4. CAPITAL STRUCTURE

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

Particulars	Plan A	Plan B	Plan C	Plan D
EBIT	15,00,000	15,00,000	15,00,000	15,00,000
Less: Interest	0	(1,80,000)	(3,00,000)	0
EBT	15,00,000	13,20,000	12,00,000	15,00,000
Less: Tax @ 50%	(7,50,000)	(6,60,000)	(6,00,000)	(7,50,000)
EAT	7,50,000	6,60,000	6,00,000	7,50,000
Less: Preference Dividend	0	0	0	1,50,000
EAESH	7,50,000	6,60,000	6,00,000	6,00,000
No. of Equity shares	80,000	60,000	50,000	60,000
EPS	9.375/-	11/-	12/-	10/-

Conclusion: From above computation we can decide that Plan 'C' i.e. Rs. 12 EPS is highest. So it is advised to company to Opt. 'Plan C'

PROBLEM NO: 2

Working Note: Calculation of Interest

Particulars	Option - I (50%)	Option - II (40%)	Option - III (60%)
a) Up to 40,00,000	6,00,000 (40 L x 15%)	6,00,000 (40 L x 15%)	6,00,000 (40 L x 15%)
b) 40,00,000 - 50,00,000	1,60,000 (10 L x 16%)	-	1,60,000 (10 L x 16%)
c) Above 50,00,000	-	-	1,80,000 (10 L x 18%)
Total	**7,60,000**	**6,00,000**	**9,40,000**

Evaluation of Financial Plans: **(Basing on EPS)**

Particulars	Option - I	Option - II	Option - III
a) EBIT	22,00,000	22,00,000	22,00,000
b) Interest (Refer WN)	(7,60,000)	(6,00,000)	(9,40,000)
c) EBT (a - b)	14,40,000	16,00,000	12,60,000
d) Tax @ 50%	(7,20,000)	(8,00,000)	(6,30,000)
e) EAT / EAESH	7,20,000	8,00,000	6,30,000
f) No. of Equity Shares	$1,25,000\left(\frac{\text{Rs. } 50,00,000}{\text{Rs. } 40}\right)$	$1,50,000\left(\frac{\text{Rs. } 60,00,000}{\text{Rs. } 40}\right)$	$1,25,000\left(\frac{\text{Rs. } 40,00,000}{\text{Rs. } 32}\right)$
g) EPS (e/f)	5.76	5.333	5.04

Note: company issue shares only at market price, because issue less No. of shares and increases sale proceeds but dividend can be paid only on face value of a share.

Conclusion: option-I is better because EPS more than other two options. As EPS maximize under option - I it is advisable to raise required capital in the proportion of Rs.50 lacks equity and Rs.50 lacks debt.

PROBLEM NO: 3

Particulars	Option - I	Option - II
EBIT (31,000 + 1,50,000 x 10%) ↓ Old EBIT ↓ Additional Shares	46,000	46,000
Less: Interest (W.N 1)	(4500)	(1000)
EBT	41500	45000
Less: Tax @ 35%	(14525)	(15750)
EAT/EAESH	26975	29250
No. of Equity shares (W.N 2)	5000	7000
EPS	5.395	4.178
P/E Ratio	6	7
Market price	32.37	29.25

WORKING NOTES 1: Calculation of interest on Debt

Option 1:

5% Debentures of Rs.20,000 i.e. 5% x Rs.20,000 = Rs.1,000

7% Debt of Rs.50,000 i.e. 7% x Rs.50,000 = Rs.3,500

= Rs.4,500

Option 2: 5% Debentures of Rs.20,000 i.e. 5% x Rs.20,000 = Rs.1000

WORKING NOTES 2: Calculation of number of equity shares to be issued:

Option 1: Existing $= \frac{50,000}{10}$ = 5,000 shares

Option 2: Existing $= \frac{50,000}{10}$ = 5,000 shares

New issue $= \frac{50,000}{25\,(M.P.S)}$ = 2,000 shares

= 7,000 shares

Decision: Since M.P under option - I is more than option - II, it is advisable to accept Option - I.

PROBLEM NO: 4

Calculation of EPS & Market price in each of the given options: **(Rs. In Lakhs)**

Particulars	Existing	Option I	Option II	Option III
EBIT (W.N-1)	15.00	22.5	22.5	22.5
	(100 x 15%)	(150 x 15%)	(150 x 15%)	(150 x 15%)
Less: Interest	1.75	1.75	1.75	6.75
	(25 x 7%)			(1.75 + 50 x 10%)
EBT	16.75	20.75	20.75	15.75
Less: Tax @ 40%	6.7	8.3	8.3	6.3
EAT	10.05	12.45	12.45	9.45
Less: Preference dividend	2.25	2.25	8.25	2.25
	(25 x 9%)		(2.25 + 50 x 12%)	
EAESH (A)	7.8	10.2	4.2	7.2
No. of equity shares (Lakhs)				
Existing	0.40	0.40	0.40	0.40
New	-	0.25	-	-
Number of Equity shares (B)	0.40	0.65	0.40	0.40
EPS (Rs.) (A/B)	19.5	15.69	10.5	18
PE ratio	-	25	20	15
Market price (EPS x PE ratio)	-	392.25	210	270

W.N-1: Calculation of EBIT

EBIT = 15% of capital employed

Capital employed (Before expansion):	Equity share capital	Rs. 40,00,000
	Debt	Rs. 25,00,000
	Preference share capital	Rs. 25,00,000
	Reserves and surplus	Rs. 10,00,000
		Rs.1,00,00,000

Capital employed (After expansion) = 1,00,00,000 + Additional Debt of Rs.50,00,000 = Rs. 1,50,00,000

EBIT, before expansion = 1,00,00,000 x 15% = Rs. 15,00,000

EBIT, after expansion = 1,50,00,000 x 15% = Rs. 22,50,000

Conclusion: The objective of Financial Management is to maximize the benefits of equity shareholders. Since market price is high in option I, it is beneficial to raise the funds of Rs.25,00,000 by way of fresh equity shares.

Assumption: The return on existing capital is given as 15%. It is assumed that the same rate of return will be maintained on additional investment also.

PROBLEM NO: 5

i) Computation of EPS under three-financial plans:

Plan 1: Equity Financing

EBIT	Rs. 62,500	Rs. 1,25,000	Rs. 2,50,000	Rs. 3,75,000	Rs. 6,25,000
Interest	0	0	0	0	0
EBT	Rs. 62,500	Rs. 1,25,000	Rs. 2,50,000	Rs. 3,75,000	Rs. 6,25,000
Less: Taxes 40%	25,000	50,000	1,00,000	1,50,000	2,50,000
PAT	Rs. 37,500	Rs. 75,000	Rs. 1,50,000	Rs. 2,25,000	Rs. 3,75,000
No. of equity shares	3,12,500	3,12,500	3,12,500	3,12,500	3,12,500
EPS	Rs. 0.12	0.24	0.48	0.72	1.20

Plan 2: Debt - Equity Mix

EBIT	Rs. 62,500	Rs. 1,25,000	Rs. 2,50,000	Rs. 3,75,000	Rs. 6,25,000
Interest	1,25,000	1,25,000	1,25,000	1,25,000	1,25,000
EBT	(62,500)	0	1,25,000	2,50,000	5,00,000
Less: Taxes 40%	25,000*	0	50,000	1,00,000	2,00,000
PAT	(37,500)	0	75,000	1,50,000	3,00,000
No. of equity shares	1,56,250	1,56,250	1,56,250	1,56,250	1,56,250
EPS	(Rs. 0.24)	0	0.48	0.96	1.92

*The Company will be able to set off losses against other profits. If the Company has no profits from operations, loses will be carried forward.

Plan 3: Preference Shares - Equity Mix

EBIT	Rs. 62,500	Rs. 1,25,000	Rs. 2,50,000	Rs. 3,75,000	Rs. 6,25,000
Interest	0	0	0	0	0
EBT	Rs. 62,500	Rs. 1,25,000	Rs. 2,50,000	Rs. 3,75,000	Rs. 6,25,000
Less: Taxes 40%	25,000	50,000	1,00,000	1,50,000	2,50,000
PAT	Rs. 37,500	Rs. 75,000	Rs. 1,50,000	Rs. 2,25,000	Rs. 3,75,000
Less: Pref. dividend	1,25,000*	1,25,000*	1,25,000	1,25,000	1,25,000
PAT for ordinary Shareholders	(87,500)	(50,000)	25,000	1,00,000	2,50,000
No. of equity shares	1,56,250	1,56,250	1,56,250	1,56,250	1,56,250
EPS	(0.56)	(0.32)	0.16	0.64	1.60

*In case of cumulative preference shares, the dividend gets accumulated if there is insufficient profit to pay dividend. If we assume it as non-cumulative preference shares, then in this case dividend amount will be lower of PAT and amount of preference dividend.

ii) The choice of the financing plan will depend on the state of economic conditions. If the company's sales are increasing, the EPS will be maximum under Plan II: Debt - Equity Mix. Under favorable economic conditions, debt financing gives more benefit due to tax shield availability than equity or preference financing.

iii) **EBIT - EPS Indifference Point : Plan I and Plan II:**

$$\frac{(EBIT^*)x(1-T_C)}{N_1} = \frac{(EBIT^* - Interest)x(1-T_C)}{N_2}$$

$$\frac{EBIT^*(1-0.40)}{3,12,500} = \frac{(EBIT^* - 1,25,000)x(1-0.40)}{1,56,250}$$

$$EBIT^* = \frac{3,12,500}{3,12,500-1,56,250} \times 1,25,00 = Rs.2,50,000$$

EBIT - EPS Indifference Point: Plan I and Plan III

$$\frac{EBIT^* x(1-T_C)}{N_1} = \frac{EBIT^*(1-T_C) - Pref.Div.}{N_2}$$

$$EBIT^* = \frac{N_1}{N_1-N_2} x \frac{Pref.Div.}{1-T_C} = \frac{3,12,500}{3,12,500-1,56,250} x \frac{1,25,000}{1-0.4} = Rs.4,16,666.67$$

PROBLEM NO: 6

Computation of Interest Rate on Debentures:

$$\frac{(EBIT - Interest)(1-t)}{No.\ of\ Equity\ Shares\ (N_1)} = \frac{EBIT(1-t) - Preference\ Dividend}{No.\ of\ Equity\ Shares\ (N_2)}$$

$$\frac{(2,72,000 - Interest)(1-0.5)}{8,000\ Shares} = \frac{2,72,000(1-0.5) - 40,000}{6,000\ Shares}$$

$$\frac{1,36,000 - 0.5\ Interest}{4} = \frac{1,36,000 - 40,000}{3}$$

$$1,36,000 - 0.5\ Interest = 1,28,000 \left(\frac{96,000}{3} x\ 4\right)$$

$$0.5\ Interest = 8,000$$

$$Interest = \frac{8,000}{0.5} = 16,000$$

$$Rate\ of\ Interest = \frac{Rs.16,000}{Rs.2,00,000} \times 100 = 8\%$$

PROBLEM NO: 7

Particulars	Proposal P	Proposal Q	Proposal R
EBIT	18,00,000	18,00,000	18,00,000
Less: Interest @ 10%	0	2,00,000	0
EBT	18,00,000	16,00,000	18,00,000
Less: Tax @ 50%	9,00,000	8,00,000	9,00,000
EAT	9,00,000	8,00,000	9,00,000
Less: Preference Dividend	0	0	2,00,000
EAESH	9,00,000	8,00,000	7,00,000
No of Equity Shares	2,00,000	1,00,000	1,00,000
EPS	4.5/-	8/-	7/-
EBIT for Financial Break Even Point $\left[Int + \frac{P.D}{1-Tax}\right]$	0	2,00,000	4,00,000 $\left(\frac{2,00,000}{0.5}\right)$

a) Indifference Point between plan P & plan Q

$$\frac{(x-0)(1-0.5)-0}{2{,}00{,}000} = \frac{(x-2L)(1-0.5)-0}{1{,}00{,}000}$$

2 [(x-2L) 0.5] = 0.5 x

2 [0.5x - 1L] = 0.5 x

1.0 x - 2L = 0.5 x

0.5 x = 2L

X = 4,00,000

b) Indifference Point between plan Q & plan R

$$\frac{(x-2L)(1-0.5)-0}{1{,}00{,}000} = \frac{(x-0L)(1-0.5)-2L}{1{,}00{,}000}$$

(x - 2,00,000) 0.5 = 0.5x - 2,00,000

0.5x - 1,00,000 = 0.5x - 2,00,000

There is no indifference point between plan Q & R

c) I.D.P between plan P & plan R

$$\frac{(x-0)(1-0.5)-0}{2{,}00{,}000} = \frac{(x-0)(1-0.5)-2L}{1{,}00{,}000}$$

$$\frac{0.5x}{2{,}00{,}000} = \frac{0.5x-2{,}00{,}000}{100000}$$

$$X = \frac{2{,}00{,}000}{0.25} = \text{Rs.8,00,000}$$

Analysis: It can be seen that financial plan Q dominates Plan R, since the financial BEP of former is only Rs.2,00,000 but in case of latter it is Rs.4,00,000

PROBLEM NO: 8

a) Calculation of indifference level

Let that level of EBIT be X

Particulars	Plan I	Plan II
A. EBIT	X	X
B. Less: Interest	4.00	5.20
C. EBT [A - B]	X - 4.00	X - 5.20
D. Less: Tax @ 50%	0.5 (X - 4.00)	0.5 (X - 5.20)
E. EAT [C - D]	0.5 X - 2.00	0.5 X - 2.60
F. No. of equity shares	6.40	6.00

Equating EPS under both the plans to find indifference point.

$$\frac{0.5X-2.00}{6.40} = \frac{0.5X-2.60}{6.00}$$

6.00 (0.5 x - 2.00) = 6.40 (0.5 X - 2.60)

3.00 x - 12.00 = 3.20 x - 16.64

3.00 x - 3.20 x = - 16.64 + 12.00

- 0.20 x = - 4.64

X = 4.64/0.20 = 23.20

Thus, indifference level of EBIT = Rs. 23,20,000

b) Calculation of financial BEP

Equality EPS under each plan equal to zero.

Financial BEP under plan I = $\frac{0.5X - 2.00}{6.40} = 0$

$0.5X - 2.00 = 0$

$X = 2.00/0.5 = 4.00$

Thus Financial BEP under Plan I = Rs.4,00,000

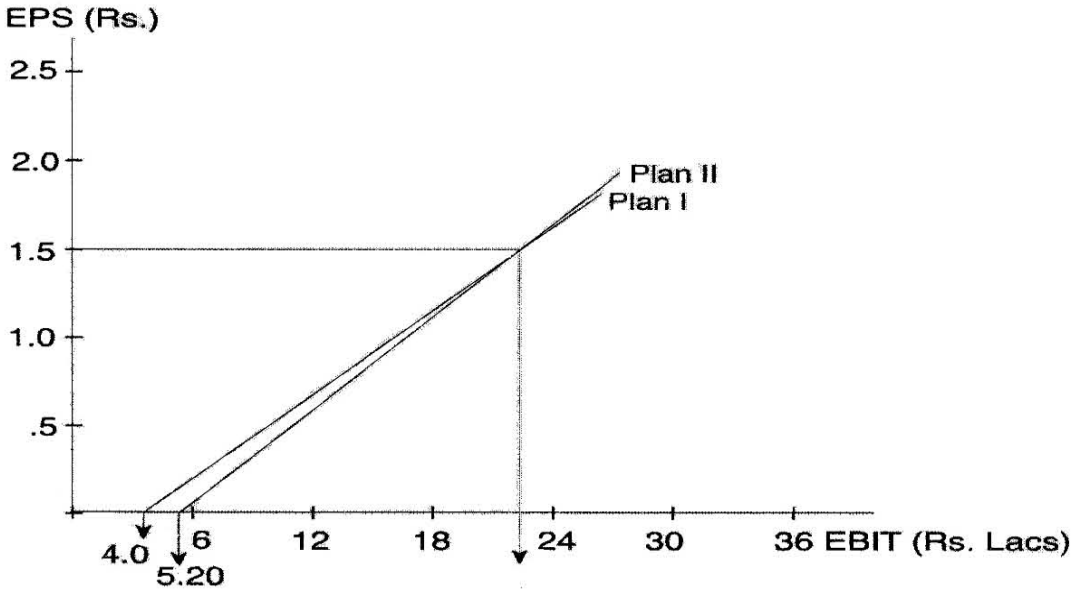
Financial BEP under plan II = $\frac{0.5X - 2.60}{6.00} = 0$

$= 0.5X - 2.60 = 0$

$X = 2.60/0.5 = 5.20$

Thus Financial BEP under Plan II = Rs.5,20,000

c) Graphical representation of EBIT - EPS, indifference point and financial Break-even levels



To the right of the indifference point Plan II is better, while Plan I is better for all values of EBIT below the indifference point. The horizontal intercepts identify the financial break-even levels of EBIT for each plan.

d) Choice of financial plan

EPS (Plan I) = $\left(\frac{\text{Rs. } 34,00,000 - \text{Rs. } 4,00,000(1 - 0.5)}{6,40,000 \text{ Shares}}\right)$ = Rs. 2.34 per share

EPS (Plan II) = $\left(\frac{\text{Rs. } 3,40,000 - 4,00,000 - 1,20,000\ (1 - 0.5)}{6,00,000 \text{ Shares}}\right)$ = Rs. 2.40 per share

In the absence of P/E ratio, choice of financial plan is to be made on the basis of EPS. Hence, plan II is better since EPS under plan II is greater than that under Plan I.

PROBLEM NO: 9

Working Note I: Estimation of EAESH

Particulars	Amount (Rs.)
a) EBIT	5,00,000
b) Interest	(2,00,000)
c) EBT	3,00,000

PART - A

a) Estimation of Market Value of Equity:

$$\text{Market Value of Equity} = \frac{EAESH}{k_e} = \frac{3,00,000}{16\%} = \text{Rs. } 18,75,000$$

b) Market value of Firm = Market Value of Equity + Market Value of Debt

= Rs. 18,75,000 + Rs. 20,00,000 = Rs. 38,75,000

PART - B

Estimation of k_o:

$$K_o = \frac{EBIT}{\text{Market Value of Firm}} = \frac{\text{Rs. } 5,00,000}{\text{Rs. } 38,75,000} \times 100 = 12.9\% \text{ or } 13\%$$

PROBLEM NO: 10

WN 1: Estimation of EAESH		WN 2: Calculation of Market Value of Firm	
Particulars	**Amount (Rs.)**	**Particulars**	**Amount (Rs.)**
a) EBIT	5,00,000	Market value of Firm = $\frac{EBIT}{k_o}$	= $\frac{\text{Rs. } 5,00,000}{0.15}$ = Rs. 33,33,333
b) Less: Interest	(1,50,000)		
EAESH	3,50,000		

WN 3: Estimation of Market Value of Equity:

Market value of Equity = Market Value of Firm - Market Value of Debt

= Rs. 33,33,333 - Rs. 15,00,000 = Rs. 18,33,333

Calculation of k_e: $\frac{EAESH}{\text{Market Value of Equity}} = \frac{\text{Rs. } 3,50,000}{\text{Rs. } 18,33,333} \times 100 = 19.09\%$

PROBLEM NO: 11

Company X	(Rs.)
Equity share capital	6,00,000
10% Debentures	9,00,000
Total assets	15,00,000
EBIT (20% on total assets)	3,00,000
Tax Rate	50%

Company Y	(Rs.)
Equity share capital	15,00,000
Total assets	15,00,000
EBIT	3,00,000
Tax Rate (20% on total assets)	50%
Capitalization rate	15%

i) Value of Both companies under Net Income Approach (NI)

Company X (geared company)	(Rs.)
EBIT (20% of total assets)	3,00,000
Less: Interest on debentures	90,000
EBT	2,10,000

Less: Tax @ 50%	1,05,000
Earnings available to equity shareholders	1,05,000
Equity capitalization rate (1,05,000/0.15)	15%
Market value of equity (S)	7,00,000
Market value of debt (B)	9,00,000
Market value of firm V = (S+B)	16,00,000

Company Y (Ungeared company)	(Rs.)
EBIT (20% of total assets)	3,00,000
Less: Tax @ 50%	1,50,000
Earnings available to equity shareholders	1,50,000
Equity capitalization rate	15%
Market value of equity (S) (1,50,000/0.15)	10,00,000
Market value of firm (V = S)	10,00,000

ii) Value of both companies under Net operating income approach (NOI)

Company X:

Value of equity $= \frac{EBIT(1-T)}{K_e} = \frac{3,00,000(1-0.50)}{0.15}$ = Rs. 10,00,000

Value of debt = 9,00,000 x 0.50 = Rs. 4,50,000

Value of firm = 10,00,000 + 4,50,000 = Rs. 14,50,000

Company Y:

Value of equity $= \frac{EBIT(1-T)}{K_e} = \frac{3,00,000(1-0.50)}{0.15}$ = Rs. 10,00,000

Value of firm = value of equity = Rs. 10,00,000

iii) Calculation of overall cost of capital of both companies under Net operating income approach (NOI)

Company X:

$$K_e = \frac{\text{Earnings available to equity shareholders}}{\text{Market value of equity}}$$

Market value of equity = Market value of firm = Market value debentures

= 14,50,000 - 9,00,000 = Rs. 5,50,000

$K_e = \frac{1,05,000}{5,50,000} \times 100$ = 19.09%

K_d = 10% (1 - 0.5)

Overall cost of capital (K_o)

$$K_o = 5\%\left(\frac{9,00,000}{14,50,000}\right) + 19.09\%\left(\frac{5,50,000}{14,50,000}\right)$$

= (0.05 x 0.60) + (0.1909 x 0.38) = 10.3%

Company Y:

Overall cost of capital (K_o) = 15%

PROBLEM NO: 12

Evaluation of different capital structures given in the problem:

% of debt	% of equity	Cost of debt(K_i)	Cost of equity(K_e)	WACC (K_o)
0%	100%	6%	11.5%	11.5%
10%	90%	6%	12%	6*10%+12*90%=11.4%
20%	80%	6%	12%	6*20%+12*80%=10.8%
30%	70%	6.5%	13%	6.5*30%+13*70%=11.05%
40%	60%	7%	15%	7*40%+15*60%=11.8%
50%	50%	7.5%	17%	12.25%
60%	40%	8%	20%	12.8%

Decision: since the WACC is minimum 20% of debt and 80% equity represents optimum capital structure

PROBLEM NO: 13

Calculation of M.V of Firm & K_o

Particulars	Existing	Prop I	Prop II
i) M.V of Debt	0	6,00,000	10,00,000
ii) M.V of Equity	$18,75,000 \left[\frac{3L}{16\%}\right]$	$14,11,764 \left[\frac{3L-0.6L}{17\%}\right]$	$9,00,000 \left[\frac{3L-1.2L}{20\%}\right]$
iii) M.V of Firm (i + ii)	18,75,000	20,11,764	19,00,000
iv) Over all COC (K_0)	16% $\left[\frac{18.75L}{18.75L}x16\%+0\right]$	14.91% $\left[\frac{6L}{2011764}(10\%)+\frac{1411764}{2011764}(17\%)\right]$	15.78% $\left[\frac{10L}{19L}(12\%)+\frac{9L}{19L}(20\%)\right]$

PROBLEM NO: 14

Value of unlevered firm V_n = EBIT (1-t) / K_e = Rs. 2,00,000 (1-0.35) / 0.2 = Rs. 6,50,000

Value of levered firm $V_L = V_u + B_t$ = Rs. 6,50,000 + [Rs. 6,00,000 (0.35)] = Rs.8,60,000

K_o of un levered firm = 0.20 ($K_e = K_o$)

K_o of levered firm

EBIT	Rs. 2,00,000
Less: Interest	90,000
	1,10,000
Net Income after interest	38,500
	71,500
NI for equity holders	8,60,000
Total Market value (V)	6,00,000
Market value of debt (V-B)	2,60,000
K_e = (NI ÷ S) = Rs. 71,500/Rs.2,60,000	0.275

$K_o = K_i (B/V) + K_e (B/V)$ = 0.0975 (Rs. 6,00,000/Rs.8,60,000) + 0.275 (Rs. 2,60,000/Rs.8,60,000) = 15.11%

PROBLEM NO: 15

a) Return to investor and Implied required rate of return:

EBIT	6,00,000
Less: Interest	-
EBT / EAESH	6,00,000

If investor owns 3% of stock of Gamma Ltd., he would get Rs. 18,000 (Rs. 6,00,000 x 3%)

Implied Rate of Return:

Since, there is no debt, overall cost of capital (K_O) = Cost of equity (K_e) = 20%

b) i) Implied required equity return of Delta Ltd.:

Since these firms are in No tax world, Market Value of Gamma = Market Value of Delta

Market value of Gamma = Market value of Equity (since there is no debt)

$$= \frac{\text{Earnings available to Equity Shareholders}}{K_O} = \frac{\text{Rs. 6,00,000}}{20\%} = 30,00,000$$

Market value of Delta = 30,00,000

EBIT	6,00,000
Less: Interest on Debt (12,00,000 x 10%)	(1,20,000)
EAESH	4,80,000
Market Value of Equity (30,00,000 x 60%)	18,00,000

$$K_e = \frac{Earnings\ available\ to\ Equity\ Shareholders}{Market\ Value\ of\ the\ equity} = 26.67\%$$

ii) Cost of Equity increases linearly as a function of its Debt - Equity Ratio. Therefore, Cost of Equity of Levered Firm (Delta) is always greater than Cost of Unlevered firm (Gamma Ltd.) Since, the shareholders of Delta Ltd. expects more return from Gamma Ltd.

Working Note:

Gamma Ltd.: $K_e = K_o + (K_o - K_d)$ (Debt/Equity) = 20% + 0 = 20%

Delta Ltd.: $K_e = K_o + (K_o - K_d)$ (Debt/Equity) = 20% + (20% - 10%) (40/60) = 20% + 6.67% = 26.67%

PROBLEM NO: 16

i) Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'A Ltd' (Unlevered) $V_u = \frac{EBIT(1-t)}{K_e} = \frac{Rs.2,50,000\,(1-0.30)}{20\%} = \frac{Rs.1,75,000}{20\%} = Rs.8,75,000$

Market Value of 'B Ltd.' (Levered)

$V_g = V_u + TB$

= Rs. 8,75,000 + (Rs. 10,00,000 × 0.30)

= Rs. 8,75,000 + Rs. 3,00,000 = Rs 11,75,000

ii) Computation of Weighted Average Cost of Capital (WACC)

WACC of 'A Ltd.' = 20% (i.e. $K_e = K_o$)

WACC of 'B Ltd.'

	B Ltd. (Rs.)
EBIT	2,50,000
Interest to Debt holders	(1,20,000)
EBT	1,30,000
Taxes @ 30%	(39,000)
Income available to Equity Shareholders	91,000
Total Value of Firm	11,75,000
Less: Market Value of Debt	(10,00,000)
Market Value of Equity	1,75,000
Return on equity (K_e) = 91,000 / 1,75,000	0.52

Computation of WACC B. Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	1,75,000	0.149	0.52	0.0775
Debt	10,00,000	0.851	0.084*	0.0715
Total	11,75,000			0.1490

*K_d = 12% (1- 0.3) = 12% × 0.7 = 8.4%

WACC = 14.90%

PROBLEM NO: 17

$$\frac{\text{Net income (NI) for equity - holders}}{K_e} = \text{Market Value of Equity}$$

$$\frac{\text{Net income (NI) for equity - holders}}{0.20} = \text{Rs. 1,140 lakhs}$$

Therefore, Net Income to equity-holders = Rs. 228 lakhs

EBIT = Rs. 228 lakhs / 0.7 = Rs. 325.70 lakhs

	All Equity (Rs. In lakhs)	Debt of Equity (Rs. In lakhs)
EBIT	325.70	325.70
Interest on Rs.200 lakhs @ 15%	-	30.00
EBT	325.70	295.70
Tax @ 30 %	97.70	88.70
Income available to equity holders	228	207

i) Market value of levered firm = Value of unlevered firm + Tax Advantage

= Rs. 1,140 lakhs + (Rs.200 lakhs x 0.3) = Rs. 1,200 lakhs

The impact is that the market value of the company has increased by Rs. 60 lakhs (Rs. 1,200 lakhs - Rs. 1,140 lakhs)

Calculation of Cost of Equity:

K_e = (Net Income to equity holders / Equity Value) x 100

= (207 lakhs / 1200 lakhs - 200 lakhs) x 100 = (207/ 1000) x 100 = 20.7 %

ii) Cost of Capital

Components	Amount (Rs. In lakhs)	Cost of Capital (%)	Weight	WACC (%)
Equity	1,000	20.7	83.33	17.25
Debt	200	(15% x 0.7) =10.5	16.67	1.75
	1,200			19.00

The impact is that the WACC has fallen by 1% (20% - 19%) due to the benefit of tax relief on debt interest payment.

iii) Cost of Equity is 20.7% [As calculated in point (i)]

The impact is that cost of equity has risen by 0.7% i.e. 20.7% - 20% due to the presence of financial risk.

Further, Cost of Capital and Cost of equity can also be calculated with the help of formulas as below, though there will be no change in final answers.

Cost of Capital (K_o) = K_{eu} (1-tL)

Where,

K_{eu} = Cost of equity in an unlevered company t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

$$K_o = 0.2 \times \left(1 - \frac{\text{Rs. 200 lakhs}}{\text{Rs. 1,200 lakhs}} \text{ x } 0.3\right)$$

So, Cost of capital = 0.19 or 19%

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d) \frac{\text{Debt } (1-t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$K_e = 0.20 + \left((0.20 - 0.15) \text{ x } \frac{\text{Rs. 200 lakhs x } 0.7}{\text{Rs. 1,000 lakh}}\right)$$

K_e = 0.20 + 0.007 = 0.207 or 20.7%

So, Cost of Equity = 20.70%

THE END