
1	1400	0.943	1320
2	1320	0.890	1175
3	1240	0.840	1042
4	1160	0.792	919
5	1080	0.747	807
			5263