Name _____

Class _____

Professor's Name _Cost of Preference Share_ Prof's Signature _____

Q X Co. Ltd. issues 6,000 12% Pref. Shares of Rs 100 each at a Premium @ 10% but redeemable at a Premium @ 20% after 8 years. The cost of issue is Rs 5 per Share. you are required to determine the cost of Pref. Sh. Capital if dividend tax is considered, @ 15%.

Solution:—

Computation of net Proceeds of the Shares.

F.V of the Shares (6,000 × 100)	6,00,000
Add:- Premium of issue of Shares (6,00,000 × 10%)	60,000
Issue Price.	6,60,000
(-) Cost of issue (5×6,000)	30,000
Net Sale Proceeds of the Shares (P).	6,30,000

Computation of Effective Rate of dividend tax.

	%
Tax on dividend	15.00
Add. Surcharge @ 10% of 15	1.50
	16.50
Add: Education Cess @ 2% of 16.50	0.330
Add:- Secondary and Higher Education Cess @ 1% of 16.50	0.165
Effective Rate of Dividend tax (Dt)	16.995

If K_p = Cost of Pref. Sh. Capital

$$K_p = \frac{D(1+D_t) + \left(\frac{R-P}{n}\right)}{\frac{R+P}{2}}$$

$$= \frac{72,000\left(1 + \frac{16.995}{100}\right) + \left(\frac{7,20,000 - 6,30,000}{8}\right)}{\frac{7,20,000 + 6,30,000}{2}}$$

$$= 14.15\%.$$

Cost of equity capital

6 Possible approaches for calculation of equity capital.

(1) Dividend yield Method (DY): — Cost of equity capital will be. that rate of expected future dividends. which will maintains the. Present market price of equity shares.

$$K_e = \frac{DPS}{NPS} \Big/ \frac{DPS}{MPS}$$

Where, DPS: — Expected dividend per share.
NPS: — Net Proceeds per share.
MPS: — Market Price Per Share.

Q1. Sun Ltd. issues 10,000 equity Shares @ Rs 100 each at a Premium of 10%. The Company Pays 5% of the issue price as underwriting Commission. The equity Shareholders expects the rate of dividend to 20%. Calculate the Cost of new equity share Capital. If the MPS is Rs 160 t, them find Cost of Equ. Capital.

Solutions $K_e = \frac{DPS}{NPS}$

DPS = 5% of 100 = ₹ 20.
NPS = 100 + (10% of Rs 100) - 5% of 110 = Rs 104.50.

$$K_e = \frac{20}{104.50} = \boxed{19.14\%}$$

Again; $K_e = \frac{20}{160} = \boxed{12.5\%}$

(2) Dividend growth Model

Cost of equity share Capital is determined on the basis of the Expected dividend rate Plus the expected rate of growth in dividend.

$$K_e = \frac{DPS_1}{NPS} + g \quad or, \quad \frac{DPS_1}{MPS} + g.$$

Here, $DPS_1 = DPS_0 (1+g)$.

Where, DPS_1 = Expected dividend per share at the end of Current year.
NPS = Net Proceeds per Share
MPS = Market Price per Share.
g = Expected growth in rate of dividend
DPS_0 = Previous years dividend per Share.

Q2. SKF Ltd. has its shares of Rs 100 each, quoted on the stock exchange, the Current market price per share is ₹ 240. The dividend per share over the last four years have

been ₹ 12.00, ₹ 13.20, ₹ 14.50 and ₹ 16.00. Calculate the cost of equity shares. (Uni. B. Com (H) 2012).

Solution:—

The dividends per share over the last four years are growing approximately @10% and are expected to continue to grow at this rate.

This can be shown as :—

$$\frac{(₹13.20 - ₹12.00)}{₹12.00} \times 100 = 10\%, \quad \frac{(₹14.50 - 13.20)}{13.20} \times 100 = 9.85\%.$$

$$\frac{(16.00 - 14.50)}{14.50} \times 100 = 10.34\%.$$

$$\text{Simple Average} = \frac{10 + 9.85 + 10.34}{3} = 10.06\% \text{ or } 10\%.$$

The cost of equity share capital (K_e) will be —

$$K_e = \frac{DPS_0 (1+g)}{MPS} + g.$$

DPS_0 = Last year's dividend per share ie, ₹16.00.

MPS = Market price per share ie ₹ 240.

g = Expected growth rate of dividend @ 10%.

$$\therefore K_e = \frac{₹16.00 (1+0.10)}{240.} + 0.10.$$

$$= 0.0733 + 0.10.$$

$$= 0.1733 \text{ or } 17.33\%.$$

(3) **Earning yield Method**.

Total earnings of the company whether they are distributed as dividend or retained. (Since earnings = dividend. distributed + Retained earnings).

$$K_e = \frac{EPS}{NPS} \quad \text{or} \quad \frac{EPS}{MPS}.$$

EPS :— Earnings Per Share
NPS : — Net Proceeds. Per Share.

§ 3. R Ltd. is considering an expenditure of 250 for expanding its operations. The necessary information is as follows :—

Number of existing equity shares   4,00,000

After tax Profit (PAT) available to equity Shareholders. 80,00,000

Market price per share $\frac{1,20}{}$

Compute the cost of existing equity share capital and of new equity capital assuming that new shares will be issued, at a price of ₹105 per share and the floation cost of new issue will be ₹3 per share.

$$K_e = \frac{EPS}{MPS} \Big/ \frac{80,00,000}{4,00,000} = ₹20.$$

$$K_e = \frac{20}{120} = 16.67\%.$$

Cost of new equity share capital.

$$K_e = \frac{EPS}{NPS}.$$

Where, $NPS = ₹105 - 3 = ₹102$

$$K_e = \frac{20}{102} = 19.61\%.$$

(4) Earnings/Price plus growth approach, or Earning growth. Model.

$$K_e = \frac{EPS}{NPS} + g.$$

or $\frac{EPS}{MPS} + g$.

Q.4. Consider problem 3. and if the growth rate in earnings is given to be 5% p.a, find out cost of equity capital.

$$K_e = \frac{EPS}{MPS} + g$$

$$= \frac{20}{120} + 0.05$$

$$= 0.1667 + 0.05 = 0.2167 \text{ or } 21.67\%.$$

(5) Cost of Retained Earnings

Retained earnings are the funds. accumulated over the years by keeping a part of the funds generated without distributing to the equity shareholders of the company.

$$K_r = K_e (1-t)(1-b).$$

$K_e =$ Cost of equity share capital ie, required rate of return by the share holders.

$t =$ Shareholders Personal Income tax rate

$B =$ Brokerage expressed as Percentage.

Solution:- $K_r = Ke (1-t)(1-b)$.

Problems   XYZ Ltd is earning a net profit of ₹4,00,000. P.a.. The Shareholders required Rate of Return is 12%. The Shareholders of the Company are assumed to be in 30% personal tax bracket. It is expected that the Shareholders will have to incur 2% as brokerage on the after tax dividends received by them, Assuming that the entire earnings are distributed to the Shareholders. Calculate the cost of retained earnings of the Company.

$Ke = 12\%$

$t = 30\%$

$b = 2\%$

$K_r = 12\% (1-30\%)(1-2\%)$

$= 8.23\%$

Dividend receivable by the Shareholders   4,00,000.

(-) Personal Income tax @ 30%   (1,20,000)

After tax dividend   ⟶   2,80,000.

(-) Cost of brokerage @ 2% of 2,80,000   (5600)

Net amount available for Invest   2,74,400

∴ Earning on re-investment by the Shareholders 32,928

(12% of 2,74,400).

Cost of Retained Earnings = $\dfrac{32928}{4,00,000} \times 100 = 8.23\%$.

(6) Capital Asset Pricing Model (Important)

This model developed by William F. Sharpe and John Linter in the 1960s. wants to show a relationship between the unavoidable risk and expected return from a security.

This model is based on the following assumptions.

(a) Capital markets are highly efficient where investors are well informed.

(b) There are two type of investment opportunities. The first is risk free security. and the other is return on the Securities for the holding period.

$$R_i = R_f + (R_m - R_f) \times \beta_i$$

R_i : Expected return on ith security.

R_f : ROR an R_f (Risk free Securities).

R_m : Expected ROR on Market Portfolio.

β : Risk associated with ith security.

$$\boxed{\beta = \frac{cov(Sm)}{\sigma^2 m}} \quad \text{where,}$$

$$cov(Sm) = \frac{1}{n}\Sigma(R_s - \bar{R_s})(R_m - \bar{R_m}).$$

$$\bar{R_s} = \frac{\Sigma R_s}{m} = \text{Average rate of Expected Return.}$$

$$\bar{R_m} = \frac{\Sigma R_m}{n} = \text{Average rate of market return and}$$

$$\sigma^2 m = \frac{1}{n}(R_m - \bar{R_m})^2.$$

(1) $\beta > 1$ = Aggressive Share   (3) $\beta = 1$ Neutral Share

(2) $\beta < 1$ = Defensive Share

Q(*) (Imp) From the following information, Calculate the β.
and analyse the nature of the investment

| ERR (R_s) | 8 | 16 | -6 | 10 | 2 |
| MRR (R_m) | 10 | 12 | 8 | 5 | -10 |

R_s	R_m	$(R_s - \bar{R_s})$	$(R_m - \bar{R_m})$	$(R_s - \bar{R_s})(R_m - \bar{R_m})$	$(R_m - \bar{R_m})^2$
8	10	2	5	10	25
16	12	10	7	70	49
-6	8	-12	3	-36	9
10	5	4	0	0	0
2	-10	-4	-15	60	225
				$\Sigma 104$	$\Sigma 308$

$$\bar{R_s} = \frac{\Sigma R_s}{n} = \frac{30}{5} = 6.$$

$$\bar{R_m} = \frac{\Sigma R_m}{n} = \frac{25}{5} = 5$$

$$cov(Sm) = \frac{1}{n}\Sigma(R_s - \bar{R_s})(R_m - \bar{R_m}).$$

$$= \frac{1}{5} \times 104 = 20.80.$$

$$\sigma^2 m = \frac{1}{n}\Sigma(R_m - \bar{R_m})^2$$

$$= \frac{1}{5} \times 308.$$

$$= 61.6.$$

$$\beta = \frac{cov(Sm)}{\sigma^2 m} = \frac{20.80}{61.60} = 0.34$$

As the value of $\beta < 1$, so the nature of investment is defensive.

9. The Beta coefficient of H Ltd. is 1·5. The Company has been maintaining 6% rate of growth. In dividend and earnings. The last dividend paid was ₹8. per Share. Return on government securities is 12%. and the return on market Portfolio is 15%.. The current market price of each Share of the company is ₹75.

(i) What will be the Equilibrium price per Share of the company?

(ii) Would you advise purchasing the Share?

Solution:-

We know that, return on govt. securities is a risk free return.

$R_f = 12\%$, $\beta = 1·5$, $R_f = 12\%$, $R_m = 15\%$ and $R_s = ?$

$$R_s = R_f + \beta(R_m - R_f)$$
$$= 12\% + 1·5(15\% - 12\%)$$
$$= 12\% + 4·5\%.$$
$$= 16·5\%.$$

Again, $D_1 = D_0(1+g)$, where —

$D_1 = $ Current year's dividend.

$D_0 = $ Last year's dividend = ₹8/-

$g = $ growth rate of dividend = 0·06.

$D_1 = 8(1+0·06) = 8 \times 1·06 = ₹8.48.$

Now, $K_e = \dfrac{D}{P} + g.$

$K_e = $ Cost of Equity / Expected Rate of Return.

$$16·5 = \frac{8.48}{P} + 0.06$$
$$or, 0.165 - 0.06 = \frac{8.48}{P}$$
$$\therefore P = 80.76.$$

Hence, the equilibrium price of each share is ₹80.76.

(ii)   Market price of each share = ₹75.
equilibrium price = ₹80.76.

MP < P , So, the shares will be purchased.