Cost of Capital

Cost =K

**Cost of Debt**

Kd=Interest Rate

Tax adjusted Cost of Debt capital Kd=Interest rate (1-t)

**Cost of Perpetual Debt Capital**

Kd=Interest/Sale Proceeds

Tax adjusted Cost of Perpetual Debt Capital =

Kd=Interest(1-t)/Sale Proceeds

**Cost of Redeemable Debt**

Kd=Interest(1-t)+(M-P)/N

(M+P)/2

M=Par or Maturity value or redemption value

P=Debt’s Issue Price or its Purchase price or Net realized Value

(M-P)=Debt Premium

N= Life of Debt or number of years to maturity

Kd=Yield to Maturity

YTM=Interest(1-t)+(M-P)/N

(M+P)/2

Current Yield

Current Yield = (Annual Interest / Market price of Debt)X100

Adjusted Current yield= (Annual Int/Market price ) x 100 + (100-Market price)/Years to Maturity

Problems and Solutions

1.A company borrows Rs.100000 for 1 year at 10%.   
The cost of Debt is Rs.10000, which is the annual interest.   
Determine the after tax cost of debt if the corporate tax rate is 50%. If the govt.in the subsequent year changes the tax rate to 40%, then what will be the cost of Debt?

Solution:

Cost of Debt = 10% (1-50%) Ans -Kd=5%

Cost of Debt = 10% (1-40%)Ans-Kd=6%

2.The Financials of two companies are given below; you are required to analyze which company has more effective leverage impact?

|  |  |  |
| --- | --- | --- |
| Particulars | Co X Rs in ‘000s | Co Y Rs in ‘000s |
| EBIT | 100 | 100 |
| I | - | 30 |
| EBT | 100 | 70 |
| Tax @ 40% | 40 | 28 |
| EAESH | 60 | 42 |
| Total funds available to sh | 60 | 72 |

Solution : Company Y as it has higher Earnings available to its Share holders

3.A company issues a perpetual debt bearing an annual interest rate of 12%. The Current market price of the debt having face value of Rs 100 is Rs 107 and the current corporate tax rate is 40%. Determine the cost of Perpetual Debt of the given company.

Solution

Kd=Interest (1-t)/Sale Proceeds

Kd=Rs.12(1-.40)/107=0.0673 Ans-Kd=6.73%

4. XYZ Ltd. owns perpetual debt in its capital structure that amounts to Rs. 100000. The Rate of Interest on Debt is 14%. Given the corporate tax rate as 40%, calculate the cost of Debt capital under the following conditions:

a. At Par

b. 10% discount

c. 10% premium

Solution:

1. Kd=Rs.14000(1-.4)/Rs.100000 Ans-Kd=8.4%

SP at 10% discount= Rs 100000-Rs.10000 discount=Rs.90000

SP at 10% premium= Rs.100000+Rs 10000 premium=Rs 110000

Kd at 10% Premium=14000(1-.40)/110000=7.6%

Kd=Interest(1-t)/SP

Interest is 14% on Rs.100000=14000

Tax rate =40%

Kd at Par =14000(1-.40)/100000=8.4%

Kd at 10% discount=14000(1-.40)/90000=9.33%

Kd at 10% Premium=14000(1-.40)/110000=7.6%

**Redeemable Debt**

Current yield, YTM or Kd

5.Mr. X purchases a debenture having par value of Rs.100 for

Rs 95.92 and it paid an interest coupon rate of 5%.

1. Calculate its current yield.
2. Years to maturity is 2.5 years, calculate the Adjusted Current yield.

Solution:

Current yield= Annual Int/Market price

Current yield= {(Rs.5/95.92)} X100= 5.21%

Adjusted Current yield= {(Rs.5/95.92) X100} + [(100-95.92)/2.5]= 6.84%

**YTM Formula**

Yield to Maturity (YTM)=Interest(1-t)+(M-P)/N

(M+P)/2

M=Par or Maturity value or redemption value

P=Debt’s Issue Price or its Purchase price or Net realized Value

(M-P)=Debt Premium

N= Life of Debt or number of years to maturity

6.ABC Ltd. issues bonds of par value Rs 2000 at 12% int, on 8 % discount for 10 years. Calculate the YTM .

Solution:

Interest =12% on 2000 =240

M=Rs.2000

P=Rs.2000 @ discount of 8%= 2000X8%= 160

P 2000-160=Rs.1840

N=10 years

YTM=240+(2000-1840)/10

(2000+1840)/2 YTM=13.33%

Prob 7.Determine the cost of Capital in the following cases:

1. X ltd. issues 14% debentures of face value Rs.100 each and realized Rs. 90 per debentures. The debentures are redeemable after 10 years at a premium of 10%.
2. Y ltd. issues 12% preference shares of face value Rs.100 and realizes Rs 92 per share. The shares are repayable after 10 years at par.

The Corporate Tax applicable to both the firms are at 50%.

Solution:

Kd=Interest(1-t)+(M-P)/N

(M+P)/2

Interest =14% on Rs 100= Rs 14

M=Par or Maturity value or redemption value = Rs 110

P=Debt’s Issue Price or its Purchase price or Net realized Value Rs.90

(M-P) =Debt Premium Rs.20

N= Life of Debt or number of years to maturity=10 years

Kd= 14+(110-90)/10

(110+90)/2

Kd=16%

Kd= 14(1-.5)+(110-90)/10

(110+90)/2

Kd=9%

**Cost of Preference Shares**

Kp=Dividends +(M-P)/N

(M+P)/2

M=Par or Maturity value or redemption value

P=Preference shares Issue Price or its Purchase price or Net realized Value

(M-P) =Share Premium

N= Life of Preference shares or number of years to maturity

Prob 8.Y ltd. issues 12% preference shares of face value Rs.100 and realizes Rs 92 per share. the shares are repayable after 10 years at par.You are required to arrive at the Cost of the Preference Share.

Solution :

Dividends =12% on Rs 100= Rs 12

M= Rs.100

P=Rs 92

N=10 years

Kp=12 +(100-92)/10

(100+92)/2

Kp=13.33%

**Cost of Irredeemable Preference Shares**

Kp = D

P0

Floatation Cost – The cost to be borne by the company to issue/raise the capital

Kp = D

( P0 –f)

Prob 9.A company raised preference share capital of Rs 100000 by the issue of 12 % preference share of Rs 100 each. Find out the cost of preference share capital when it is issued at

a.12% premium

b.12% discount

Note: As the maturity period is not mentioned, it is assumed that the preference shares is issued perpetually /Irredeemable Preference Shares

Solution:

Kp= Dividends/Market price

1. @ 12% Premium Kp=12/112= 10.7%
2. @ 12% discount Kp=12/88= 13.63%
3. @ par Kp=12 /100= 12%

Prob 10.A company has 10% redeemable preference shares, which are redeemable at the end of 12th year from the date of issue. The underwriting expenses are expected to be 3 percent. Find out the cost of Preference Shares.

Solution:

Note: Floatation Cost to the Company – Has to be deducted from the Issue Price that is “P”

Kp=Dividends +(M-P)/N

(M+P)/2

Dividends= 10%

Face value is Assumed at Rs. 100 per share

Dividends = Rs 10

M=Rs.100

P=Rs 100-3% underwriting charge = Rs 100=Rs 3

P=Rs 97

N=12years

Kp=10(100-97)/12

(100+97)/2

Kp=10.40%

**IRREDEEMABLE PREFERENCE SHARES**

Kp=D/P0

Kp= D

Po-f

**Cost of Equity Capital**

1. Dividend Capitalization Model

Ke= D1 +g

P0

Ke= D1 +g

P0-f

D1 =Dividend to be earned a year later

P0= Market price of the share a year later or market capitalization or annual capitalization

g=growth rate

f= floatation cost if any

Perspective 1

From company’s point, the Ke is the cost to the company

Perspective 2

From investor’s point Ke is the returns for his investment

2. CAPM Model –Capital Asset Pricing Model William Sharpe

Ke=Rf+β (Rm-Rf)

Ke =Cost of Equity Capital

Rf=Risk free rate of return

Rm = the rate of return on the Market portfolio

β = is the beta of the security, sensitivity of security to market movement, relationship of security with the market

Rm-Rf =Risk Premium

Prob 11.Dividend per share of a firm is Rs.1. The cost of Equity is expected to grow at 5% per annum perpetually. Calculate the cost of equity capital, assuming the market price per share as Rs.20.

Solution:

Ke = 1 +.05 Ke=.05+.05= .1 Ke=.1X100=10%

20

Prob 12.From the given data, calculate the cost of Equity share of X ltd.

1. Current market price of the share is Rs 120

2. Floatation cost per share is Rs.5

3. Dividend paid on outstanding shares for the past 3 years is shown in the table below:

|  |  |
| --- | --- |
| Year | Dividend in Rs. |
| 1 | 10.5 |
| 2 | 12.5 |
| 3 | 14.5 |

The expected dividends on the new shares at the end of the current year is Rs. 15.

Solution :

Ke= D1 +g

P0-f

Step 1 : Calculation of g

Over the 3 years, dividends have been increasing from Rs. 10.5 to Rs. 14.5 giving a compound factor dividend growth of 14.5/10.5 = 1.38.

Step 2 : We look for this growth compound factor value 1.38 in the future value table A1 in 3 years row.   
To identify the growth rate.

Step 3: At 11%, we get 1.3676. Thus a sum of Rs1 would amount to Rs 1.37 in 3 years at 11%. So the dividend growth rate is 11%.

Ke= D1 +g

P0-f

Ke= 15 +11% Ke=24.04%

120-5

Prob 13.New Alliance Ltd. gives dividend to its shareholders of Rs 2 per share. The growth rate of dividends is 5% and is expected to remain constant. The current market price per share is Rs 60 and the floatation cost per share is Rs.2 .Calculate the cost of new issue for New Alliance Ltd.

Solution:Ke= 2 +.05=8.44%

( 60-2)

Prob 14.Jaguar Plastic Corporation expects to pay Rs 6 dividend this year to the common shareholders. The past records show that dividends have grown by 2 % each year .Jaguar’s common stock has a current market price of Rs 145 per share. Determine its cost of capital. Suppose the market price is Rs. 45 , what is the cost of capital ?what do you infer from the changes in the market price of the share ?

Solution:

Ke= 6 +.02= 6.14% Ke is 15.3% if market price is Rs.45

145

**Capital Asset Pricing Model most widely used**

Ke=Rf+β(Rm-Rf)

Ke =Cost of Equity Capital

Rf=Risk free rate of return earned by all investors ( such as government securities ,bank rate )

Rm = the rate of return on the Market portfolio/rate of return earned in the market ( such as BSE index or NSE Index)

β = is the beta coefficient of the security, sensitivity of security to market movement, relationship of security with the market.

It expresses the market risk of the equity stock in relation to the market

Prob 15.Bharatware Corporations has equity stock with a listed β of 1.35. The estimated market returns is 12% and the risk free rate based on the govt. bonds is 6.5%. Calculate the cost of Equity based upon the CAPM.

Solution:

Ke=Rf+β(Rm-Rf)

Ke=6.5%+1.35(12%-6.5%)=13.9%

Prob 15a.Assume that Rf is 9% and Rm is 18% . If a security has a beta factor of

1. 1.4
2. 1.0
3. 2.3
4. .9 , determine the expected return of the security.

Solution:

Ke=Rf+β(Rm-Rf)

Ke=9%+1.4(18%-9%)=21.6%

Ke=9%+1(18%-9%)=18%

Ke=9%+2.3(18%-9%)=29.7%

**Cost of Retained Earnings/Ploughing back of profits**

Kre=Ke

Kre=Ke

If there is floatation cost

Kre=Ke(1-f)

Prob 16.Using the information given in the table below, calculate the market portfolio returns and the expected returns on security using CAPM. The risk free return is 14%

Portfolio of an Investor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Investment | Initial Price  1 | Dividends  2 | Year- end Market price -3 | Beta  4 |
| Shares of Cement | 30 | 3 | 50 | .8 |
| Shares of steel | 45 | 3 | 60 | .7 |
| Shares of Liquor | 55 | 3 | 135 | .5 |
| Govt. Sector firms | 1000 | 150 | 1015 | .99 |

**Solution:**

Hint:Rf=14%

Beta is given

Rm=???

**Calculation of Return on Portfolio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Investment | Dividends | Capital appreciation  (3-1) | Total Returns | Investment |
| Shares of Cement | 3 | 50-30=20 | 23 | 30 |
| Shares of steel | 3 | 60-45=15 | 18 | 45 |
| Shares of Liquor | 3 | 135-55=80 | 83 | 55 |
| Govt. Sector firms | 150 | 1015-1000=15 | 165 | 1000 |
| Total | 159 | 130 | 289 | 1130 |

Total Investment =1130

Returns=289

Rm=( Returns/ total investment) X100

Rm=(289/1130)X100=25.57%

Market Portfolio return Rm=(289/1130)X100=25.57%

|  |  |  |
| --- | --- | --- |
| Investment | CAPM | Returns |
| Shares of Cement | 14%+.8(25.57%-14%) | 23.2% |
| Shares of steel | 14%+.7(25.57%-14%) | 22.1% |
| Shares of Liquor | 14%+.5(25.57%-14%) | 19.78% |
| Govt. Sector firms | 14%+.99(25.57%-14%) | 25.57% |

Prob 17.A company is considering raising of funds above Rs.10 million by one of the following two possible alternatives:

1. 16% institutional loan
2. 14% non-convertible debentures

Cost of issuing debentures at a discount of 2.5% is Rs 100000. Assume a tax rate of 50%. What alternative should the firm adopt?

Solution:

1. 16% Institutional Loan

Kd=Int(1-t) Kd=16%(1-.5)=8%

2.14% non-convertible debentures

14% Debentures

Kd=Int(1-T) Rs. 14(1-.5) Kd=7.17%

P0 Rs.97.5

14% on Rs 100 face value = Rs 14 is the interest

Discount of 2.5%, hence market price is Rs100.

The market price at 2.5% discount is 100-2.5 =Rs.97.5

**Cost of Retained Earnings**

Prob 18.Nonvertis Ltd. received Rs 10million of retained earnings and Rs. 10 million of equity through a new issue. The equity holders expect a desired return of 18%. The cost of issuing external equity is 4%. Determine the cost of retained earnings and the cost of external equity.

Ke=18%

Flotation cost =4%

Kre=Ke(1-f) 18%(1-4%)= 17.28%

**Calculation of Weighted Average Cost of Capital**

WACC weigh each specific individual capital proportionately. WACC incorporates all the capital sources used by the firm.

Steps for calculating WACC

1. Determine the cost of all the individual components of capital used by the firm.

* Debt –borrowed capital
* Equity capital
* Preference Share
* Retained Earnings

1. Develop value based capital structure (means to compute the value of all the individual capital).
2. Assign weight to each source of capital. The weight is the proportion of each source of funds in the capital structure.
3. Multiply the individual cost of capital with the respective weights and total it up to arrive at the weighted average cost of capital.

Value as in step 2 may be based on Book value weights or Market value weights.

WACC= Wd(Cost of Debt)+We(Cost of Equity)+Wp(Cost of preference shares)+Wre(Cost of Retained earnings

Assign Book Value Weights

Prob 19.A firm has debt in the form of 3000 bonds each of face value Rs 1000 issued at par. The book value of the bond would be Rs 2000000. The table below shows the different funds raised by the company you are required to calculate the book value weights of the funds

|  |  |  |
| --- | --- | --- |
| Capital | Amount | Book Value Weights |
| Debt 3000 bonds at par of Rs 1000 each | 3000000 | 0.35 |
| Preferred Stock 5000 shares of Rs 100 each | 500000 | 0.05 |
| Equity shares (500000 shares of Rs 10 each) | 5000000 | 0.58 |
| Total book value of capital | 8500000 |  |

|  |  |  |
| --- | --- | --- |
| Capital | Amount | Market Value Weights |
| Debt 9000 bonds at Rs.300 | 27,00,000 | 0.063 |
| Preferred Stock 5000 shares of Rs 90 each | 4,50,000 | 0.01 |
| Equity shares (500000 shares of Rs 80 each) | 4,00,00,000 | 0.93 |
|  | 4,31,50,000 |  |

**Market Value weights**

Prob 19.A firm has 9000 bonds at Rs.300 market price per bond, 5000-preference shares traded at Rs 90 per share and 500000-equity share at Rs 80/per share market price. Assign the market value weights to the different source of funds.

Practice problem

Prob 20. The following is the capital structure of a firm

|  |  |
| --- | --- |
| Capital | Rs. In lakhs |
| Equity capital (10 lakh shares at par value) | 100 |
| 12% Preference capital (10000 shares at par value) | 10 |
| Retained earnings | 120 |
| 14% non-convertible debentures (70000 debentures at par ) | 70 |
| 14% term loan from SFC | 100 |

The market price per equity share is Rs.25. The next expected dividend per share is Rs.2 and the dividends per share is expected to grow at a constant rate of 8%.

The preference shares are redeemable after 7 years at par and are currently quoted at Rs 75 per share in the stock exchange.

The debentures are redeemable after 6 years at par and their current market quotation is Rs 90 per debentures.

The tax rate applicable to the firm is 50%. You are required to arrive at WACC based on Book value and Market

Solution :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Capital | Rs. In lakhs | Cost of capitals | Book value wts. | CoCXwts |
| Equity capital (10 lakh shares at par value) | 100 | Ke= 2 +8% 25  Ke=16%  0.16 | 0.25=100/400 | 0.16X.25=.04X100=4% |
| 12% Preference capital (10000 shares at par value) | 10 | Kp=12+(100-75)/7  (100+75)/2  Kp=17.8% | 0.025 | .4% |
| Retained earnings | 120 | Kre=Ke=16% | 0.3 | 4.8% |
| 14% non-convertible debentures (70000 debentures at par ) | 70 | Kd=  14(1-.5)+(100-90)/6  (100+90)/2  =9.1% | 0.175 | 1.59% |
| 14% term loan from SFC | 100 | Kd=Int(1-t)  Kd=14%(1-.5)=7% | 0.25 | 1.75% |
|  | 400 |  |  | 12.54% |

1000000/10000=Rs.100

Dividends =12% on Rs 100 =Rs 12

M=Maturity value Rs.100

P=Realised market value or issue price= Rs.75

N=7years

WACC at Book Value =12.54%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Capital | Rs. In lakhs | Cost of capitals | Market value wts. | CoCXwts |
| Equity capital (10 lakh shares at par value) | 250 | Ke= 2 +8% 25  Ke=16%  0.16 | 0.46 | 7.36% |
| 12% Preference capital (10000 shares at par value) | 7.5 | Kp=12+(100-75)/7  (100+75)/2  Kp=17.8% | 0.013 | .23% |
| Retained earnings | 120 | Kre=Ke=16% | 0.22 | 3.52% |
| 14% non-convertible debentures (70000 debentures at par ) | 63 | Kd=  14(1-.5)+(100-90)/6  (100+90)/2  =9.1% | 0.11 | 1.0% |
| 14% term loan from SFC | 100 | Kd=Int(1-t)  Kd=14%(1-.5)=7% | 0.18 | 1.26% |
|  | 540.5 |  |  | 13.37% |

WACC based on market value = 13.37%

Prob 21.A company has 10% redeemable preference shares, which are redeemed at the end of 12 years from the date of issue. The underwriting commission is expected to be Rs 3.Find the cost of preference share.

Solution:

D = 10% on face value Rs 100= Rs 10

F = Rs. 3

M=Rs.100

P=Rs.100-Rs.3=Rs.97

N=12

Kp=10+(100-97)/12 Cost of Preference shares = 10.4%

(100+97)/2

Prob 22.The table below shows the capital structure of X ltd. Determine the WACC of the firm based on the Book value wts

|  |  |  |
| --- | --- | --- |
| Source of fund | Amount in Rs | Cost |
| Preference Shares | 200000 | 12% |
| Equity Share Capital | 300000 | 15% |
| Retained Earnings | 150000 | 15% |
| Debentures | 350000 | 10% |
| Total |  |  |

Solution:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of fund | Amount in Rs | Cost | wts | Wts XCost |
| Preference Shares | 200000 | 12% | .2 | 2.4 |
| Equity Share Capital | 300000 | 15% | .3 | 4.5 |
| Retained Earnings | 150000 | 15% | .15 | 2.25 |
| Debentures | 350000 | 10% | .35 | 3.5 |
| Total | 1000000 |  | WACC | 12.65% |

Prob 23.The balance Sheet of XYZ ltd. reveals the information given below

|  |  |
| --- | --- |
| Source of Fund | Amount in Rs in millions |
| Equity capital | 400 |
| 12% debentures | 600 |
| 16% term loan | 1000 |
| Total | 2000 |

Calculate:

1. The WACC of the company.
2. The company as a rule pays constant dividend at the rate of 20% p.a.
3. What difference will it make if the current price of Rs 100 face value share is sold at Rs 150?
4. The effect of tax on the cost of capital under both the condition (tax rate is 50 %)

Solution:

Cost of Equity =Ke=20%

Cost of Equity =Ke=D1/ Market price

Dividend is 20% on Rs 100= Rs.20

Market price =Rs 150

Ke=20/150=13.33%

Cost of Debt term loan without tax Kd=16%

Cost of Debt term loan with tax Kd=16%(1-.5)=8%

Cost of Debentures without tax Kd = 12%

Cost of Debentures with tax Kd = 12%(1-.5)=6%

Calculation of WACC when cost of Equity is 20% and Cost of Debt is considered with tax

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | CoC | wtsxcoc |
| Equity capital | 400 | .2 | 20% |  |
| 12% debentures | 600 | .3 | 6% |  |
| 16% term loan | 1000 | .5 | 8% |  |
| Total | 2000 |  | Wacc= | 9.8% |

Calculation of WACC when cost of Equity is 13.33% and Cost of Debt is considered without tax

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | CoC | wtsxcoc |
| Equity capital | 400 | .2 | 13.33% | 2.66 |
| 12% debentures | 600 | .3 | 12% | 3.6 |
| 16% term loan | 1000 | .5 | 16% | 8.0 |
| Total | 2000 |  | WACC= | 14.26% |

Cost of Term Loan= 16% (1-.5) =8%

Calculation of WACC with the Tax= 8.46%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | Cost of capital | WtsXCOC |
| Equity capital | 400 | .2 | 13.33% | 2.66 |
| 12% debentures | 600 | .3 | 6% | 1.8 |
| 16% term loan | 1000 | .5 | 8% | 4 |
| Total | 2000 |  | WACC | 8.46% |

Calculation of WACC without the Tax rate

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | Cost of capital | wtsxcoc |
| Equity capital | 400 | .2 | 13.33% | 2.66 |
| 12% debentures | 600 | .3 | 12% | 3.6 |
| 16% term loan | 1000 | .5 | 16% | 8.0 |
| Total | 2000 |  | WACC | 14.26% |

Calculation of WACC when the cost of Equity is considered at the rate of Dividends paid Ke=20%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | Cost of capital | wtsxcoc |
| Equity capital | 400 | .2 | 20% | 4 |
| 12% debentures | 600 | .3 | 12% | 3.6 |
| 16% term loan | 1000 | .5 | 16% | 8.0 |
| Total | 2000 |  | WACC | 15.6% |

Calculation of WACC when the cost of Equity is considered at the rate of Dividends paid Ke=20% and with tax

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Fund | Amount in Rs in millions | wts | Cost of capital | WtsXCOC |
| Equity capital | 400 | .2 | 20% | 4 |
| 12% debentures | 600 | .3 | 6% | 1.8 |
| 16% term loan | 1000 | .5 | 8% | 4 |
| Total | 2000 |  | WACC | 9.8% |
|  |  |  |  |  |

COC

|  |  |  |  |
| --- | --- | --- | --- |
| When COE | 20% | 13.33% | Decision |
| WACC with Tax | 9.8% | 8.4% | 8.4% |
| WACC without Tax | 15.6% | 14.2% |  |

Prob 24.The following information is available from the balance sheet of NEHAR Cosmetics Ltd.

Tax rate for the company is 50%. The equity dividend is 12%.   
Calculate the WACC for the data given

|  |  |
| --- | --- |
| Sources of Funds | Amount in Rs |
| Equity Share Capital 25000 shares at Rs 10 each | 250000 |
| Reserves and Surplus | 150000 |
| 9% Debentures | 100000 |

Also the below table shows the firm’s capital structure, you are required to calculate the WACC for the same.

|  |  |  |
| --- | --- | --- |
| Sources of Funds | Amount in Rs | Proportion |
| Equity Share Capital 25000 shares at Rs 10 each | 250000 | 50% |
| Reserves and Surplus | 150000 | 30% |
| Net worth | 400000 | 80% |
| 9% Debentures | 100000 | 20% |
| Total | 500000 | 100% |

Solution:

Calculation of individual cost of Capital

Ke = 12%

Kre=12%

Kd=9%(1-.5)

Kd=4.5%

|  |  |  |  |
| --- | --- | --- | --- |
| Sources of Funds | Amount in Rs | Proportion | COC |
| Equity Share Capital 25000 shares at Rs 10 each | 250000 | 50% | 12% |
| Reserves and Surplus | 150000 | 30% | 12% |
| Net worth | 400000 | 80% |  |
| 9% Debentures | 100000 | 20% | 4.5% |
| Total | 500000 | 100% |  |

WACC=10.5%

Prob 25.You are required to ascertain the most desirable capital structure for the given data of a firm. The following estimates of cost of debt capital after tax is made at various levels of debt equity mix.

|  |  |  |
| --- | --- | --- |
| Debt as %age of total capital employed (1) | Cost of Debt in %(2) | Cost of Equity in %(3) |
| 0 | 7 | 16 |
| 10 | 7 | 16 |
| 20 | 7.5 | 16.5 |
| 30 | 7.5 | 17 |
| 40 | 8.5 | 18 |
| 50 | 8.5 | 19 |
| 60 | 9.5 | 20 |
|  |  |  |

Solution:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Debt as %age of total capital employed  (1) | Cost of Debt in %  (2) | Equity as %age of total capital employed  (3) | Cost of Equity in %  (4) | WACC={[1x2]+[3x4]} |
| 0 | 7 | 100 | 16 | {[0x7]+[.1x16]}=16% |
| 10 | 7 | 90 | 16 | {[.1x7]+[.2x16]}=15.1% |
| 20 | 7.5 | 80 | 16.5 | {[.2x7.5]+[.3x16.5]}=14.7% |
| 30 | 7.5 | 70 | 17 | {[.3x7.5]+[.4x17]}=14.15% |
| 40 | 8.5 | 60 | 18 | {[.4x8.5]+[.6x18]}=14.20% |
| 50 | 8.5 | 50 | 19 | {[.5x8.5]+[.5x19]}=13.75% |
| 60 | 9.5 | 40 | 20 | {[.6x9.5]+[.4x20]}=13.7% |
|  |  |  |  |  |

The combination of Debt Equity where in the WACC of capital is the lowest is considered to be as the Optimal Capital structure for the company.

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