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  CA Intermediate – Paper 2: Corporate and Other Laws
- Has uploaded over 3000+ educational videos for CA Foundation and CA Inter students
- Known for his dynamic, conceptual and “fun-and-learn” teaching style
- Guided thousands of students across India to success in CA exams
- Strong academic background with B.Com (BMCC, Pune) and ACA qualification
- Widely appreciated for his clarity, energy, and practical approach to law subjects
- Through Shikshadwar, offers comprehensive classes, books, tests, and mentorship to CA students

CAADARSHJOSHI

CA DARSHAN JAIN

CA , CS , LLB , DISA , DIRM , B.COM

CO FOUNDER

- Chartered Accountant by profession & educator by passion
- Teaching Financial Accounting , Financial Management & Strategic Management to CA Students For 12 Years.
- Practicing Chartered Accountant For Past 13 years in The Field of Audit , Direct & Indirect Taxes & Management Consultancy
- Elected as Convenor of The Jalna CA CPE Chapter of WIRC of ICAI For 2 consecutive years 20-21 & 21-22.
- He Has Successfully Completed & Qualified Following Certificate Course Conducted By ICAI

1. Forensic Accounting & Fraud Detection
2. Concurrent Audit of Banks
3. Goods & Service Tax (GST)
4. Public Finance & Accounting
5. Drafting & Pleading Before Authorities
6. Wealth management & Financial Planning
7. Artificial Intelligence

@CA_DARSHAN_JAIN

CA TUSHAR TAPARIA

CA , LLB

- A multi-faceted professional with a Chartered Accountancy qualification and a Bachelor’s degree in Law.
- Brings 7+ years of teaching experience across CA and CS professional courses.
- Specializes in:
- Taxation at CA Intermediate and CS Executive levels
- Economics at CA Foundation level
- Known for simplifying complex concepts with crystal-clear explanations and practical insights.
- Expert in delivering Fasttrack batches with proven accelerated learning techniques.
- Frequently invited as a visiting faculty for Taxation at reputed coaching institutes.
- Loved by students for his interactive teaching style, real-life examples, and exam-oriented approach.

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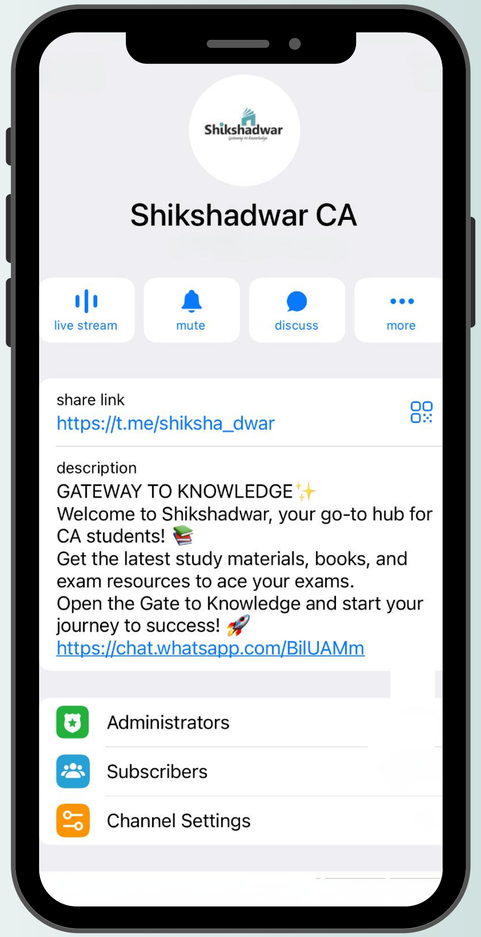

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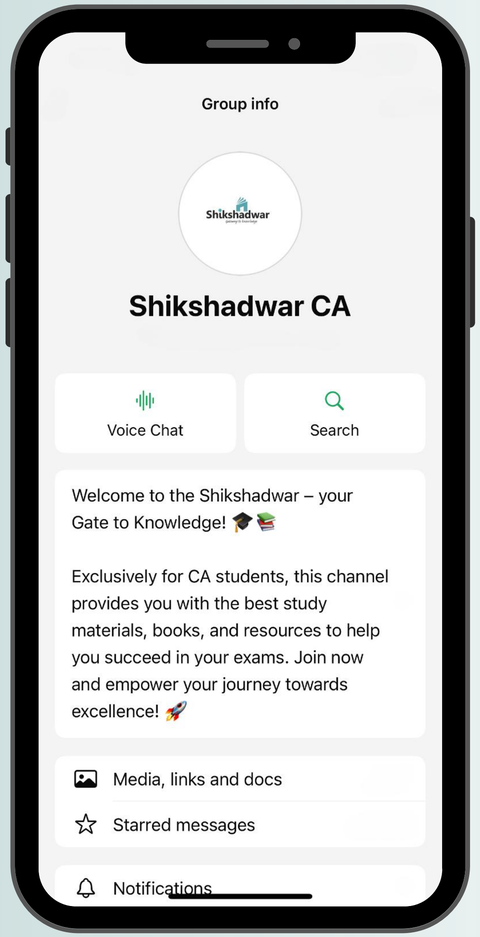

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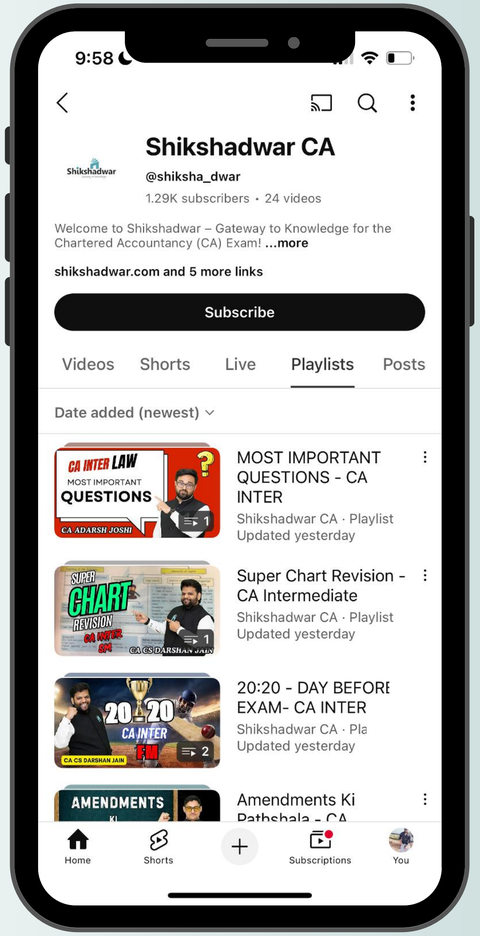

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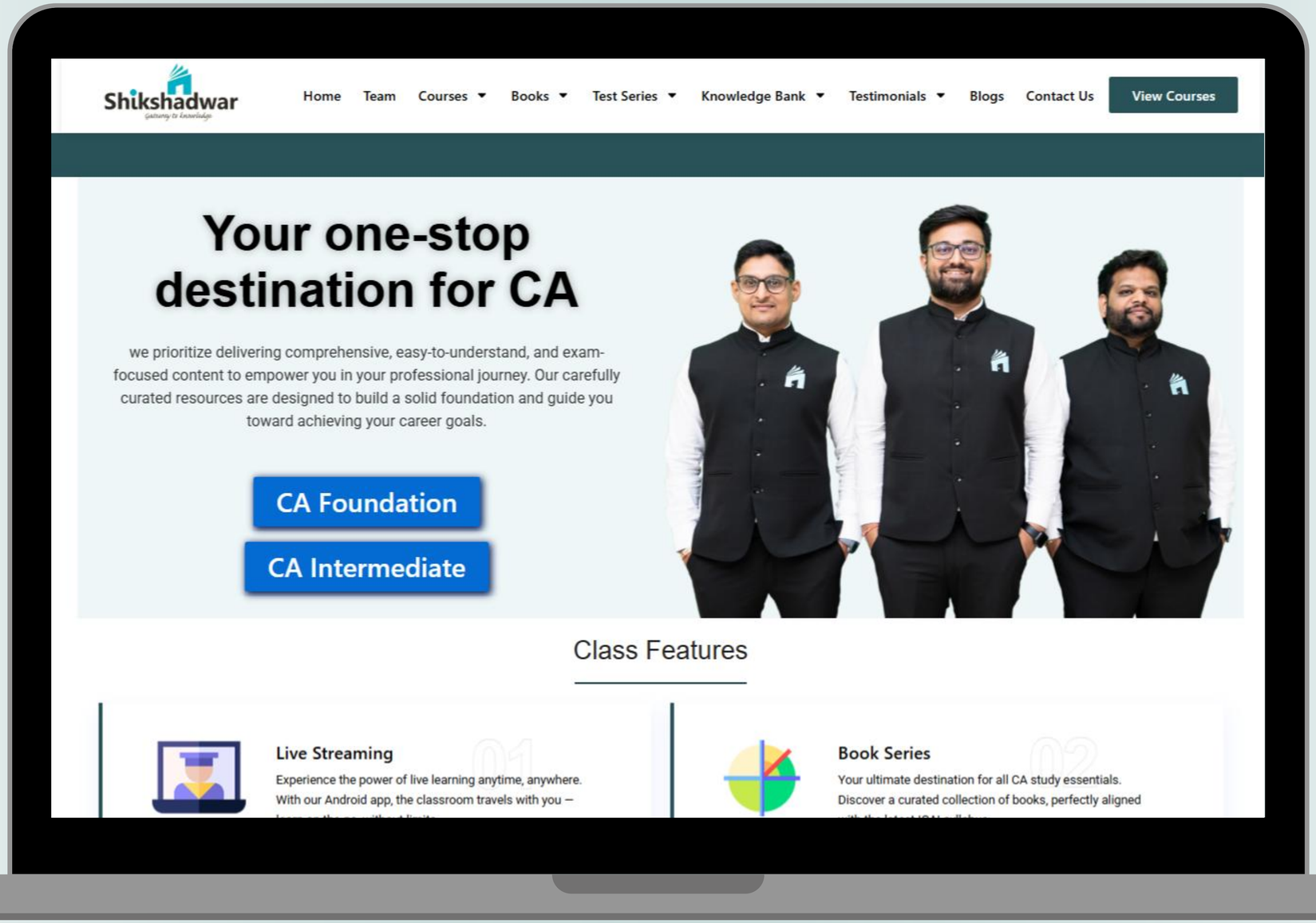

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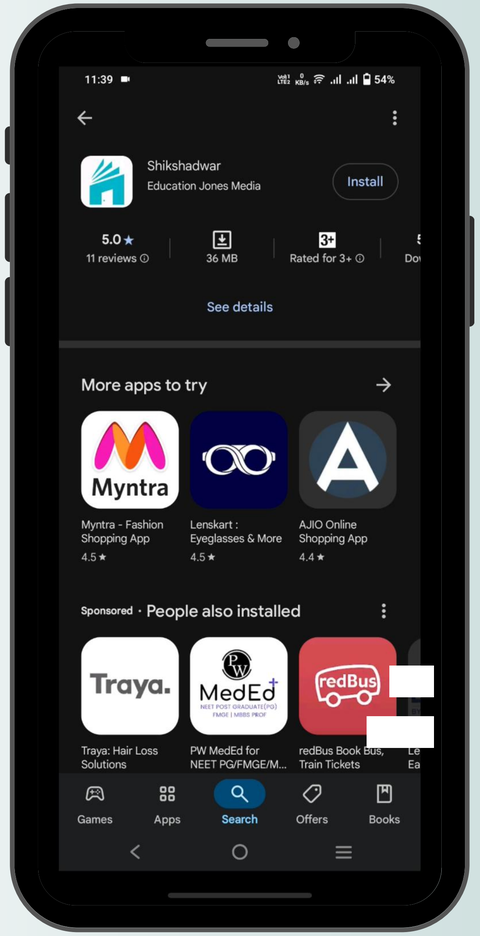

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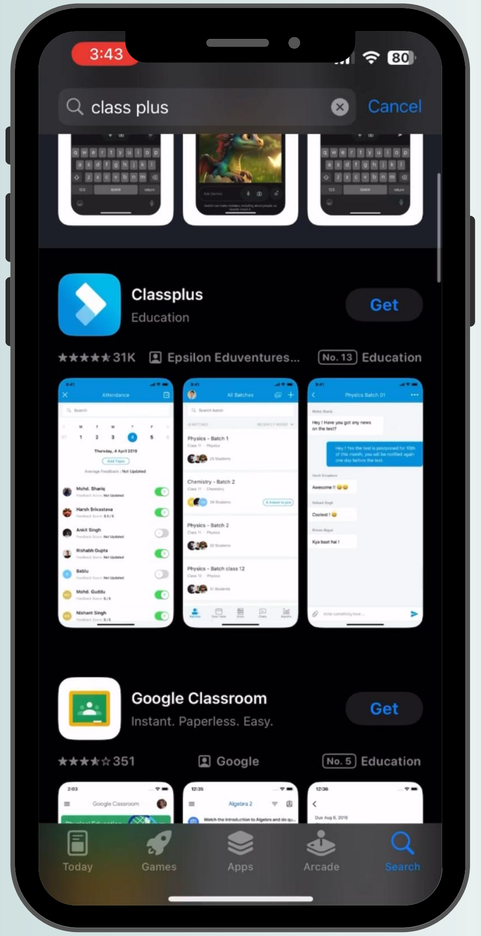

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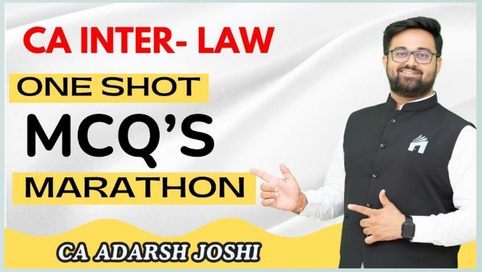
CA INTERMEDIATE MAY 25

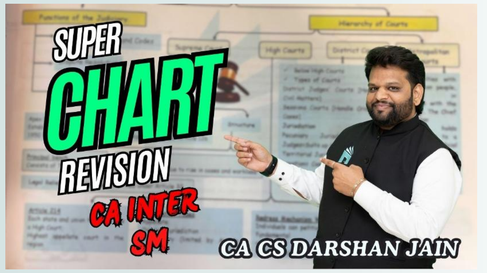
Marathons Live Streams

RRR - Result Oriented Rapid Revision

Most Imp Questions



One Shot MCQ's Marathon



Super Chart Revision

Amendments Ki Pathshala

20 -20 Series

CA INTERMEDIATE MAY 25

Marathons Schedule With Links

DATE	TIME	EDUCATOR	SUBJECT	TOPICS	YOUTUBE LINK
17/4/2025	8.00 AM	CA ADARSH JOSHI	LAW	RRR	WATCH NOW
18/4/2025	12.00 NOON	CA TUSHAR TAPARIA	GST	RRR	WATCH NOW
19/4/2025	8.00 AM	CA CS DARSHAN JAIN	FM	RRR	WATCH NOW
20/4/2025	8.00 AM	CA ADARSH JOSHI	LAW	ONE SHOT MCQ MARATHON	WATCH NOW
21/4/2025	2.00 PM	CA TUSHAR TAPARIA	GST	GST AMENDMENTS & ITS IMPORTANT QUESTIONS	WATCH NOW
23/4/2025	8.00 AM	CA CS DARSHAN JAIN	FM	ONE SHOT MCQ MARATHON	WATCH NOW

DATE	TIME	EDUCATOR	SUBJECT	TOPICS	YOUTUBE LINK
24/4/2025	2.00 PM	CA TUSHAR TAPARIA	DT	DT AMENDMENTS & ITS IMPORTANT QUESTIONS	
27/4/2025	8.00 AM	CA CS DARSHAN JAIN	SM	ONE SHOT MCQ MARATHON	
4/5/2025	8.00 AM	CA ADARSH JOSHI	LAW	MOST IMPORTANT QUESTIONS	
6/5/2025	3.00 PM	CA TUSHAR TAPARIA	TAXATION	20-20	
12/5/2025	8.00 AM	CA CS DARSHAN JAIN	FM	20-20	
13/5/2025	8.00 AM	CA CS DARSHAN JAIN	SM	SUPER CHART REVISION	

COST OF CAPITAL

WEIGHTAGE ANALYSIS

SR.NO	NAME OF TOPIC	May 18	Nov 18	May 19	Nov 19	Nov 20	Jan 21	Jul 21	Dec 21	May 22	Nov 22	May 23	Nov 23
1	MEANING , SCOPE AND OBJECTIVES OF FM	4	2		3	4	4	2	2	2	2		4
2	TYPES OF FINANCING	6	8	6	4	4	2	4	4	2	4	6	8
3	LEVERAGE ANALYSIS	5	10	10	10	12	10	10	10	10	10	7	5
4	COST OF CAPITAL		10	5	14	5	10	10	5	10	11	10	10
5	CAPITAL STRUCTURE	10	5	10		10	10	5	10	10	6	10	10
6	CAPITAL BUDGETING	28	10	15	20	5	12	12	2	14	20	10	10
7	RISK ANALYSIS IN CAPITAL BUDGETING	4	7	6	3	12	5	5	14	5	5	5	5

SR.NO	NAME OF TOPIC	May 18	Nov 18	May 19	Nov 19	Nov 20	Jan 21	Jul 21	Dec 21	May 22	Nov 22	May 23	Nov 23
8	ESTIMATION & FINANCING OF WORKING CAPITAL	10		10		10	5			5		4	5
9	MANAGEMENT OF ACCOUNT RECIEVABLES		10					9	5			5	
10	MANAGEMENT OF CASH & MARKETABLE SECURITIES				10		4		5		9		
11	MANAGAMENT OF PAYABLES												
12	MANAGEMENT OF INVENTORY									5			
13	DIVIDEND DECISION		5	5	5	5	5	5	5	4		5	10
14	RATIO ANALYSIS	5	5	5	5	5	5	10	10	5	5	10	5
	TOTAL	72	72	72	74	72	72	72	72	72	72	72	72

BIRDS EYE VIEW

- Introduction.
- Cost of Debt – Irredeemable Debt , Redeemable Debt (Approximation Method & YTM Approach) , Cost of Convertible Debentures
- Cost of Preference Shares - Irredeemable & Redeemable (Approximation Method & YTM Approach)
- Cost of Equity- Dividend Price Model, Earning Price Model ,growth Approach, Realized Yield Approach, CAPM.
- Cost of Retained Earnings
- Weighted Average Cost of Capital- Book Value & Market Value Approach
- Marginal Cost of Capital
- Important Points
- Problems

INTRODUCTION

In simple terms Cost of capital is

1. Expectation of investors from the company. As the risk perceived by the investors increases return expected by them also increases. Resulting in increase in cost of capital

2. Cost of capital refers to the discount rate that is used in determining the present value of the estimated future cash proceeds of the business/new project and eventually deciding whether the business/new project is worth undertaking or not.

3. It is also the minimum rate of return that a firm must earn on is investment which will maintain the market value of share at its current level.

4. It can also be stated as the opportunity cost of an investment, i.e. the rate of return that a company would otherwise be able to earn at the same risk level as the investment that has been selected.

COST OF DEBT (Kd)

Debt includes bank loan, debentures (redeemable or irredeemable), Bonds Etc. debt has least cost of capital since interest is tax deductible and debt is generally secured.

Cost of Debt (Kd)

Irredeemable Debt

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

Redeemable Debt

Approximation method

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

YTM Approach

1. Value of shares in future.

Convertible Debenture

Approximation method

YTM

1. Identify cash flows
2. Calculate PV at 2 different rates

COST OF IRREDEEMABLE DEBT

Formula

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

Terms used

K_d = Cost of Debt

I = Amount of interest

T = Tax rate (not tax amount)

NP = Net proceeds

NP = Face value – Discount on issue + Premium on issue – Flotation issue cost exp.

Important points

- K_d may be calculated either for one debenture or for all debentures
- Interest is calculated on face value of Debt.
- Interest is multiplied by (I-t) because it is tax deductible
- If period of debt is not given assume as irredeemable debt.
- Flotation cost includes expenses of issue like advertisement, printing prospectus etc.

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?

Cost of irredeemable debenture:

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

$$K_d = \frac{₹\ 12}{₹\ 94}(1-0.35) = 0.08297 \text{ or } 8.30\%$$

COST OF REDEEMABLE DEBT (APPROXIMATION METHOD)

Formula

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

Terms used

K_d = Cost of Debt , I = Amount of interest , T = Tax Rate , RV = Redemption value , RV = Face value + Premium on redemption
NP = Net proceeds , NP = Face value - Discount on issue + Premium on issue – Flotation cost , N = term/period of debt

Important points

- Numerator is annual cost of debt and denominator is average investment
- If nothing is given regarding RV assume redemption is done at par
- Premium on issue is gain but premium on redemption is expenditure
- Premium on redemption is expressed as certain % face value
- $(\frac{RV-NP}{N})$ is also tax deductible. However tax shield is not considered on it
- If Flotation cost is given in Rupees then k_d is calculated for all debentures put together.
- Flotation cost includes expenses of issue like advertisement, printing of prospectus etc.
- If period of debt is not given assume as irredeemable debt
- In This Method , Higher The Difference Between RV & NP , Lower the Accuracy of Answer
- This Formula is Not Suitable in case gradual Redemption of Bonds & Debentures

ILLUSTRATION 2

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.

The cost of debenture (K_d) will be calculated as below:

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

$$K_d = \frac{₹\,10(1-0.35)+\frac{(₹\,100-₹\,110)}{5\text{years}}}{\frac{(₹\,100+₹\,110)}{2}}$$

$$\text{Or, } K_d = \frac{₹10\times0.65-₹2}{₹105} = \frac{₹\,4.5}{₹\,105} = 0.0428 \text{ or } 4.28\%$$

ILLUSTRATION 3

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.

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

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

$$\text{Or, } K_d = \frac{₹10\times0.65+₹4}{₹90} = \frac{₹10.5}{₹90} = 0.1166 \text{ or } 11.67\%$$

COST OF REDEEMABLE DEBT (YIELD TO MATURITY APPROACH)

The Cost of Redeemable Debt (Kd) is Also Calculated By Discounting the Relevant Cash Flows using Internal Rate Of Return (IRR) . Here , YTM is the Annual Return of an Investment from the Current date Till Maturity Date. So , YTM is the Internal Rate of Return at which current price of a debt equals to the present value of all cash Flows.

The relevant cash flows are as follows:

Year	Cash flows
0	Net proceeds in case of new issue/ Current market price in case of existing debt (NP or P_0)
1 to n	Interest net of tax [I(1-t)]
n	Redemption value (RV)

Steps to calculate relevant cash flows:

Step-1: Identify the cash flows.

Step-2: Calculate NPVs of cash flows as identified above using two discount rates (guessing).

Step-3: Calculate IRR.

$$\textbf{IRR} = \textbf{Start Rate} + \frac{\textit{Surplus at Start Rate}}{\textit{Surplus at Start rate} - \textit{Deficit at End Rate}} (\textit{Difference Between Rates})$$

Important points

- YTM Or Present Value method is a Superior method of Determining Cost of Debt of Company to Approximation method and it is also Preferred in The Field of Finance.
- In This Method , Higher The Difference Between Start rate & End Rate , Lower the Accuracy of Answer

ILLUSTRATION 4

A company issued 10,000, 10% debentures of ₹ 100 each on 1.4.2013 to be matured on 1.4.2018. The company wants to know the current cost of its existing debt if the market price of the debentures is ₹ 80, assuming 35% tax rate.

Statement Showing NPV at 10% & 15%

Year	Cash Flow	PVF @ 10%	DCF	PVF @ 15%	DCF
0	(80)	1.00	(80)	1.00	(80)
1-5	6.5	3.791	24.64	3.352	21.79
5	100	.621	62.10	.497	49.7
			6.74		(8.51)

Kd By Interpolation formula – 12.21%

ILLUSTRATION 5

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.

FV = 100000 Issue Price = 2500

N = 25 years

$FV = PV(1+r)^n$

$100000 = 2500(1+r)^{25}$

$40 = (1+r)^{25}$

$\therefore r = 16\%$ approx

$\therefore K_d = 16\%$

Future value interest factor of ₹1 per period at i% for n periods, FVIF(i,n).

(The Compound Sum of One Rupee)

Period	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
16	5.311	6.130	7.067	8.137	9.358	10.748	12.330	14.129	16.172	18.488
17	5.895	6.866	7.986	9.276	10.761	12.468	14.426	16.672	19.244	22.186
18	6.544	7.690	9.024	10.575	12.375	14.463	16.879	19.673	22.901	26.623
19	7.263	8.613	10.197	12.056	14.232	16.777	19.748	23.214	27.252	31.948
20	8.062	9.646	11.523	13.743	16.367	19.461	23.106	27.393	32.429	38.338
25	13.585	17.000	21.231	26.462	32.919	40.874	50.658	62.669	77.388	95.396
30	22.892	29.960	39.116	50.950	66.212	85.850	111.065	143.371	184.675	237.376
35	38.575	52.800	72.069	98.100	133.176	180.314	243.503	327.997	440.701	590.668
40	65.001	93.051	132.782	188.884	267.864	378.721	533.869	750.378	1,051.668	1,469.772
50	184.565	289.002	450.736	700.233	1,083.657	1,670.704	2,566.215	3,927.357	5,988.914	9,100.438

ILLUSTRATION 6

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?

Statement Showing Present Value of Future Cash Flows

Year	Amount of Interest	Redemption of principle	Total Cash Flow	PV @ 6%	PV of Cash Flow
1	400	1000	1400	0.9434	1320.76
	(5000*8%)				
2	320	1000	1320	0.8900	1174.80
	(4000*8%)				
3	240	1000	1240	0.8396	1041.10
	(3000*8%)				
4	160	1000	1160	0.7921	918.84
	(2000*8%)				
5	80	1000	1080	.7473	807.08
	(1000*8%)				
				Total	5262.08

COST OF CONVERTIBLE DEBENTURES

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

ILLUSTRATION 7

A company issued 10,000, 15% Convertible debentures of ₹ 100 each with a maturity period of 5 years. At maturity, the debenture holders will have an option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is ₹ 12 each and historically the growth rate of the shares is 5% per annum. Compute the cost of debentures assuming 35% tax rate.

Determination of Redemption value.

RV shall be higher of

A] Cash = 100

B] Shares = 10 shares × 12(1+0.05)^5

= 10 shares × 15.32

= 153.20

∴ Redemption value in shares is higher, Debentureholders shall prefer redemption in shares

Approximation method

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

$$= \frac{15(1-0.35) + \frac{153.20 - 100}{5}}{\frac{153.20 + 100}{2}} \times 100$$

$$= 16.11\%$$

YTM Approach

Year	Cash flow	PVf@ 10%	DCF	PVf@ 20%	DCF
0	(100)	1.00	(100)	1.00	(100)
1-5	9.75	3.791	36.96	2.991	29.16
5	153.20	0.621	95.14	0.402	61.59
			32.1		(9.25)

$$IRR = K_d = 10 + \frac{32.10}{32.10 - (9.25)} \times 10$$

$$= 10 + \frac{32.10}{41.35} \times 10$$

$$= 17.76\%$$

COST OF PREFERENCE SHARES (Kp)

The cost of preference share capital is the dividend expected by its holders. Though payment of dividend is not mandatory, non-payment may result in exercise of voting rights by them.

The payment of preference dividend is not adjusted for taxes as they are paid after taxes and is not deductible.

Cost of Preference Shares

Irredeemable

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

Redeemable

Approximation Method

$$K_P = \frac{PD + \frac{RV - NP}{N}}{\frac{RV + NP}{2}} \times 100$$

YTM Approach

1] Identify C_1

2] 2 NPV

3] Interpolation

COST OF IRREDEEMABLE PREFERENCE SHARES

Formula

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

Terms used-

PD = Amount of preference dividend

NP = Net proceeds of issue

NP = Face value – Discount on issue + Premium on issue – Flotation cost

K_p = Cost of preference shares

Important points

- Preference dividend is not tax deductible.

- Cost of preference shares is generally more than cost of debt because preference shareholders take more risk.

ILLUSTRATION 8

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?

Here, Net Proceeds (P_o) will be issue price less floatation cost.

P_o = ₹ 100 - 3% of ₹ 100 = ₹ 97

$$K_p = \frac{PD}{P_o}$$

$$= \frac{₹\ 12}{₹\ 97} = 0.1237 \text{ or } 12.37\%$$

COST OF REDEEMABLE PREFERENCE SHARES

Formula

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

Terms used

PD = Amount of preference dividend , RV = Redemption value , NP = Net proceeds , NP = Face value – discount on issue + premium on issue – flotation cost , K_p = Cost of preference shares , N = Period/ no of years

Important points

- Numerator is annual cost of preference shares and denominator is average investment
- If nothing is given regarding RV assume redemption is done at par.
- Premium on issue is gain but premium on redemption is expenditure
- Premium on redemption is expressed as certain % of face value
- PD is not tax deductible hence we have not multiplied by (1-t)
- K_p may be calculated for one preference share or all preference shares put together

ILLUSTRATION 9

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?

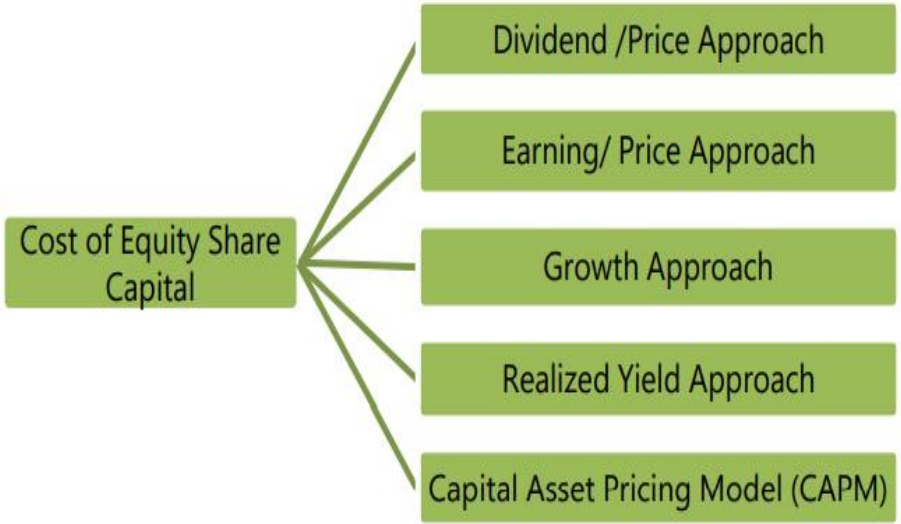
$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_p = \frac{10 + \left(\frac{100 - 95}{10}\right)}{\left(\frac{100 + 95}{2}\right)} = 0.1077 \text{ or } 10.77\% \text{ (approx.)}$$

COST OF EQUITY SHARES (Ke)

It may prima facie appear that equity capital does not carry any cost. But this is not true. The market price of share is a function of return that equity shareholders expect and get. If the company does not meet their requirements, it will have an adverse effect on the market price of Share. Also it has relatively the highest cost of capital Since expectations of equity holders are high.

In simple words, cost of equity capital is the rate of return which equates the present value of expected dividends with the market price of Share.



Cost of Equity

DP model

$\frac{DPS}{P_0} \times 100$

EP model

$\frac{EPS}{P_0} \times 100$

DP growth

$\frac{D_1}{P_0} + g \times 100$

g = given

FV & PV = $D_0(1+r)^n$

$g = b \times r$

Realised Yield

Earning per year of Dividend & Increase % in MP

Amt invested

CAPM

$R_f + \beta(R_m - R_f)$

COST OF EQUITY SHARES - DIVIDEND/PRICE APPROACH

Here Cost of equity capital is computed by dividing the current dividend by average market price per share. However, this method cannot be used to calculated cost of equity of units suffering losses.

This dividend price ratio expresses the cost of equity capital in relation to what yield the company should pay to attract investors. It is used to estimate the cost of companies having no-growth or zero-growth

Formula

$$K_e = \frac{D}{Po}$$

Terms Used

P_o = current market price of equity share , D = amount of dividend , K_e = cost of equity

Important points

- This formula assumes constant dividend in future
- This formula is derived from the formula of present value of perpetuity
- P_o is present value of future dividends discounted at cost of equity
- If flotation cost is given then it is reduced from p_o to arrive at net proceeds from share

COST OF EQUITY SHARES - EARNING/PRICE APPROACH

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

Formula

$$K_e = \frac{EPS}{Po}$$

Terms Used

P_o = current market price of equity share , EPS = Earning Per Share ,, K_e = cost of equity

Important points

- This formula assumes constant EPS in future

COST OF EQUITY SHARES - GROWTH APPROACH

The Growth Approach is based on Growth in Dividend and Earning over the Period of time

DIVIDEND GROWTH

Formula

$$K_e = \frac{D_1}{Po} + G \quad , \quad P_o = \frac{D_1}{Ke - G}$$

Terms used

D_1 = expected dividend for next year , K_e = cost of equity , P_o = current market price of equity share . G = Growth in rate of Dividend

Important points

- Please read carefully whether question gives dividend or expected dividend
- Growth rate in dividend is assumed to be constant and hence this formula is derived from formula of growing perpetuity
- Sometimes growth rate is required to be calculated using FV formula

DETERMINATION OF GROWTH RATE

Growth rate can also be found as follows:

Step-I: Divide D_0 by D_n, find out the result, then refer the FVIF table.

Step-II: Find out the result found at Step-I in corresponding year's row.

Step-III: See the interest rate for the corresponding column. This is the growth rate.

Where,

D_0 = Current dividend,

D_n = Dividend in n years ago

EXAMPLE

The current dividend (D_0) is ₹ 16.10 and the dividend 5 year ago was ₹10.

Find Growth Rate

$$= \frac{D_0}{D_n}$$

$$= \frac{16.10}{10} = 1.61$$

1.61 is FVIF @ 10% for 5 years

Hence growth rate shall be 10%.

Future value interest factor of ₹1 per period at i% for n periods, FVIF(i,n).

(The Compound Sum of One Rupee)

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594

DTERMINATION OF GROWTH RATE - GORDONS GROWTH MODEL

Formula

$$g = b \times r$$

Terms used

g = Growth Rate , b = Earning Retention ratio/Rate , r = Rate of return

Important points

- This Formula determines growth rate.
- The Said Approach Shall be Dealt In Detailed Manner in Topic of Dividend Decisions

COST OF EQUITY SHARES - REALIZED YIELD APPROACH

According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future. It computes cost of equity based on the past records of dividends actually realised by the equity shareholders. Though, this approach provides a single mechanism of calculating cost of equity, it has unrealistic assumptions like risks faced by the company remain same; the shareholders continue to expect the same rate of return; and the reinvestment opportunity cost (rate) of the shareholders is same as the realised yield. If the earnings do not remain stable, this method is not practical.

$$Ke = \frac{\text{Dividend Per year + Increase in Market price of share}}{\text{Amount Invested}} \times 100$$

ILLUSTRATION 10

Mr. Mehra had purchased a share of Alpha Limited for ₹ 1,000. He received 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.

$$K_e = \frac{\text{Earning Per Year}}{\text{Amount Invested}}$$

$$= \frac{(\text{Dividend in 5 yrs} + \text{Increase in market price in 5 yrs}) \mid 5 \text{ yrs}}{\text{Amount Invested}} \times 100$$

$$= \frac{(500 + 128) \mid 5}{1000} \times 100$$

$$= \frac{125.60 \times 100}{1000}$$

$$= 12.56\%$$

ILLUSTRATION 11

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*

$$\text{Year 1} = \frac{1+9.75}{9} = \frac{10.75}{9} = 1.1944$$

$$\text{Year 2} = \frac{1+11.50}{9.75} = \frac{12.50}{9.75} = 1.2821$$

$$\text{Year 3} = \frac{1.20+11}{11.50} = \frac{12.20}{11.50} = 1.0609$$

Year 4 = $\frac{1.25 + 10.60}{11.00} = \frac{11.85}{11.00} = 1.0773$

Geometric mean

$= (1.1944 \times 1.2821 \times 1.0609 \times 1.0773)^{1/n} - 1$

$= (1.75)^{1/4} - 1$

$= 1.15 - 1$

$= 0.15$

that is Ke = 15%.

1. $\sqrt{12}$ times
2. -1
3. $\frac{1}{2} \times (4)$
4. $+1$
5. $x = 12$ times

COST OF EQUITY SHARES - CAPM MODEL

Formula

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

Terms used

R_f = risk free rate , β =beta of company
R_m = market rate of return , K_e = cost equity

Important points

- Higher the beta higher the risk and higher the return
- $R_m - R_f$ is known as market risk premium
- β measures the non diversifiable risk present in the company

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%.

$$K_e = R_f + ß\,(R_m - R_f)$$

$$K_e = 0.10 + 1.75\,(0.15 - 0.10)$$

$$= 0.10 + 1.75\,(0.05) = 0.1875 \text{ or } 18.75\%$$

COST OF RETAINED EARNINGS

Formula

- If personal taxation rate is not given K_r is same as K_e
- If personal taxation rate is given: $K_r = K_e \ (1-t_p) \ (1-f)$

Terms used

K_r = cost of retained earnings , K_e = cost of equity , T_p = personal taxation rate of shareholders , f – Floatation Cost

Important points

- Retained earnings belong to shareholders and hence they have cost
- Retained earnings do not have any flotation cost
- Normally Ke remains higher than Kr , Due to Issue of Shares at a Price Lower than CMP and Floatation Cost.

Cost of Retained Earnings

K_r

If floatation cost is in Rs. then calculate K_r using K_e formulae

No floatation cost & NO Personal Taxation

$K_r = K_e$

If only Personal Taxation

$K_r = K_e(1-t_P)$

If only floatation cost

$K_r = K_e(1-f)$

If Personal Taxation & floatation cost

$K_r = K_e(1-t_P)(1-f)$

ILLUSTRATION 13

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%.

$$K_r = \frac{D_1}{P_0} + g = \frac{10}{200} + 0.05 = 10\%$$

$$K_e = \frac{D_1}{P_0} + g = \frac{10}{190\text{-}5} + 0.05 = 10.41\%$$

ILLUSTRATION 14

Cost of equity of a company is 20%. Rate of floatation cost is 5%. Rate of personal income tax is 30%. Calculate cost of retained earnings.

$$K_r = K_e (1 - t_p)(1 - f)$$

$$= 0.20 (1 - 0.30)(1 - 0.05)$$

$$= 13.30\%$$

WEIGHTED AVERAGE COST OF CAPITAL (Ko)

WACC denotes the Weighted average cost of capital. It is defined as the Overall cost of capital computed by reference to the proportion of each component of capital as weights. It is denoted by Ko. WACC can be calculated either on market value basis or book value basis.

Statement Showing Computation of WACC

SR. NO	SOURCE	BV OR MV	PROPORTION	COST	WACC
1	2	3	4	5	6 =5*4
A	EQUITY SHARE CAPITAL	XXX	XXX	Ke	XXX
B	RETAINED EARNINGS	XXX	XXX	Kr	XXX
C	PREFRENCE SHARE CAPITAL	XXX	XXX	Kp	XXX
D	LONG TERM DEBT	XXX	XXX	Kd	XXX
		XXXX	1		XXXX

MARGINAL COST OF CAPITAL

- **The marginal cost of capital may be defined as the of raising an additional rupee of capital.**
- **Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.**
- **The marginal weights represent the proportion of funds the firm intends to employ. thus, the problem of choosing between the book value weights and the market value weights does not arise in the case of marginal cost of capital compilation.**
- **To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component costs. The marginal cost of capital should, therefore, be calculated in the composite sense. When a firm raises funds in proportion manner and the component's cost and the marginal cost of capital. The component costs may remain constant up to certain level of funds raised and then start increasing with amount of funds raised.**
- **For example, the cost of debt may remain 7% (after tax) till Rs 10 lakhs of debt is raised, between Rs 10 lakh Rs 15 lakhs, the cost may be 8% and so on. Similarly, if the firm has to use the external equity When the Retained profits are not Sufficient , The Cost of Equity will be higher Because of The Flotation costs.When the components cost start rising, the average cost of capital will rise and the marginal cost of capital will however, rise at faster rate.**

IMPORTANT POINTS

- Cost of capital is expressed in percentage terms instead of Rs. For enabling comparison between two firms or two periods.
- Cost of capital is calculated on annual basis.
- Cost of capital is calculated after considering tax shield/tax savings.
- Cost of capital is calculated for long term funds only.
- For comparing the cost of capital of two capital structures the amount raised must be same. Otherwise comparison won't be meaningful.
- Interest is paid on face value of debentures and not the issue price.
- Redemption of debentures may be done at face value or at premium. If nothing is specified it is to be assumed at par.
- Premium on issue of debentures is capital profit and hence it is deducted from the costs. Premium on redemption of debentures is cost and hence it is added.
- Premium on redemption is certain % of face value.

IMPORTANT POINTS

- Cost of preference shares is more than cost of debt but less than cost of equity.
- Current market price of share is future value of dividends as per D/P model
- Dividend declared is certain percentage of face value of equity shares.
- If share price is given as cum dividend inclusive on dividend then amount of dividend is to be deducted from such price to arrive at p_o
- We first calculate the specific cost of capital for each source of finance and then we calculate the weighted average cost of capital (WACC) for all sources put together. WACC is also known as hurdle rate or discount rate or overall cost of capital and it is used while making investment decisions.
- WACC may be calculated using either book values or market values. While calculating WACC on market value basis market value of retained earnings is not written separately, it is included in the market value of share capital only.
- In case Ke & Kr differs then to give market value weights. Market value of Equity Shares should be apportioned in the ratio of book value of paid up equity capital and book value of retained earnings.

IMPORTANT POINTS

- If market value of any source is not given then face value is assumed as market value for calculation of WACC on market value basis.
- Specific cost does remain same whether WACC is calculated using book value approach or market value approach.
- If company has only equity shares then cost of equity itself becomes WACC. Company with only Debt is not possible.
- If no approach is specified in the problem for calculation of WACC then calculate the WACC using book value approach and write note to that effect.
- There is no market value for term loan. Hence while calculating WACC on market value basis face value itself will be written as market value.
- Marginal cost of capital may be defined as “the cost of raising an additional rupee of capital”.
- Whenever Cost & Market price Both are Given take Market Price.

ILLUSTRATION 15

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.

Book value of Equity = 50 000 shares x 10

= 500000

Book value of retained Earnings = 150000 (given)

∴ Ratio of equity with respect to Retained Earnings = 1:3

Market value of Equity

5000 × 50

= 2500000

Statement Showing WACC using Market Value Weights

SR.NO	SOURCE	MV	PROPORTION	COST	WACC
A	Equity Shares	625000	0.25	10.41%	0.0260
B	Retained Earnings	1875000	0.75	10%	0.075
		2500000	1.00		0.101

∴ WACC = K_0 = 10.10%

ILLUSTRATION 16

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 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.

Computation of ke

$$K_e = \frac{D_1}{P_0 - f} + G \times 100$$

$$= \frac{1}{24 - 4} + 0.05 \times 100$$

$$= 10\%$$

Computation of kp

Net Issue Price = 110 - 2% = 107.80

Dividend Per year = 5 Per share

YEAR	CASH FLOW	PVF AT 5%	DCF	PVF AT 3%	DCF
0	(107.80)				
10	5				
10	100				
		(7.79)		9.25	

$$K_p = 3 + \frac{9.25}{17.04} \times 2$$

$$= 4.09\%$$

Computation of kd

Net Issue Price = 105 − 4% = 100·80

Interest Net of Taxes = 10 − 30% = 7

YEAR	CASH FLOW	PVF AT 10%	DCF	PVF AT 5%	DCF
0	(100·80)				
1-10	7				
10	100				
		(19·185)		14·65	

$$Kd = \text{Start rate} + \frac{\text{Surplus at start rate}}{\text{Surplus at start rate} - \text{Deficit at end rate}} \times \text{Deff}$$

$$= 5 + \frac{14.65}{14.65 + 19.185} \times 5$$

$$= 5 + \frac{14.65}{33.835} \times 5 = 7.16\%$$

Statement Showing WACC using Book Value Weights

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity shares	1000000	0.50	10%	0.05
B	pref. shares	500000	0.25	4.09%	0.0102
C	Debt	500000	0.25	7.16%	0.0179
		2000000	1.00		0.0781

$\therefore$ WACC = K_0 = 7.81%

Statement Showing WACC using Market Value Weights

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity shares	2400000	0.691	10%.	0.0691
B	Pref Shares	(100000 x 24) 550000	0.158	4.69%.	0.0065
C	Debt	(5000 x 110) 525000	0.151	7.16%.	0.0108
		(5000 x 105)			
		3475000	1.00.		0.0864

∴ WACC = Ko = 8.64%.

Tutorial Note

1] Whenever Cost & market price both are given use market price.

2] In the absence of information, flotation cost shall always be on Issue Price.

ILLUSTRATION 17

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:

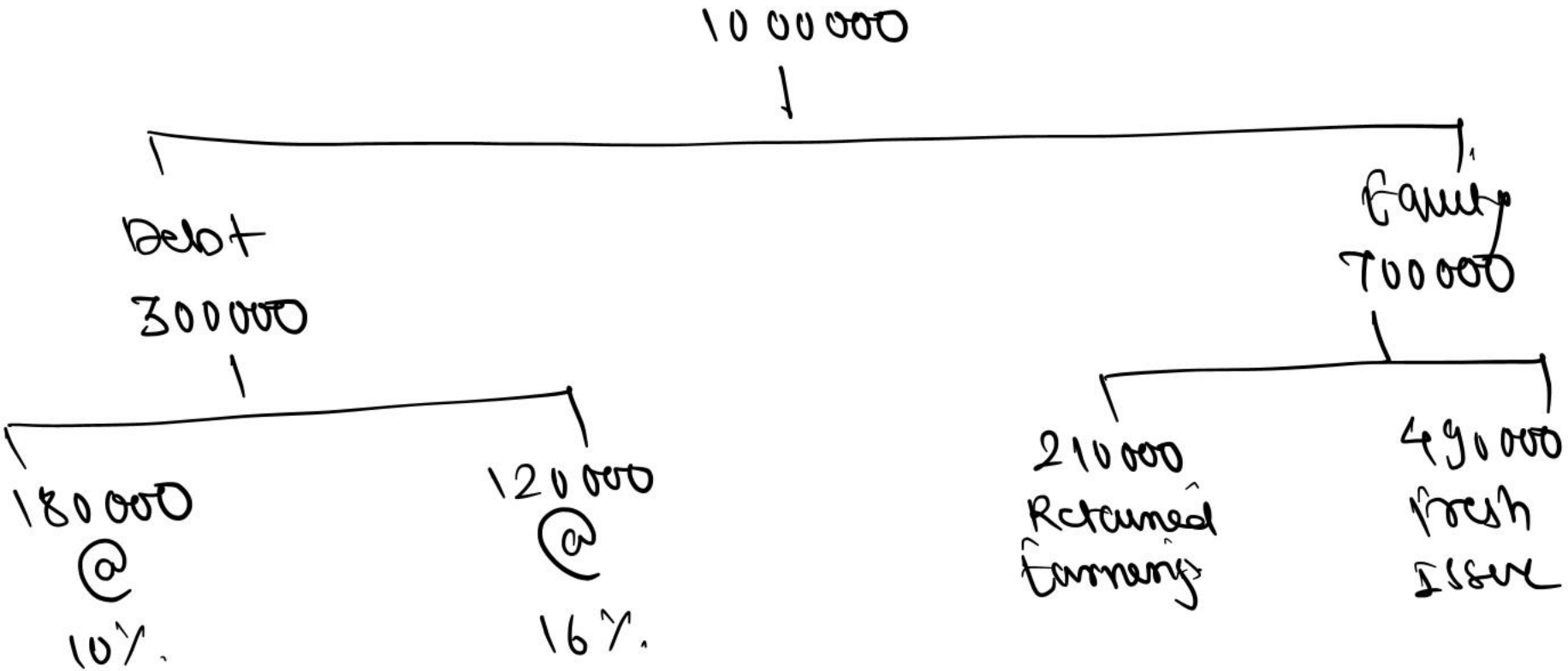
(a) DETERMINE the pattern for raising the additional finance.

(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.

Pattern of Raising Additional Finance



Computation of Post tax Average Cost of Debt

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

$$= \frac{[(180000 \times 10\%) + (120000 \times 16\%)](1-0.50)}{300000} \times 100$$

$$= \frac{(18000 + 19200)(1-0.50)}{300000} \times 100$$

$$= 18600 / 300000 \times 100 = 6.20\%$$

Computation of Cost of Equity & Cost of Retained Earnings

EPS = 4, D = 2, D_1 = 2.2, P_0 = 44

G = 10%.

$$K_e = \frac{D_1}{P_0} + G \times 100$$

$$= \frac{2.2}{44} + 0.10 \times 100$$

$$= 15\%.$$

As there is no floatation cost & Personal Taxation

$$K_r = K_e = 15\%$$

Computation of Overall Weighted Average After tax Cost of Capital

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity	700000	0.70	15%	0.105
B	Debt	300000	0.30	6.20%	0.0186
		1000000	1.00		0.1236

∴ WACC = K_0 = 12.36%

ILLUSTRATION 18

ABC Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2022.

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

The company share has a market price of ₹ 23.60. Next year dividend per share is 50% of year 2021 EPS. Following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future:

Year	EPS (₹)	Year	EPS (₹)
2012	1.00	2017	1.61
2013	1.10	2018	1.77
2014	1.21	2019	1.95
2015	1.33	2020	2.15
2016	1.46	2021	2.36

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

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

(A) CALCULATE after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

(iii) Cost of 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 2021.

(D) COMPUTE marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at ₹ 20 per share?

Computation of Cost of New Debt

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

$$= \frac{16(1-0.50)}{96} \times 100$$

$$= 8.33\%$$

Computation of Cost of New preference Shares

$$K_p = \frac{D}{P_0} \times 100$$

$$= \frac{1.1}{9.20} \times 100$$

$$= 11.96\%$$

Computation of Cost of New Equity Shares

As there is increase in EPS every year by 10%, we shall consider growth rate of 10%

$$K_e = \frac{D_1}{P_0} + G \times 100$$

$$= \frac{50\% \text{ of } 2.36}{23.60} + 0.10 \times 100$$

$$= 15\%$$

Statement Showing Marginal Cost of Capital

SR.NO	SOURCE	PROPORTION	COST	MCC
A	Equity	0.80	15%	0.12
B	Preference	0.05	11.96%	0.0060
C	Debentures	0.15	8.33%	0.0125
				0.1385

∴ MCC = 13.85%

Capital Investment before issuing New Equity Shares

Earnings available for investment = 50% of 2021 Earnings

= 50% of (10000 × 2.36)

= 50% of 23600

= 11800

Proportion of Equity in Capital Structure = 80%

Hence Capital Investment that can be done from Retained Earnings & existing Capital Structure.

$$\text{Capital Investment} = \frac{11800}{80\%}$$

$$= 14750$$

Marginal Cost of Capital If Company Spends more than 14750

$$K_e = \frac{D_1}{P_0} + G \times 100$$

$$= \frac{1.18}{20} + 0.10 \times 100$$

$$= 15.90\%$$

Statement Showing Marginal Cost of Capital

SR.NO	SOURCE	PROPORTION	COST	MCC
A	Equity	0.80	15.90%	0.1272
B	Preference shares	0.05	11.96%	0.0060
C	Debentures	0.15	8.33%	0.0125
				0.1457

∴ MCC = 14.57%

ILLUSTRATION 19

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.

Floatation cost would be calculated on face value.

Cost of Preference shares

$$K_p = \frac{D}{P_0} \times 100$$

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

$$= 14.29\%$$

Cost of Equity

$$Ke = \frac{D1}{Po \cdot f} + G \times 100$$

It is given in question that Dividend rate from 10.60 To 14.19 in 5 years Thus we shall find growth rate

$$G = \frac{D0}{Dn} = \frac{14.19}{10.60} = 1.338$$

In FVIF Table it can be seen that value of Rs. 1 shall be 1.338 in 5 years at 6%. Hence $g = 6\%$.

$$Kr = \frac{15}{125 - 5} + 0.06 \times 100$$

$$= 18.50\%$$

Cost Of Retained Earnings

$$K_r = \frac{D_1}{P_0} + G \times 100$$

$$= \frac{15}{130} + 0.06 \times 100$$

$$= 17.54\%$$

Cost of Debt

A Debenture of similar class gives 16% return to the Investor, The Company needs to issue Debentures at a discount in such a way that it becomes a return of 16% to investor.

Issue Price = 15/16% = 93.75

Net Proceeds = 93.75 - Floatation Cost
= 93.75 - 2 = 91.75

Let's find out Kd by approximation method.

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

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

$$= 10.50/95.875 \times 100$$

$$= 10.95\%$$

Statement Showing WACC using Book Value Weights

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity shares	12000000	0.6154	18.50%	0.1138
B	retained Earnings	3000000	0.1538	17.54%	0.0270
C	Preference shares	3600000	0.1846	14.29%	0.0264
D	Debentures	900000	0.0462	10.95%	0.0051
		19500000			0.1723

WACC = Ko = 17.23%

Statement Showing WACC using Market Value Weights

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity Shares	16000000	0.6553	18.50%	0.1212
B	Retained Earnings	4000000	0.1638	17.54%	0.0287
C	Preference Shares	3375000	0.1382	14.29%	0.0197
D	Debentures	1040000	0.0427	10.95%	0.0047
		24415000			0.1743

$\therefore$ WACC = K_0 = 17.43%

Tutorial Note

1] Market value of Equity is apportioned between equity & retained Earnings in Book value ratio.

Future value interest factor of ₹1 per period at i% for n periods, FVIF(i,n).

(The Compound Sum of One Rupee)

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594

ILLUSTRATION 20

Kalyanam Ltd. has an operating profit of ₹ 34,50,000 and has employed Debt which gives total Interest Charge of ₹ 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of ₹ 75 Lakhs and is expected to bring an additional profit of ₹ 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

(i) Before the new Proposal

(ii) After the new Proposal.

Statement Showing WACC Before The New Proposal

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity	16875000 (WN1)	0.6429	16%	0.1029
B	Debt	9375000 (7500000 18%)	0.3571	8%	0.0286
		26250000			0.1315

∴ WACC = K_0 = 13.15%

Statement Showing WACC After the New Proposal

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity	16875000	0.50	20.89%	0.1045
B	Debt	16875000	0.50	8%	0.04
		33750000			0.1445

WACC = Ko = 14.45%

Computation of value of Equity.

$$\text{Value of Equity} = \frac{\text{Earnings available to Equity shareholders}}{K_e}$$

$$= \frac{EBIT - Interest}{16\%}$$

$$= \frac{3450000 - 750000}{16\%}$$

$$= 2700000 / 16\% = 16875000$$

WN2. Computation of Cost of Equity after New Proposal.

Value of Equity = $\frac{EAES}{Ke}$

$16875000 = \frac{EBIT - Interest}{Ke}$

$16875000 = \frac{(3450000 + 1425000) - (750000 + 600000)}{Ke}$

$$1687500 = \frac{4875000 - 1350000}{Ke}$$

$$1687500 = \frac{3525000}{Ke}$$

$$\therefore Ke = \frac{3525000}{1687500} = 0.2089$$

that is 20.89%.

ILLUSTRATION 21 (RTP MAY 2019)

As a financial analyst of a large electronics company, you are required to DETERMINE the weighted average cost of capital of the company using (a) book value weights and (b) market value weights. The following information is available for your perusal.

The Company's present book value capital structure is:

	(₹)
Debentures (₹100 per debenture)	8,00,000
Preference shares (₹100 per share)	2,00,000
Equity shares (₹10 per share)	10,00,000
	20,00,000

All these securities are traded in the capital markets. Recent prices are:

Debentures, ₹110 per debenture, Preference shares, ₹120 per share, and Equity shares, ₹ 22 per share

Anticipated external financing opportunities are:

(i) ₹ 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, ₹ 100

(ii) ₹ 100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, ₹100.

(iii) Equity shares: ₹ 2 per share flotation 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 dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 per cent.

Computation of ke

(iii) Cost of Equity shares (K_e) $= \frac{D_1}{P_0} + G = \frac{₹\,2}{₹\,22 - ₹\,2} + 0.07 = 0.17$ or 17%

Computation of kp

$$\text{Cost of Preference Shares } (K_p) = \frac{PD + \frac{(RV - NP)}{N}}{\frac{(RV + NP)}{2}} = \frac{₹12 + \frac{(₹100 - ₹95)}{10\,\text{years}}}{\frac{(₹100 + ₹95)}{2}}$$

$$= \frac{₹12 + ₹0.5}{₹97.5} = 0.1282 \text{ or } 12.82\%$$

Computation of kd

$$\text{Cost Debt } (K_d) = \frac{\text{Interest}\,(1-t)+\dfrac{(RV-NP)}{N}}{\dfrac{(RV+NP)}{2}} = \frac{₹11(1-0.35)+\dfrac{(₹100-₹96)}{10\,\text{years}}}{\dfrac{(₹100+₹96)}{2}}$$

$$= \frac{₹7.15+₹0.4}{₹98} = 0.077 \text{ or } 7.70\%$$

Statement Showing WACC using Book Value Weights

Source of capital	Book value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures	8,00,000	0.40	7.70	3.08
Preferences shares	2,00,000	0.10	12.82	1.28
Equity shares	10,00,000	0.50	17.00	8.50
	20,00,000	1.00		12.86

Statement Showing WACC using Market Value Weights

Source of capital	Market value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures $\left(\frac{₹8,00,000}{₹100} \times ₹110\right)$	8,80,000	0.265	7.70	2.04
Preferences shares $\left(\frac{₹2,00,000}{₹100} \times ₹120\right)$	2,40,000	0.072	12.82	0.92
Equity shares $\left(\frac{₹10,00,000}{₹10} \times ₹22\right)$	22,00,000	0.663	17.00	11.27
	33,20,000	1.000		14.23

Tutorial Note

1] In the given question MP & SP both are given, we shall SP as Net Proceeds of securities shall be issued at Sale Price & not market Price.

ILLUSTRATION 22 (MTP MAY 2019 SERIES 2) 5 MARKS

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

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

14% Institutional loan

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

$$= \frac{35(1-0.50)}{250} \times 100$$

$$= 7\%$$

13% Non Convertible Debentures.

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

Net Proceeds = 250 lakhs − Discount on Issue − Cost of Issue

= 250 lakhs − (250 × 2.5%) − (250 × 2%)

= 250 − 6.25 − 5

= 238.75

$$K_d = \frac{32.50\,(1-0.50)}{238.75} \times 100$$

$$= 6.81\%$$

Conclusion :- As effective cost of capital is less for 13% Non-Convertible Debentures, It is recommended to avail 250 lakhs by way 13% Non Convertible Debentures

ILLUSTRATION 23 PYQ MAY 22 (10 MARKS)

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 year 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
$PVIF_{0.03, t}$	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

(i) Cost of Convertible Debentures

Redemption value shall be higher of

1. Redemption value in cash = 100

2. Redemption in shares = 2 x Share price per share on the day of redemption

= 2 x 65.27 (MAINI)

= 130.54

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

$$= \frac{15(1-0.40) + \left(\frac{130.54 - 95}{6}\right)}{\frac{130.54 + 95}{2}} \times 100$$

$$= \frac{9 + 5.92}{112.77} \times 100 = \frac{14.92}{112.77} \times 100 = 13.23\%$$

(ii) Cost of Preference shares.

Year	Cash flow	PVF@ 3%	DCF	PVF@ 5%	DCF
0	(103.40) (110-6%)	1.00	(103.40)	1.00	(103.40)
1-10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
			13.65		(3.39)

$$Kp = \text{Start rate} + \frac{\text{Surplus at start rate}}{\text{Surplus at start rate} - \text{Deficit at end rate}} \times \text{Diff between rate}$$

$$= 3 + \frac{13.65}{13.65 + 3.39} \times 2$$

$$= 3 + \frac{13.65}{17.04} \times 2$$

$$= 4.60\ \%$$

WN 1 - Computation of Price of share after 6 yrs.

$$K_e = \frac{D_7}{P_6} + G$$

$$0.3250 = \frac{12.76(1+0.05)^7}{P_6} + 0.05$$

(WN 2) (WN 3)

$$0.3250 = \frac{17.95}{P_6} + 0.05$$

$$0.3250 - 0.05 = \frac{17.95}{P_6}$$

$$0.275\ p_6 = 17.95$$

$$p_1 = \underline{\underline{65.27}}$$

UNIT 2 - Computation of Cost of Equity

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

$$= 0.10 + 1.25 (0.18)$$

$$= 0.10 + 0.225$$

$$= 0.3250$$

That is 32.50%.

WNB - Computation of growth rate

$$g = \frac{D_0}{D_n}$$

$$= \frac{12.76}{10}$$

$$= 1.276$$

Going through FVIF table it can be seen that 1 Rs becomes 1.276 in 5 years at 5%. Hence growth rate is 5%.

ILLUSTRATION 24 PYQ NOV 22 (5 MARKS)

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.

Cost of Preference shares.

$$K_P = \frac{D}{P_0} \times 100$$

$$= \frac{2}{16} \times 100$$

$$(18-2)$$

$$= 12.50\%$$

Cost of Debt

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

$$= \frac{12(1-30)}{120} \times 100$$

$$= 7\%$$

Statement Showing WACC Based on Market value Weights

SR.NO	SOURCE	AMOUNT	PROPORTION	COST	WACC
A	Equity	1950000 (50000 x 39)	0.6664	19%	0.1266
B	Preference shares	251000 (6000 x 16)	0.0875	12.50%	0.0109
C	Debentures	720000 (6000 x 120)	0.2461	7%	0.0172
		2926000	1.00		0.1547

Ko :- 15.47%

ILLUSTRATION 25

Amrit Corporation has the following book value capital structure:

Equity Capital (50 lakh shares of ₹ 10 each).	₹ 5,00,00000
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%	₹ 4,00,00000

The companies 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%.

(a) CALCULATE the Weighted Average Cost of Capital (WACC) using market value proportions.

(b) DETERMINE the Marginal Cost of Capital (MACC) if it needs ₹ 5,00,00000 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.

1. Computation of Cost of Equity.

Since entire earnings are not distributed as dividend, we shall calculate growth rate using Gordon's model.

$$g = B \times r$$

$$= 0.40 \times 0.10$$

$$= 0.04$$

that is 4%.

$$Ke = \frac{D1}{P0} + g \times 100$$

$$= \frac{3.12}{20.80} + 0.04 \times 100$$

$$= 0.19 \times 100$$

$$= 19\%$$

2

2. Computation of Kp

$$K_p = l'D + \frac{RV - NP}{N} \times 10D$$

$$\frac{RV + NP}{2}$$

$$= 15 + \frac{100 - 90}{10} \times 10$$

$$\frac{100 + 90}{2}$$

$$= 16.84\ \%$$

(1)

3. Computation of Kd (Debentures)

$$Kd = \frac{I(1-t) + \frac{RV - NP}{3}}{\frac{RV + NP}{2}} \times 100$$

$$= \frac{14(1-0.40) + \frac{100 - 75}{6}}{\frac{100 + 75}{2}} \times 100$$

$$= \frac{8.4 + 4.17}{87.50} \times 100$$

$$= 14.37\%$$

Computation of Kd (13% loan)

0.50

$$Kd = I\frac{(1-t)}{100} \times 100 \quad 13\frac{(1-0.40)}{100} \times 100$$

$$= 7.8\%$$

4. Cost of Retained Earnings

As there is Floatation Cost & Personal Taxation

0.5D

$K_r = K_e = 19\%$.

Statement showing computation of WACC using market value weights.

Sr. No	Source	Amt	Propn	Cost	WACC
A	Equity	10400000 (500000 × 20.80)	0.6218	19%	0.1181
B	Preference Shares	4500000 (50000 × 90)	0.0269	16.84%	0.0045
C	14% Debentures	18750000 (25000 × 75)	0.1121	14.37%	0.0161
D	13% Loan	4000000	0.2392	7.80%	0.0187
		16750000	1.00		0.1574

$WACC = 15.74\%$

2. Computation of marginal cost of capital.

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

$$= \frac{3.12}{14} + 0.04 \times 100$$

$$= 26.29\%$$

$$K_d = \frac{(4000000 \times 13\%) + (6000000 \times 15\%)(1-t)}{10000000}$$

$$= \frac{520000 + 900000(1-0.40)}{10000000}$$

$$= 0.0852$$

That is 8.52%.

Statement showing computation of MCC

Sl. No	Source	Propn	Cost	MCC
A	Equity	0.60	21.29%	0.1577
B	Retained Earnings	0.20	26.29%	0.0526
C	Debt	0.20	8.52%	0.0170
				0.2273

MCC = 22.73%

thank you!