Questions	CAPITAL STRUCTURE	Questions	CAPITAL STRUCTURE
1	HW Typed	30	CW
2	HW Typed	31	CW
3	HW Typed	32	CW
4	CW	33	HW Typed
5	CW	34	CW
6	HW Typed	35	CW
7	Handwritten solution provided	36	CW
8	CW	37	CW
9	CW	38	CW
10	CW	39	CW
11	HW Typed	40	Handwritten solution provided
12	HW Typed	41	CW
13	Handwritten solution provided	42	CW
14	CW	43	CW
15	CW	44	Handwritten solution provided
16	CW	45	HW Typed
17	CW	46	CW
18	CW	47	HW Typed
19	Handwritten solution provided	48	HW Typed
20	CW	49	CW
21	CW		
22	CW		
23	HW Typed		
24	CW		
25	CW		
26	CW		
27	HW Typed		
28	CW		
29	Handwritten solution provided		

Q4 (i) Existing EBIT = ₹4,50,000

Existing Capital

ESC = 80,000 × 10 = ₹8,00,000

RE = ₹12,00,000

12% Debentures = ₹10,00,000

₹30,00,000

Existing RoI = $\frac{4,50,000}{30,00,000}$ = 15%

Expansion = ₹6,00,000

option ① Debt @ 12%

option ② Equity @ ₹10/-

Number of shares = $\frac{6,00,000}{10}$ = 60,000 shares

Statement for computation of EPS

Particulars	option ① Debt	option ② Equity
New Total EBIT (30L+6L) × 15%	5,40,000	5,40,000
− Interest		
old (10L × 12%)	− 1,20,000	− 1,20,000
New (6L × 12%)	− 72,000	-
EBT	3,48,000	4,20,000
− Tax 40%	− 1,39,200	− 1,68,000
EAT & EAES	2,08,800	₹ 52,000
÷ number of Eq shares	÷ 80,000	÷ 1,40,000
EPS	₹ 2.61	₹ 1.8

Advice:

① yes, the company should adopt expansion because we are able to earn same rate of return.

② Debt as a source of finance should be preferred because it provides higher EPS.

Sol(b)

Existing Capital

ESC = 10 lakh shares × ₹10 = ₹100L

PBT = EBIT = ₹60L

(as No Debt in present case)

New Project

Capital Required = ₹50L

PBT = ₹40L = EBIT

Additional Capital = 50L

(i) All Equity

ESC = 2L × 25 = 50L

₹50L / ₹25 Issue price

(ii) All Debentures

16% Debt = ₹50L

(iii) 50% ESC, 50% Debt

ESC = 0.5L × 50 = 25L

16% Debt = 25L

Number of shares = ₹25L / 50* Issue price = 0.5L

Main solution — **Statement for EPS Calculation**

Particulars	(i) All Equity	(ii) All Debt	(iii) 50% E × 50% D
Total EBIT (60+40)	₹100L	₹100L	₹100L
− Int old	−	−	−
Add New	−	16% × 50L = ₹8L	16% × 25L = ₹4L
EBT	₹100L	₹92L	₹96L
− Tax 50%	−₹50L	−₹46L	−₹48L
EAT	₹50L	₹46L	₹48L
÷ No of Equity shares	÷ 12L	÷ 10L	÷ 10.5L
EPS	₹4.17	₹4.60	₹4.57

Decision → Select option (b) using 100% Debt to raise additional funds of ₹50L, because it provides highest EPS.

Lot 1

Main Solution

Statement for Estimation of EPS

Particulars	Debt option	Equity option
Capital Structure		
Existing Equity 80000 x 10	8,00,000	8,00,000
ADS	12,00,000	12,00,000
12% Debt	10,00,000	10,00,000
New 12% Debt	4,00,000	x
Equity 40000 x 10	x	4,00,000
EBIT (34L x 14%)	4,76,000	4,76,000
– Interest		
old (10L x 12%)	–1,20,000	–1,20,000
New (4L x 12%)	–48000	x
EBT	308,000	356000
– Tax 50%	–154000	–178000
EAT	154000	178000
– Pref Dividend	–	–
EAES	154000	178000
÷ No of Shares	÷ 80000	÷ 1,20000
EPS	₹ 1.925/share	₹ 1.48/share

Advice: Select Debt option because it has higher EPS.

Sol 1

WN (1)

EBIT	4,20,000
− Interest (12% × 10L)	−1,20,000
EBT	3,00,000

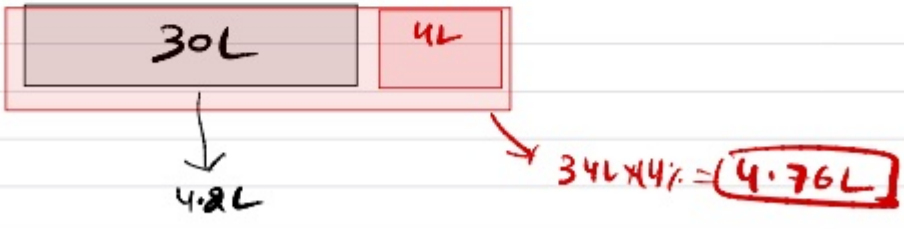
Existing Capital Structure

ESC ₹9000 × 10 =	8,00,000
12% Debentures =	10,00,000
Retained Earnings =	12,00,000
Capital employed =	30,00,000

Existing RoI = $\frac{EBIT}{CE} = \frac{4,20,000}{3,00,000} \times 100 =$ **14%**

WN (2) Expansion plan ⇒ ₹4,00,000.

Need EBIT = Total Need CE × RoI
= (30L + 4L) × 14% = ₹4,76,000



Sol(8) WN(i) Debt × 15% × $\frac{9}{12}$ = ₹112500

15% Debt = $112500 \times \frac{12}{9} \times \frac{1}{0.15}$ = ₹10,00,000

WN(ii) Given Statement (Corrected)

EBIT	18,00,000
− Int = 10L × 15% × 9/12	−1,12,500
EBT	16,87,500
− Tax 35% ~~DIT~~	−5,90,625
EAT & EAES	10,96,875
÷ Number of Shares	÷ 1,00,000
EPS (approx)	₹10.97
MPS (given)	₹109.7

original P/E Ratio = $\frac{109.7}{10.97}$ = 10 Times

WN(3) Existing Capital

ESC = 1,00,000 × 10 = ₹10,00,000

RE = ₹12,00,000

15% Debentures = ₹10,00,000

Capital employed = ₹32,00,000

Current EBIT = 18,00,000

ROI = $\frac{18,00,000}{32,00,000} \times 100$ = 56.25%

WN(4)

Additional fund required = ₹10L

↓

option(1)

Loans ₹10,00,000

option(2)

ESC $\frac{10,000}{\text{Shares}} \times 100$ = ₹10,00,000

option ① Debt used

Existing + New Capital

ESC 10L
RE 12L
+ 0 ⇒ Equity 22L

Debt 10L + 10L ⇒ 20L

Ratio $\frac{D}{D+E} = \frac{20}{20+22} = \frac{20}{42} \times 100$

Debt Equity ratio = 47.62% > 40%

↓

Paap!!!!

New P/E ratio = 10 - 25% = 7.5 Times

Additional Debt 10L

Int rate = 15% + 300 bps = 18%

option ② Equity used

Existing + New Capital

ESC 10L
RE 12L
+ 10L = 32L

Debt 10L = 10L

Ratio = $\frac{D}{D+E} = \frac{10}{10+32} \times 100$ = 23.80%

23.80% < 40%

↓

No Paap!!!!

New P/E ratio = 10 Times

Additional Debt
Int = NA

Main Solution

Particulars	Statement for MPS: Loan Option	Equity options
New EBIT = (32L+10L) × 56.25% =	₹23,62,500	₹23,62,500
− Int old (10L × 15%) =	− ₹1,50,000	− ₹1,50,000
New (10L × 18%) =	− ₹1,80,000	×
EBT	₹20,32,500	₹22,12,500
− Tax 35% ~~DDT~~	− ₹7,11,375	− ₹7,74,375
EAT & EAES	₹ 13,21,125	₹ 14,38,125
÷ no of Shares	÷ 1,00,000	÷ 1,10,000
EPS	₹ 13.21	₹ 13.07
× P/E ratio	× 7.5 Times	× 10 Times
MPS	₹ 99.075	₹ 130.7

Sol(3) WN(1) Expansion Capital Required = ₹25,00,000.

Expansion EBIT (Additional) = ₹5,00,000

Capital Requirement = ₹25L

option ①	option ②	option ③
Debt = ₹2,50,000	Debt = ₹10,00,000	Debt = ₹15,00,000
ESC = ₹22,50,000	ESC = ₹15,00,000	ESC = ₹10,00,000
Share Price = 150	Share Price = 150	Share Price = 125
$n = \frac{2250000}{150} = 15000$ Shares	$n = \frac{1500000}{150} = 10000$ Shares	$n = \frac{1000000}{125} = 8000$ Shares

Int rate upto 2.5L → 10%

2.5 – 10L → 15% (for next 7.5L)

above 10L → 20% (for last 5L)

Statement for selection of form of financing

Particulars	option ①	option ②	option ③
EBIT	5,00,000	5,00,000	5,00,000
– Interest			
upto first 2.5L @ 10%	–25000	–25000	–25000
Next 7.5L @ 15%	×	–₹112500	–112500
Last 5L @ 20%	×	×	–1,00,000
EBT	4,75,000	3,62,500	2,62,500
– Tax 50%	–2,37,500	–181250	–131250
EAT	2,37,500	1,81,250	1,31,250
÷ No of shares	÷ 15000	÷ 10000	÷ 8000
EPS	₹15.833	₹18.125	₹16.41

Advice: Select option ②, because it has highest EPS.

Sol to (a)(i) Existing Capital

ESC = 8,00,000 × 10 = ₹80L

RRS = ₹120L (given)

12% Debt = ₹100L

Capital employed = ₹300L

Existing EBIT = ₹52L

Existing RoI = 52L/300L × 100 = 17.33%

To Raise Additional = ₹40,00,000

(i) Debt Plan

	Existing	+ New
Equity	(80+120)	= 200
Debt	(100)	+ 40* = 140

D/(D+E) = 140/(140+200) = 41.18% > 35%

Poop!!!

P/E ratio = 8 Times

New Debt Int rate = 14%

(ii) Equity Plan

	Existing	+ New
Equity	(80+120)	+ 40* = 240
Debt	(100)	= 100

D/(D+E) = 100/(100+240) = 29.4% < 35%

No poop!!!

P/E ratio = 10 Times

New Debt = NA

W.K.T (3)

New EBIT = Total Capital (Old + New) × RoI = (300L + 40L) × 17.33% = 58,92,200

Main Solution

Q.10

Statement for Calculating MPS

Particulars	(i) Debt Plan	(ii) Equity Plan
New Total EBIT	₹ 5892200	₹ 5892200
− Int old	− 1200000	− 1200000
New (40L×14%)	− 560000	×
EBT	₹ 4132200	₹ 4692200
− Tax 50%	− ₹ 2066100	− ₹ 2346100
EAT or EAES	₹ 2066100	₹ 2346100
÷ Number of Shares	÷ 800000	÷ 960000*
EPS	₹ 2.58	₹ 2.443
× P/E ratio	× 8 Times	× 10 Times
MPS	₹ 20.66	₹ 24.43

W.N

$$\text{New Shares issued} = \frac{₹\,40,00,000}{₹\,25} = 160000 \text{ Shares}$$

$$\text{New Total Shares} = \underset{8,00,000}{\text{old}} + \underset{1,60,000}{\text{New}} = 9,60,000 \text{ Shares}$$

Q113 (i) Statement for Computation of EPS.

Particulars	Proposal P	Proposal Q	Proposal R
Equity	₹40,00,000	₹20,00,000	₹20,00,000
Debt (10%)	–	₹20,00,000	–
PSC (10%)	–	–	₹ 20,00,000
Expected EBIT	₹18,00,000	₹18,00,000	₹18,00,000
– Int (10% × 20L)	– 0	– ₹2,00,000	– 0
EBT	18,00,000	16,00,000	18,00,000
– Tax 50%	– 9,00,000	– 8,00,000	– 9,00,000
EAT	9,00,000	8,00,000	9,00,000
– Pref Div (20L × 10%)	– 0	– 0	– 2,00,000
EAES	9,00,000	8,00,000	7,00,000
÷ Number of Shares	÷ 2,00,000	÷ 1,00,000	÷ 1,00,000
EPS	₹ 4.5	₹ 8	₹ 7
(2) Financial BEP $\frac{Int + \frac{Pref\ Div}{(1-t)}}{}$	0	2,00,000	$0 + \frac{2L}{(1-50\%)} = 4,00,000$

(3) Indifference between P & Q

$$EPS_P = EPS_Q$$

$$\frac{(EBIT-0)(1-50\%)-0}{2,00,000} = \frac{(EBIT-2,00,000)(1-50\%)-0}{1,00,000}$$

$$\frac{EBIT}{2} = \frac{(EBIT-2,00,000)}{1}$$

₹ 4,00,000 = Indiff level EBIT

₹1 = Indiff level EPS

Indifference point between P & R

$$EPS_P = EPS_R$$

$$\frac{(EBIT-0)(1-50\%)-0}{2,00,000} = \frac{(EBIT-0)(1-50\%)-2,00,000}{1,00,000}$$

$$\frac{0.5\,EBIT}{2} = \frac{0.5\,EBIT-2,00,000}{1}$$

Indiff level EBIT = ₹8,00,000

Indiff level EPS = ₹2 per share

Indiff Point between Q & R

Not possible

We can see that Financial Proposal Q (Debt) dominates over Proposal R as we can see that

Financial BEP of Q is lower at ₹2,00,000 and EPS at Q is highest at ₹8.

Q.14

Plan (I)		Plan (II)	
ESC = 6900 Shares × ₹10	= ₹6,90,000	ESC = 4000 Shares × ₹10	= ₹4,00,000
12% Debt	= ₹4,00,000	14% PSC	= ₹2,00,000
	₹10,90,000	12% Debt	= ₹4,00,000
			₹10,00,000

For Indifference level

Step (1)

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - Int_1)(1-t) - PD_1}{n_1} = \frac{(EBIT - Int_2)(1-t) - PD_2}{n_2}$$

$$\frac{(EBIT - 48000)(1-0.35) - 0}{69000} = \frac{(EBIT - 48000)(1-0.35) - 28000}{40,000}$$

$$\frac{(EBIT - 48000) \times 0.65}{69000} = \frac{(EBIT - 48000)(0.65) - 28000}{40,000}$$

$$\frac{(EBIT - 48000) \times 0.65}{3} = \frac{(EBIT - 48000)(0.65) - 28000}{2}$$

$$2\left[(EBIT - 48000)(0.65)\right] = 3\left[(EBIT - 48000)(0.65) - 28000\right]$$

$$(EBIT - 48000)(1.30) = (EBIT - 48000)(1.95) - 84000$$

$$1.30\,EBIT - 62400 = 1.95\,EBIT - 93600 - 84000$$

$$1.30\,EBIT - 62400 = 1.95\,EBIT - 177600$$

$$177600 - 62400 = 1.95\,EBIT - 1.30\,EBIT$$

$$1,15,200 = 0.65\,EBIT$$

₹ 177231 = EBIT — Indifference level EBIT

Step (2) Now put EBIT = 177231 on L.H.S.

$$\frac{(177231 - 48000)(1-0.35) - 0}{60,000} = ₹1.04$$ = Indifference level EPS

Q15) WN 8 Total funds required = ₹4.5Cr

(I) Debt Equity 2:1

Debt = 4.5 × 2/3 = 3Cr

ESC = 4.5 × 1/3 = 1.5Cr ÷ ₹10 = 15L shares = n

(II) All Equity

ESC = ₹4.5Cr ÷ ₹10

n = 45L Shares

Here we have assumed Share price as ₹10, to help us Calculate number of shares.

Main Solution

Step ① At Indifference Point

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - Int_1)(1-t) - PD}{n_1} = \frac{(EBIT - Int_2)(1-t) - PD}{n_2}$$

$$\frac{(EBIT - 36L)(1-50\%) - 0}{15L} = \frac{(EBIT - 0)(1-50\%) - 0}{45L}$$

Indiff level EBIT = ₹54,00,000.

Step ② Putting on RHS

$$\frac{(54{,}00{,}000 - 0)(1-50\%) - 0}{45L} = ₹0.6$$

↓

Indiff level EPS.

Sol 16 cont'd Required = ₹31,25,000

(A) Equity (i)	(B) Equity & Debt (ii)	(C) Equity & PSC (iii)
ESC = 312,500 x 10 Shares	ESC = 156250 x 10 = 1562500 8% Debt = 1562500	ESC = 156250 x 10 8% PSC = 15,62,500

Main Solution 16 (3)

Indiff Point between Plan (i) & (ii)

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - Int_1)(1-t) - PD_1}{n_1} = \frac{(EBIT - Int_2)(1-t) - PD_2}{n_2}$$

$$\frac{(EBIT - 0)(1-0.40) - 0}{3,12,500} = \frac{(EBIT - 125000)(1-0.40) - 0}{1,56,250}$$

$$(EBIT)(0.6) = 2 \times \frac{[(EBIT - 125000)(0.6)]}{156250}$$

$$(EBIT)(0.6) = 2\,[(EBIT - 125000)(0.6)]$$

$$EBIT = 2EBIT - 250000$$

$$250000 = EBIT$$

Indiff EBIT = ₹2,50,000
Indiff EPS = ₹0.48

Indiff Point between Plan (I) & Plan (II)

$EPS_1 = EPS_2$

$$\frac{(EBIT-0)(1-0.40)-0}{312500} = \frac{(EBIT-0)(1-0.40)-125000}{156250}$$

Indifference level EBIT = ₹ 416667

Indiff level EPS = ₹ 0.80.

Now

$$\frac{(EBIT)(0.6)}{312500} = \frac{(EBIT)(0.6)-125000}{156250}$$

(2) (1)

$$0.6\,EBIT = 2\,[0.6\,EBIT - 125000]$$

$$0.6\,EBIT = 1.2\,EBIT - 250{,}000$$

$$250{,}000 = 1.2\,EBIT - 0.6\,EBIT$$

$$250{,}000 = 0.6\,EBIT$$

$$416667 = EBIT$$

Sol 17 WN ①

Existing situation

ESC = 5,00,000 Shares

Additional Funds

25L

(i) 8% Debentures 25L , (ii) ESC = 2,50,000 × 10 = 25L shares

Main solution

(1) To find level of EBIT at which both plans have same EPS.

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - 2L)(1-50\%) - 0}{5{,}00{,}000} = \frac{(EBIT - 0)(1-50\%) - 0}{7{,}50{,}000}$$

Indifference level EBIT = ₹6,00,000.

To verify (as it's mentioned in question to verify)

	option (i)	option (ii)
EBIT	6,00,000	6,00,000
− Int (25L × 8%)	−2,00,000	−
EBT	4,00,000	6,00,000
− Tax 50%	−2,00,000	−3,00,000
EAES	2,00,000	3,00,000
÷ number of shares	÷ 5,00,000	÷ 7,50,000
EPS	₹ 0.4	₹ 0.4

Hence verified.

Solution 17(2)

For Unlimited EPS.

At Indifference level $UEPS_1 = UEPS_2$

$$\frac{(EBIT - Int_1)(1-t) - PD - \text{(Simplified) } DRR}{n} = \frac{(EBIT - Int_2)(1-t) - PD - \text{(Simplified) } DRR}{n}$$

$$\frac{(EBIT - 2,00,000)(1-50\%) - 0 - 25,000}{5,00,000} = \frac{(EBIT - 0)(1-50\%) - 0 - 0}{7,50,000}$$

Indifference level EBIT = ₹ 21,00,000.

To verify

	Option (i)	Option (ii)
EBIT	₹ 21,00,000	₹ 21,00,000
− Int (25L × 8%)	− ₹ 2,00,000	− 0
EBT	₹ 19,00,000	₹ 21,00,000
− Tax 50%	− ₹ 9,50,000	− ₹ 10,50,000
EAT	₹ 9,50,000	₹ 10,50,000
− Sinking fund	− ₹ 2,50,000	− 0
Unlimited EAES	₹ 7,00,000	₹ 10,50,000
÷ number of shares	÷ 5,00,000	÷ 7,50,000
Unlimited EPS =	₹ 1.4	₹ 1.4

Hence verified

Sol 18 (contd)

New Funds required = ₹60L

Alternative (A)

- All Equity

ESC = 30,000 shares × 200 = ₹60L

→ $\frac{₹60L}{₹200}$

Alternative (B)

- Debt : Equity 2:1
- Debt = $60L \times \frac{2}{3}$ = ₹40L
- ESC = $60L \times \frac{1}{3}$ = ₹20L

Debt @ 18% = ₹40L

ESC = 10,000 share × 200 = ₹20L

→ $\frac{₹20L}{₹200}$

Mathsolution:

⇒ (i) At Indifference level EBIT

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - Int_1)(1-t) - PD_1}{n_1} = \frac{(EBIT - Int_2)(1-t) - PD_2}{n_2}$$

$$\frac{(EBIT - 0)(1 - 40\%) - 0}{30{,}000} = \frac{(EBIT - 7{,}20{,}000)(1 - 40\%) - 0}{10{,}000}$$

$$\frac{(EBIT)(0.6)}{30{,}000_{\;3}} = \frac{(EBIT - 720000)(0.6)}{10{,}000_{\;1}}$$

1 EBIT = 3 (EBIT − 720000)

1 EBIT = 3 EBIT − 21,60,000

21,60,000 = 2 EBIT

₹10,80,000 = EBIT

Indifference level EBIT = ₹10,80,000

Putting on LHS

Indiff level EPS = $\frac{10,80,000\,(1-40\%) - 0}{30,000}$ = **₹21.6**

ICAI's method

For Decision Making

Particulars	If EBIT = 10,70,000		If EBIT = 10,90,000	
	(A)	(B)	(A)	(B)
EBIT	10,70,000	10,70,000	10,90,000	10,90,000
− Int	−0	−7,20,000	−0	−7,20,000
EBT	10,70,000	3,50,000	10,90,000	3,70,000
− Tax 40%	-	−		−
EAT/EAES	6,42,000	2,10,000	6,54,000	2,22,000
÷ No of Shares	÷ 30,000	÷10,000	÷ 30,000	÷10,000
EPS	₹21.4	₹21	21.8	22.2
	Plan (A) is better than Plan (B)		Plan (B) is better than Plan (A).	
	A > B		B > A	

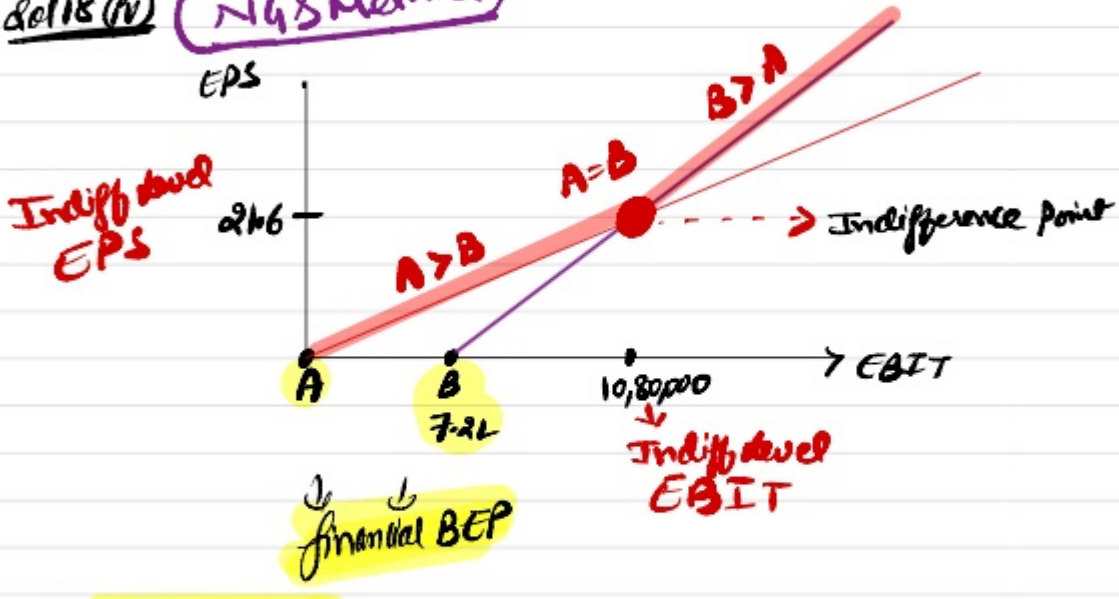
Decision Table:

- If EBIT < 10,80,000, select option A as it has higher EPS
- If EBIT = 10,80,000, select Any Plan, both have same EPS.
- If EBIT > 10,80,000, select option B as it has higher EPS.

Sol 18(iii) **Financial BEP = Int + Pref Div / (1−t)**

Alternative (i) (A)	Alternative (ii) (B)
Financial BEP = 0 + 0/(1−40%) = 0	Financial BEP = 7,20,000 + 0/(1−40%) = ₹ 7,20,000

Sol 18 (iv) **NGS Method**



Decision Table:

- If EBIT < 10,80,000, select option A as it has higher EPS
- If EBIT = 10,80,000, select Any Plan, both have same EPS.
- If EBIT > 10,80,000, select option B as it has higher EPS

Q19

80L

option (I)	option (II)
ESC ⇒ 10 × 6L = 60L	ESC = 10 × 4L = 40L
12% Debt 20L	12% Debt 40L

Step ① Indiff Point

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - I_1)(1-t)}{n_1} = \frac{(EBIT - I_2)(1-t)}{n_2}$$

$$\frac{(EBIT - 240000)(1-30\%)}{6,00,000\ 3} = \frac{(EBIT - 480000)(1-0.3)}{4,00,000\ 2}$$

$$\frac{(EBIT - 2,40,000)(0.7)}{3} = \frac{(EBIT - 480000)(0.7)}{2}$$

$$2(EBIT - 240000) = 3(EBIT - 480000)$$

$$EBIT = 7\,9,60,000$$

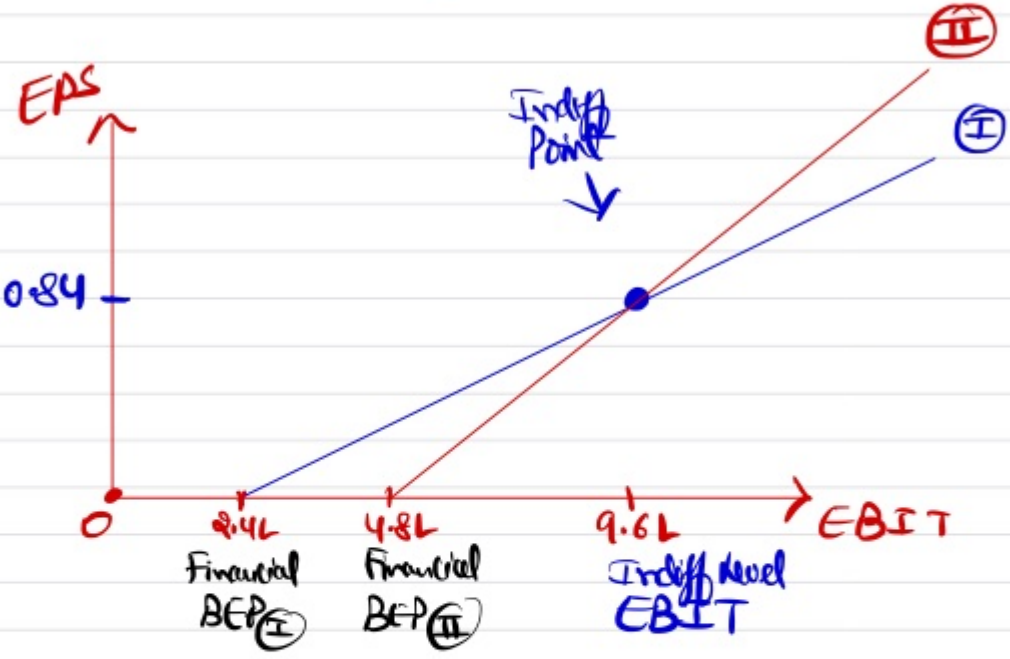
Step ② Indiff level EPS

$$\frac{(9,60,000 - 240000)(1-0.3)}{6,00,000} = \text{Indiff level EPS} = \boxed{0.84}$$

Step ③ Financial BEP

option (I)	option (II)
⇒ Int + Pref div/(1−t) = 2,40,000	= 4,80,000

Indiff level EBIT = ₹9,60,000
Indiff level EPS = ₹0.84
Financial BEP = 2,40,000 × 4,80,000



⇒ Decision Table

If EBIT < ₹9,60,000 → Select option (I) as it provides higher EPS.

⇒ If EBIT = ₹9,60,000 → Select Any option as it provides Equal EPS for both

⇒ If EBIT > ₹9,60,000 → Select option (II) as it provides higher EPS.

Solution

CON(i) **Present Situation**

ESC = 8,00,000 shares × 10 (ass. x) = ₹80 L

10% Debt = ₹36 L

Existing Capital = ₹116 L

Additional Funds Required

₹ 40,00,000

(A)	(B) P Shares	(C) Equity
12% Debt ₹40 L	11% PSC ₹40 L	ESC = 250000 × 16 = ₹40 L

(a) **Statement for Calculation of EPS**

Particulars	(A) Debt Plan	(B) Pref Sh Plan	(C) Equity Plan
EBIT	15,00,000	15,00,000	15,00,000
− Int old	−3,60,000	−3,60,000	−3,60,000
New (40L × 12%)	−4,80,000	×	×
EBT	6,60,000	11,40,000	11,40,000
− Tax 40%	−2,64,000	−4,56,000	−4,56,000
EAT	3,96,000	6,84,000	6,84,000
− Pref Dividend (40L × 11%)	×	− 4,40,000	×
EAES	3,96,000	2,44,000	6,84,000
÷ No of Eq Shares	÷ 8,00,000	÷ 8,00,000	÷ 10,50,000
EPS	0.495	0.305	0.651

(b) As we have three Plan's A, B & C we will have to calculate Indifference Point three times with different Pairs,

A & B

B & C

A & C

→ Indiff Point between A & B

$$EPS_A = EPS_B$$

$$\frac{(EBIT - 840000)(1-0.4) - 0}{8,00,000} = \frac{(EBIT - 360000)(1-0.4) - 440000}{8,00,000}$$

we will not be able to solve this, so, we don't have any Indifference Point between A & B.

→ Indifference point between A & C

$$EPS_A = EPS_C$$

$$\frac{(EBIT - 840000)(1-0.4) - 0}{8,00,000} = \frac{(EBIT - 360000)(1-0.4) - 0}{10,50,000}$$

C ←→ A

Indiff level EBIT = ₹23,76,000

Indiff level EPS = ₹1.152

→ Indifference point between B & C

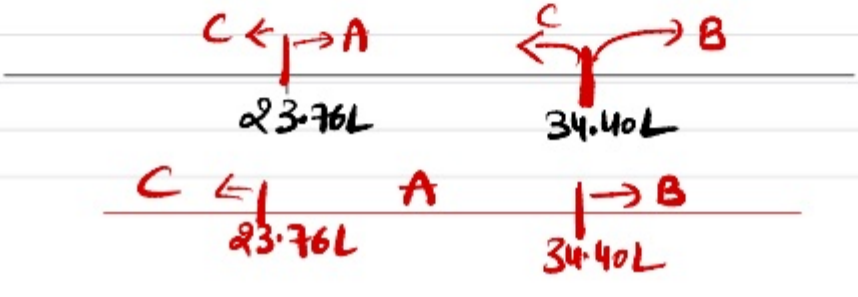
$$EPS_B = EPS_C$$

$$\frac{(EBIT - 360000)(1-0.4) - 440000}{8,00,000} = \frac{(EBIT - 360000)(1-0.4) - 0}{10,50,000}$$

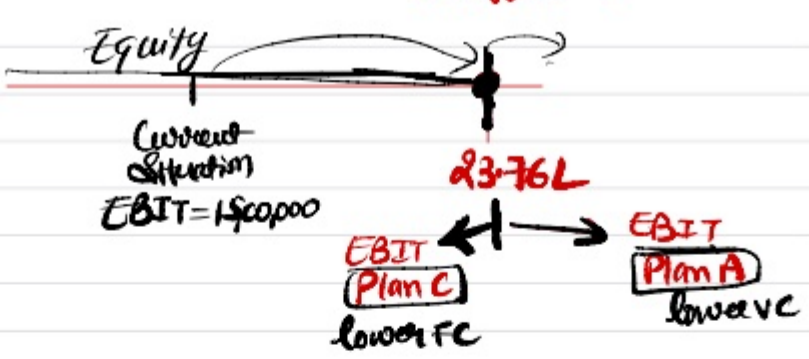
C ←→ B

Indiff level EBIT = ₹34,40,000

Indiff level EPS = ₹1.76



(c)



* At present EBIT = 15,00,000, here Equity plan is best because it provides highest EPS.

* To change this plan, we will have to increase EBIT

  23.76L − 15L = ₹8.76L

If EBIT increases by more than ₹8.76L then decision will change.

Sol 21

Existing Capital

ESC = 20,000 shares × 50 = ₹10L

Additional funds

₹5 lakhs

Equity (i) | Debentures (ii)

ESC = 10,000 shares × 50 = 5L | Int rate = 9%

(5L @ 9%)

Step (1)

$$EPS_1 = EPS_2$$

$$\frac{(EBIT - 0)(1-50\%) - 0}{30,000} = \frac{(EBIT - 45000)(1-50\%) - 0}{20,000}$$

$$\frac{(EBIT)(0.5)}{30,000} = \frac{(EBIT - 45000)(0.5)}{20,000}$$

$$2[(EBIT)(0.5)] = 3[(EBIT - 45000)(0.5)]$$

$$1.\ EBIT = 1.5[EBIT - 45000]$$

$$1\,EBIT = 1.5\,EBIT - 67500$$

$$67500 = 0.5\,EBIT$$

₹ 135000 = Indiff level EBIT

EBIT = ₹5,00,000
Ke = 16%
VD = 20L Int @ 10%

Q of Q2

Step ① Calculate NI (EAES)

EBIT = ₹5,00,000
− Int (20L × 10%) − ₹2,00,000
EAES (NI) = ₹3,00,000

Step ② Calculate VE

$$VE = \frac{EAES\ (NI)}{Ke} = \frac{3,00,000}{16\%} = ₹\ 18,75,000$$

Step ③ Calculate VF, VE + VD = VF

1875000 + 20,00,000 = VF
₹38,75,000 = VF

Step ④ Calculate Ko, $VF = \frac{EBIT}{Ko}$

$$38,75,000 = \frac{5,00,000}{Ko}$$

Ko = 12.9%

(i) Market value of Equity = VE = ₹18,75,000
Market value of firm = VF = ₹38,75,000

(ii) Overall cost of Capital = Ko = 12.9%

Sol 24 EBIT = ₹20m

8% Debt = ₹ 40m

Ke = 17.5% , NI Approach

@ Step① Calculate NI, EBIT = ₹20m

− Int (40×8%) = − ₹3.2m

EAES = NI = 16.8m

Step② Calculate VE, $VE = \frac{NI}{Ke} = \frac{16.8\,m}{17.5\%} = ₹96m$

Step③ Calculate VF.

VF = VE + VD = 96m + 40m = ₹136m

Step④ Calculate Ko

$VF = \frac{EBIT}{Ko}$, $136m = \frac{20m}{Ko}$

So, Ko = 14.7%

@① VF = 136m

Ko = 14.7%

② $\frac{Debt}{Equity} = \frac{40m}{96m} = 0.417:1$ or 41.7%

Sol24(b)

EBIT = ₹20m

8% Debt = 40m + 20m = 60m

Ke = 17.5%

Step① Calculate NI, EBIT = ₹20m

− Int (60 × 8) = −₹4.8m

NI & EAES = 15.2m

Step② Calculate VE, $VE = \frac{EAES}{Ke} = \frac{15.2}{17.5\%} =$ 86.86m

Step③ Calculate VF, VF = VE + VD

= 86.86 + 60

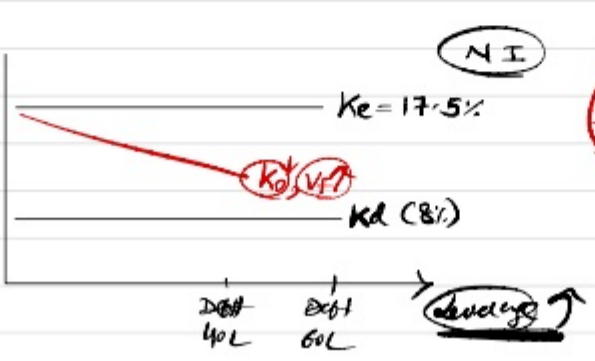
VF = 146.86m

Step④ Calculate Ko, $VF = \frac{EBIT}{Ko}$, $146.86 = \frac{20}{Ko}$

$Ko = 13.62\%$

(b) ① VF = 146.86m, Ko = 13.62%

② $\frac{D}{E} = \frac{60}{8686} =$ 0.69:1



Sol 25 MV of Equity = 1,00,000 (n) × ₹50 = ₹50,00,000 = VE

EBIT = ₹4,00,000

(i)

Step ① EBIT = ₹4,00,000
− Int = 0
EAES = ₹4,00,000

Step ② $VE = \frac{EAES}{Ke}$

$50,00,000 = \frac{4,00,000}{Ke}$

Ke = 8%

Step ③ VF = VD + VE
VF = 0 + 50L
VF = 50L

Step ④ $VF = \frac{EBIT}{Ko}$

$50L = \frac{4,00,000}{Ko}$

Ko = 8%

(ii)

- Debt 6%, 1m
- Ke = 8% (Because in NI approach, Ke is Constant)
- ~~Ko = 8%~~ → (NI approach Ke question mei Ke Constant hoti hai, Jabki Ko Constant nahi hoti hai.)

Step ① Calculate NI, EBIT = 4,00,000
− Int 10L × 6% = − 60,000
EAES = NI = 3,40,000

Step ② $VE = \frac{NI}{Ke} = \frac{3,40,000}{8\%} = ₹42.5L$

Step ③ VF = VD + VE = 10L + 42.5L = 52.5L

Step ④ Calculate Ko, $VF = \frac{EBIT}{Ko}$, $52.5L = \frac{4L}{Ko}$

Ko = 7.62%

Sol 06

EBIT = ₹5,00,000

10% Debt = ₹15,00,000

Ko = 15% ⟶ Isse Anta laga Ki yeh NOI Approach hai.

Step ① $V_F = \frac{EBIT}{K_o} \Rightarrow V_F = \frac{500000}{15\%} = ₹33,33,333$

Step ② $V_F = V_D + V_E$

$33,33,333 = 15,00,000 + V_E$

So, $V_E = ₹18,33,333$ ✓

Step ③ EBIT = ₹5,00,000

− Int 15L × 10% = −₹1,50,000

EAES = ₹3,50,000 ✓

Step ④ $V_E = \frac{EAES}{K_e}$

$18,33,333 = \frac{3,50,000}{K_e}$

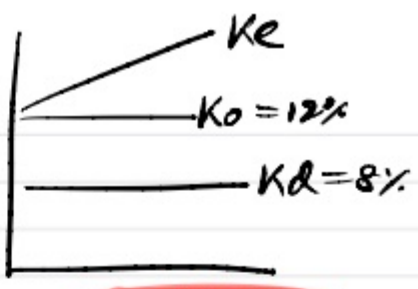
So $K_e = 19.09\%$

Solⁿ

EBIT = ₹20m

8% Debt = ₹40m.

Ko = 12%



(a)

Step① Calculate VF, $VF = \frac{EBIT}{Ko} = \frac{20m}{12\%} = ₹166.67m$

Step② Calculate VE, $VF = V_E + V_D$

$166.67 = VE + 40m$

$126.67 = VE$

Calculate NI

Step③ EBIT = 20m

− Int (40m × 8%) = −3.2m

NI = 16.8m

Step④ Calculate Ke, $VE = \frac{EAES}{Ke}$

$126.67 = \frac{16.8}{Ke}$

$Ke = 13.27\%$

(a)① VF = ₹166.67m, Ke = 13.27%

VE = ₹126.67m

(a)② $\frac{D}{E} = \frac{40m}{126.67m} =$ 0.3158 : 1 & 31.58%

Sol 28 (b) EBIT = ₹20m

8% Debt = 40m + 20m = 60m

Ko = (Same) = 12%. → In NOI approach Ko is Constant.

~~Ke~~

Step ① $V_F = \frac{EBIT}{Ko} \Rightarrow V_F = \frac{20m}{12\%} = ₹166.67m$

Step ② $V_F = V_D + V_E$

$166.67 = 60m + V_E$

$V_E = 106.67m$

Step ③ EBIT = 20m

− Int (60m × 8%) − 4.8m

EAES = NI = 15.2m.

Step ④ $V_E = \frac{EAES}{Ke} \Rightarrow 106.67 = \frac{15.2}{Ke}$

$Ke = 14.25\%$

(b) ① $V_F = 166.67m$

$Ke = 14.25\%$

(b) ② $\frac{D}{E} = \frac{60m}{106.67} = 0.5628:1$ & 56.28%

Sol 29

Alpha Ltd.

Debt = 50%
Equity = 50%
Int rate = 8%

EBIT = ₹3,60,000
Ko = 18%

Solving by NOI approach.

Step ① $V = \frac{EBIT}{Ko} = \frac{3,60,000}{18\%}$

$V = ₹20,00,000$

Step ② $V = VE + VD$

$20,00,000 = 50\% + 50\%$

So, $VE = 20,00,000 \times 50\% = ₹10,00,000$

$VD = 20,00,000 \times 50\% = ₹10,00,000$

Step ③ EBIT = 3,60,000
− Interest 10L × 8% = −80,000
EAES = NI = 2,80,000

Step ④ $VE = \frac{EAES}{Ke}$

$10,00,000 = \frac{2,80,000}{Ke}$

Ke = 28%

⇒ If you own 2% of company

Beta Ltd.

Debt = 20%
Equity = 80%
Int rate = 8%

EBIT = ₹3,60,000.
Ko = 18%

Solving by NOI approach.

Step ① $V = \frac{EBIT}{Ko} = \frac{3,60,000}{18\%}$

$V = ₹20,00,000$

Step ② $V = VE + VD$

$80\% \quad 20\%$

$VE = 20,00,000 \times 80\% = ₹16,00,000$

$VD = 20,00,000 \times 20\% = ₹4,00,000$

Step ③ EBIT = 3,60,000
− Int 4L × 8% = − 32000
EAES = NI = 3,28,000

Step ④ $VE = \frac{EAES}{Ke}$

$16,00,000 = \frac{3,28,000}{Ke}$

Ke = 20.5%

If you own 2% of company

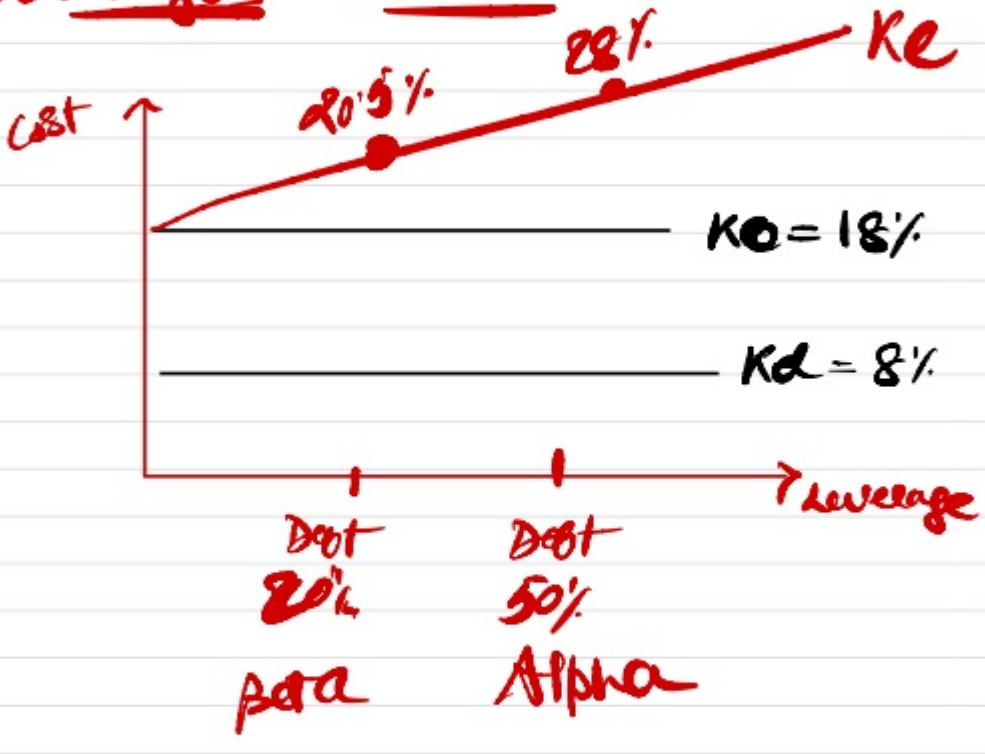
Amount of Income (₹2,80,000 x 2%) = ₹5600

Implied rate of return = Ke = 28%

Amount of Income 3,28,000 x 2% = ₹6560

Implied rate of return = Ke = 20.5%

(ii) Analysis → NOI



Q30

Present Situation	Alternative ①	Alternative ②
Debt 0	Debt = 20L × 30% = 6L	Debt = 20L × 50% = 10L
Kd = –	Kd = 10%	Kd = 12%
Ke = 16%	Ke = 17%	Ke = 20%
EBIT = 3,00,000	EBIT = 3,00,000	EBIT = 3,00,000
Step① EBIT = 3,00,000	EBIT = 3,00,000	EBIT = 3,00,000
– Int = 0	– Int 6L × 10% = –60,000	– Int 10L × 12% = –1,20,000
NI = 3,00,000	NI = 2,40,000	NI = 1,80,000
Step② $VE = \frac{NI}{Ke}$		
$VE = \frac{3,00,000}{16\%}$	$VE = \frac{2,40,000}{17\%}$	$VE = \frac{1,80,000}{20\%}$
VE = 18.75L	VE = ₹14,11,765	VE = ₹9,00,000
Step③ VF = VD + VE	VE + VD	
VF = 18.75L + 0	VF = 1411765 + 6,00,000	VF = 9L + 10L
VF = 18.75L	VF = 20,11,765	VF = 19L
Step④ $VF = \frac{EBIT}{Ko}$		
$18.75 = \frac{3L}{Ko}$	$2011765 = \frac{3,00,000}{Ko}$	$19,00,000 = \frac{3,00,000}{Ko}$
Ko = 16%	Ko = 14.91%	Ko = 15.79%

Q22 to 28
Q30

Sol 31

	Kee Ltd (Unlevered)	Lee Ltd. (levered)
12% Debt	—	₹20,00,000
Tax	30%	30%
EBIT	₹5,00,000	₹5,00,000
Ke	25%	

Main Solution — Unlevered Co. (Kee Ltd)

Step① EBIT = 5,00,000
− Int = 0
EBT = 5,00,000
− Tax 30% = −1,50,000
EAES = 3,50,000

Step② $V_E = \frac{EAES}{Ke}$
$= \frac{3,50,000}{25\%}$
V_E = ₹14,00,000

Step③ $V_F = V_E + V_D$
$V_F = 14,00,000 + 0$

Value of unlevered firm (Kee Ltd) = ₹14,00,000.

Using MM with Tax

Value of levered firm = Value of unlevered firm + Debt × tax rate

$= 14,00,000 + 20,00,000 \times 30\%$

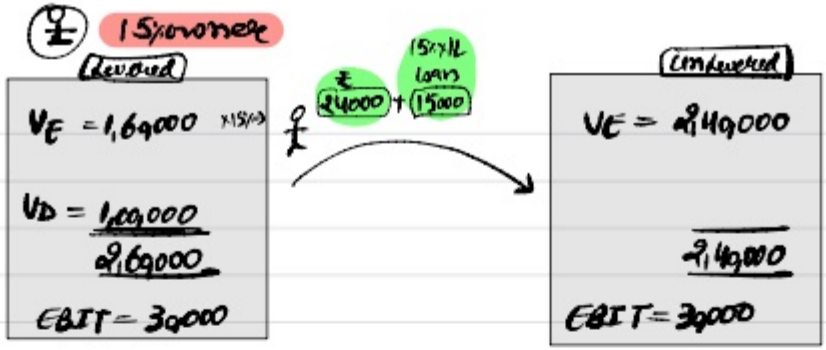
Value of levered firm (Lee Ltd) = ₹20,00,000

Sol 32:

	Rd+d (levered)	Std. (unlevered)
EBIT	₹ 10,00,000	₹10,00,000
Esc	170,000 x 10 = ₹17,00,000	50,000 x 10 = ₹5,00,000
10% Debt	₹3,30,000	—
Ke	18%	15%

Step① EBIT	10,00,000	10,00,000
− Int	− 3,30,000	− 0
EAES	6,70,000	10,00,000
Step② VE = EAES / Ke	6,70,000 / 18%	10,00,000 / 15%
VE =	₹ 37,22,222	₹66,66,667
Step③ VF = VE + VD		
VF =	3722,222 + 330,000	₹66,66,667 + 0
VF =	₹ 7,022,222	₹66,66,667.

Sol 34



WN ②

Levered Co.

Step ① EBIT = ₹30,000
− Int 1,00,000 × 10% = −₹10,000
EAES = ₹20,000

Step ② $V_E = \frac{EAES}{Ke} = \frac{20,000}{12.5\%}$
V_E = ₹1,60,000

Step ③ $V_F = V_E + V_D$
$V_F = 1,60,000 + 1,00,000$
V_F = ₹2,60,000

Extra Step $ROI = \frac{EBIT}{CE}$
$= \frac{30,000}{2,60,000} \times 100 = 11.54\%$

Unlevered Co.

Step ① EBIT = ₹30,000
− Int −
EAES = ₹30,000

Step ② $V_E = \frac{30,000}{12.5\%}$
V_E = ₹2,40,000

Step ③ $V_F = V_E + V_D$
$V_F = 2,40,000 + 0$
V_F = 2,40,000

$= \frac{30,000}{2,40,000} \times 100 = 12.5\%$

Arbitrage Process

Step ① Calculation of **original Investment** & **original Earnings.**

Original Investment = Equity × 15%

- Equity = 160,000 × 15% = ₹24,000

Original Earning = EAES × 15%

= 20,000 × 15% = ₹3000

Amount available for Investment

Equity Sold = ₹24,000

Debt Raised = ₹15,000

(₹1,60,000 × 15%) ₹39,000

Step ② Now Invest amount in Undervalued Co.

Value of firm = ₹2,46,000 ; Investment = ₹39,000

% of Share purchased in undervalued Co = $\frac{₹39000}{₹2,46000} \times 100 = 16.25\%$

Step ③ Earning from New Investment

Earning from Equity = 39000 × 16.25% = ₹4875
EAES

− Int Paid on Borrowed funds.

15000 × 10% (rate of Int) = −₹1500

Net New Earning = ₹3375

Impact of Arbitrage

Increase in Earning = (3375 − 3000) = ₹375.

Sol 35

WN 8

Sanghmani Ltd (levered) | Samsui Ltd (Unlevered)

1/3 Debt — Interest = 10%

2/3 Equity — Ke = ?

Ke = 16%

As per MM approach (without tax), Ko is constant

Thus Ko of levered Co = Ko of unlevered Co.

$$Ke \times \frac{E}{D+E} + Kd \times \frac{D}{D+E} = Ke \times \frac{E}{E}$$

$$Ke \times \frac{2}{3} + 10\% \times \frac{1}{3} = 16\% \times 1$$

$$\frac{2 \times Ke + 10\%}{3} = 16\%$$

$$2 \times Ke + 10\% = 48\%$$

$$Ke = \frac{38\%}{2} = 19\%$$

Q136

I (15%) Undevered

V_E = 2,40,000

V_D = 0

Low ROI 12.5%

15% Equity ₹36000

V_E = 1,00,000

V_D = 1,00,000

Higher ROI = 15%

WN(1) As Ke is given we will use steps of NI approach.

	Undevered Co.	Levered Co.
Step(1)	EBIT = 30,000 − Int = − 0 EAES = 30,000	EBIT = 30,000 Int = 10,000 EAES = 20,000
Step(2)	$V_E = \frac{EAES}{Ke} = \frac{30000}{12.5\%}$ V_E = 2,40,000	$V_E = \frac{20,000}{20\%} = 1,00,000$ V_E = 1,00,000
Step(3)	$V_F = V_E + V_D$ = 2,40,000 + 0 V_F = 2,40,000	V_F = 1,00,000 (Ve) + 1,00,000 (Vd) V_F = 2,00,000
Extra step	ROI = $\frac{30000}{2,40,000} \times 100$ ROI = 12.5%	ROI = $\frac{30,000}{2,00,000} \times 100$ ROI = 15%

Lower → Higher

Step ① Calculate original Investment & original Income

Amt of Investment sold = ₹240,000 × 15% = ₹36000

original Income = EAES × 15%
= 300000 × 15% = ₹4500

Step ② Amount available for Investment = ₹36,000
(₹240,000 × 15%)

Value of Target company = ₹200,000.

% of desired company acquired = $\frac{36000}{200000} \times 100$ = 18%

It means you will invest in 18% Equity & 18% of Debt.
(yani aap ₹18000 ki equity buy kaloge and ₹18000 ki Debt buy kaloge.)

Step ③ Earning from New Investment

- Equity earning EAES × 18% = 200,000 × 18% = 3600
- Debt earning Interest × 18% = 10,000 × 18% = 1800

New Total Earning = ₹5400

Thus we can say that Investor has arbitrage gain

- Earning increased by ₹900 (₹5400 − ₹4500) (New − old)
- Investment is constant at ₹36,000.

Sd37

	Bee dtd	Cee dtd
12% Debt	₹27,00,000	-
EBIT	₹ 9,00,000	₹9,00,000
Ke	?	Ke = 18%

(i) No Tax (MM)

Step①

EBIT =	9,00,000	9,00,000
− Int =	−3,24,000	−
EAES =	5,76,000	9,00,000

Step②

$V_E = \frac{EAES}{Ke} = \frac{9,00,000}{18\%}$

$V_E = 50,00,000$

Step③

$V_E + V_D = V_F$

$50L + 0 = V_F$

$V_F = ₹50,00,000$

Step④

$V_F = \frac{EBIT}{K_O}$

$50L = \frac{9,00,000}{K_O}$

$K_O = 18\%$

As per MM approach without Tax, K_O is constant

So, K_O for Bee dtd = K_O for Cee dtd

K_O for Bee dtd = 18%

$\Rightarrow$ V_F for Bee dtd = $\frac{EBIT}{K_O} = \frac{9,00,000}{18\%} = ₹50,00,000$

$\Rightarrow$ $V_F = V_D + V_E$

$50L = 27L + V_E$

So, VE for Bee Ltd = 23L

$$\Rightarrow \quad VE = \frac{EAES}{Ke}$$

$$23{,}00{,}000 = \frac{5{,}76{,}000}{Ke}, \quad Ke = 25.04\%$$

(i)

	Bee Ltd	Cee Ltd
Total Market Value VF	₹50,00,000	₹50,00,000
Equity Capitalization rate (Ke)	25.04%	18%
Weighted Average cost of Capital (Ko)	18%	18%

(ii) MM approach with Tax.

	Bee Ltd	Cee Ltd
Step① EBIT	9,00,000	9,00,000
− Int	−3,24,000	− 0
EBT	5,76,000	9,00,000
− Tax	−230,400	− 3,60,000
EAT & EAES	3,45,600	5,40,000

Step②

$$VE = \frac{EAES}{Ke} = \frac{5{,}40{,}000}{18\%}$$

VE = ₹30,00,000

Step(3)

$V_E + V_D = V_F$

$30L + 0 = V_F$

V_F (unlevered) $= 30L$

Step(4)

$V_F = \frac{EBIT}{K_O}$

$30L = \frac{9L}{K_O}$

$K_O = 30\%$

⇒ As per MM with Tax

$V_{levered\ firm} = V_{unlevered\ firm} + Debt \times tax\ rate$

$V_{Leveraged} = V_{Unleveraged} + 27L \times 40\%$

$V_{Leveraged} = 30,00,000 + 10,80,000$

$V_{Leveraged} = ₹\ 40,80,000$

⇒ $V_F = \frac{EBIT}{K_O}$

$40,80,000 = \frac{9,00,000}{K_O}$

$K_O = 22.05\%$

VF Bee Ltd = 40,80,000

- Debt 27,00,000
- Equity 13,80,000 (B/S)

$Kd = I(1-t) = 12\%(1-40\%) = 7.2\%$

$Ko = 22.05\%$

Another way of Calculating Ko

$$Ko = Ke \times \frac{E}{D+E} + Kd \times \frac{D}{D+E}$$

$$= 25.04\% \times \frac{13.8}{40.8} + 7.2\% \times \frac{27}{40.8}$$

Ko =

$$VE = \frac{EAES}{Ke}$$

$$13,80,000 = \frac{3,45,600}{Ke}$$

$$Ke = \frac{3,45,600}{13,80,000}$$

$Ke = 25.04\%$

	Bee Ltd	Cee Ltd
Total Market value VF	₹40,80,000	₹30,00,000
Equity Capitalization rate (Ke)	25.04%	18%
Weighted Average cost of capital (Ko)	22.05%	30%

Sol 39 (a) MM with Tax (40% Corporate Tax)

(a) (i) No leverage (No Debt)

Step ①

EBIT	= 30,00,000
− Int	= 0
EBT	= 30,00,000
− Tax 40%	= 12,00,000
EAES/EAT	= 18,00,000

Step ②

$V_E = \frac{EAES}{K_e} = \frac{18,00,000}{18\%} = 100,00,000$

$V_E = ₹1,00L$

Step ③ $V_F = V_E + V_D$

$= 100L + 0$

$V_F = ₹100L$

---

a(ii) If firm has Debt of ₹40L

Value of levered firm = Value of unlevered firm + Debt × Tax rate

$= ₹100L + 40L \times 40\%$

$V_{LF} = ₹116L$

---

a(iii) If firm has 70L

$V_{LF} = 100L + 70L \times 40\%$

$V_{LF} = ₹128L$

Sol 39(b)

- Corporate Tax rate = 40% = T
- Personal Tax on Equity = 25% = P_e
- Personal Tax on Debt = 30% = P_d

(b)(i) unlevered = ₹100L (Same as (a)(i))

(b)(ii) If Debt = 40L

$$V_L = V_{UL} + \text{Debt}\left[1 - \frac{(1-t)(1-R)}{(P-Rd)}\right]$$

$$= 100L + 40L\left[1 - \frac{(1-40\%)(1-25\%)}{(1-30\%)}\right]$$

$$= 100L + 40L\left(1 - \frac{0.6 \times 0.75}{0.7}\right)$$

$$= 100L + 40L \times 0.35714 = \text{₹}114.2856L$$

(b)(iii) If Debt = 70L

$$V_L = V_{UL} + \text{Debt}\left[1 - \frac{(1-t)(1-R)}{(P-Rd)}\right]$$

$$= 100L + 70L\left[1 - \frac{(1-40\%)(1-25\%)}{(1-30\%)}\right]$$

$$= 100L + 70L\left(1 - \frac{0.6 \times 0.75}{0.7}\right)$$

$$= 100L + 70L \times 0.35714 = \text{₹}125L$$

Sol 38 (MM with Tax)

	UMA Ltd (unlevered)	LATA Ltd (levered)
Debt	0	15% Debt ₹6,00,000
EBIT	₹2,00,000	₹2,00,000
	Ke = 20%	

Step A Calculate value of unlevered firm (UMA Ltd)

Step 1
EBIT = 2,00,000
− Int = − 0
EBT = 2,00,000
− Tax × 35% = − 70,000
EAES = ₹1,30,000

Step 2
$VE = \frac{EAES}{Ke}$
$= \frac{1,30,000}{20\%}$
VE = ₹6,50,000

Step 3 VF = VE + VD
VF = 6,50,000 + 0
VF = 6,50,000 (UMA)

$Ko = Ke \times \frac{E}{D+E} + Kd \times \frac{D}{D+E} = 20\% \times \frac{6.5}{6.5+0} + Kd \times \frac{0}{6.5+0} = 20\%$ (UMA)

or

$VF = \frac{EBIT}{Ko}(1-t)$ ← If we have Tax this formulae should use tax.

$6,50,000 = \frac{2,00,000(1-35\%)}{Ko}$

$Ko = \frac{1,30,000}{6,50,000} = 20\%$

Step ② Calculating Value of Data Ltd (Levered)

As per MM with Tax

Value of levered firm = Value of unlevered firm + Debt × tax rate

$V_{data} = V_{uma} + Debt \times t$

$= 6,50,000 + 6,00,000 \times 35\%$

Value of data = ₹ 8,60,000.

$V_F = \frac{EBIT(1-t)}{K_o}$

$8,60,000 = \frac{2,00,000\,(1-35\%)}{K_o}$

$K_o = 15.12\%$

or

$K_o = K_{ex}\frac{E}{D+E} + K_d \times \frac{D}{D+E}$

$V_F = 8,60,000$

Equity 2,60,000 V_E | Debt 6,00,000 V_D

$K_o = 27.5\% \times \frac{2,60,000}{8,60,000} + 15\%(1-35\%) \times \frac{6,00,000}{8,60,000}$

↓ from Con (2)

$K_o = 15.12\%$

WON (2)

EBIT	= 2,00,000
− Int (6L × 15%)	= 90,000
EBT	= 1,10,000
− Tax 35%	= −38500
EAES	= 71500

, VE = 2,60,000 , Ke = ?

$$VE = \frac{EAES}{Ke}$$

$$2,60,000 = \frac{71500}{Ke}$$

Ke = 27.5%

Qd 41 $\frac{D}{E} = \frac{0.8}{1}$, Kd = 9%, Ko = 12%

$$Ko = Ke \times \frac{E}{D+E} + Kd \times \frac{D}{D+E}$$

$$12\% = Ke \times \frac{1}{1.8} + 9\% \times \frac{0.8}{1.8}$$

$$12\% = \frac{1 \cdot Ke + 7.2\%}{1.8}$$

Ke = 14.4%

Sol 40 (i)

	A	B
EBIT	₹15,00,000	₹15,00,000
	All Equity Unlevered.	11% Debt 7,00,000 Levered.
Tax	25%	25%

→ Earning available for equity & Debt ?

Sol:

	A	B
EBIT	15,00,000	15,00,000
− Interest	0	−77,000
EBT	15,00,000	14,23,000
− Tax × 25%	−3,75,000	−3,55,750
EAES	11,25,000	10,67,250

So, Earnings available to Debt: 0 | ₹77000

Earning available to Equity Shares: ₹11,25,000 | ₹10,67,250.

Sol 42

All Equity (Unlevered)

V_F = ₹2,50,000

K_e = 20%

Future

15% Debt raise = 5,00,000

(i)

Value of levered firm = Value of unlevered firm + Debt × t

= ₹2,50,000 + 5,00,000 × 30%

(given)

Value of levered firm = ₹26.5L

Market value of RES after capital restructuring = ₹26.5L

(ii)

Unlevered

EBIT =	7,50,000
− Int =	0
EBT	7,50,000 (100%)
− Tax 30%	− 2,25,000
EAES =	5,25,000 (70%)

$\Rightarrow V_F = V_D + V_E$

$25L = D + V_E$

$V_E = 25L$

$\Rightarrow V_E = \frac{EAES}{K_e}$

$25L = \frac{EAES}{21\%}$

₹5,25,000 = EAES

con(ii) Levered firm

EBIT =	7,50,000
− Int 5L × 15% =	− 75000
EBT =	6,75,000
− Tax 30%	− 2,02,500
EAT + EAES =	4,72,500

V_F = 26.5L → Debt = 5,00,000; Equity = 21,50,000

$V_E = \frac{EAES}{K_e}$

$21,50,000 = \frac{4,72,500}{K_e}$

K_e = 22% (approx)

(ii) Ke for a levered firm (after restructuring) = 22%

(iii) $WACC = Ko = Ke \times \frac{E}{D+E} + Kd \times \frac{D}{D+E}$

$= 22\% \times \frac{21.5L}{26.5L} + 15\%(1-30\%) \times \frac{5L}{26.5L}$

Ko = 19.8%

Comment: Thus Ko has reduced after capital restructuring

(original Ko (Unlevered) = 21%
New Ko (levered) = 19.8%)

Alternative method

$$VF = \frac{EBIT(1-t)}{Ko}$$

$$26.5L = \frac{7.5L(1-30\%)}{Ko}$$

$$Ko = \frac{5.25L}{26.5L} \times 100 = 19.81\%$$

Sol 43 (i)

Using Traditional Approach

V_D	$K_d = I/P$	V_E	K_e	$K_o = K_d \times \frac{D}{D+E} + K_e \times \frac{E}{D+E}$
0	-	50L	10%	K_o = 10%
5L	6%	44.76L	10.5%	$K_o = 6\% \times \frac{5}{49.76} + 10.5\% \times \frac{44.76}{49.76}$ =
10L	6%	40L	11%	$K_o = 6\% \times \frac{10}{50} + 11\% \times \frac{40}{50}$ =
15L	6.2%		11.30%	
20L	7%		12.40%	
25L	7.5%		13.50%	
30L	8.0%		16.00%	

WON (i)

(i)

EBIT = 50,000

- Int = 0

EAES = 50,000

$V_E = \frac{EAES}{K_e} = \frac{50,000}{10\%}$

V_E = 50L

(ii)

EBIT = 50,000

Int (5L × 6%) = 30,000

EAES = 47,000

$V_E = \frac{47000}{10.5\%}$

V_E = 4476190

V_E = 44.76L

(iii)

EBIT = 50,000

- Int 10L × 6% = -60,000

EAES = 44,0000

$V_E = \frac{4,40000}{11\%}$

V_E = 40L

HW → Solve for all parts & find lowest K_O

Sol 43(ii) MM (without Tax) is followed.

It means Ko will be constant, VF will be constant.

$$Ke = Ko + \frac{D}{E}(Ko - Kd)$$

V_D	Kd	V_E	Ko	Ke
0	-	50L	10%	$Ke = 10\% + -- = 10\%$
5L	6%	45L	10%	$Ke = 10\% + \frac{5}{45}(10\% - 6\%) = 10.44\%$
10L	6%	40L	10%	$Ke = 10\% + \frac{10}{40}(10\% - 6\%) = 11\%$
15L	6.2%	35L	10%	$Ke = 10\% + \frac{15}{35}(10\% - 6.2\%) = 11.63\%$
20L	7%	30L	10%	$Ke = 10\% + \frac{20}{30}(10\% - 7\%) = 12\%$
25L	7.5%	25L	10%	$Ke = 10\% + \frac{25}{25}(10\% - 7.5\%) = 12.5\%$
30L	8%	20L	10%	$Ke = 10\% + \frac{30}{20}(10\% - 8\%) = 13\%$

Sol (44)

Statement for estimation of K_o

options	wd	we	Kd	Ke	$K_o = wd \times Kd + we \times Ke$
1	0	1	11%	13%	$K_o = 0 \times 11\% + 1 \times 13\% =$ 13%
2	0.1	0.9	11%	13%	$K_o = 0.1 \times 11\% + 0.9 \times 13\% =$ 12.8%
3	0.2	0.8	11.6%	14%	$K_o = 0.2 \times 11.6\% + 0.8 \times 14\% =$ 13.52%
4	0.3	0.7	12%	15%	$K_o = 0.3 \times 12\% + 0.7 \times 15\% =$ 14.1%
5	0.4	0.6	13%	16%	$K_o = 0.4 \times 13\% + 0.6 \times 16\% =$ 14.8%
6	0.5	0.5	15%	18%	$K_o = 0.5 \times 15\% + 0.5 \times 18\% =$ 16.5%
7	0.6	0.4	18%	20%	$K_o = 0.6 \times 18\% + 0.4 \times 20\% =$ 18.8%

Sol 46 If $K_o = 9.09\%$, then firms value is in Equilibrium.

	A	B
EBIT	₹5000	₹5000
− Int	0	₹1800
EBT & EAES	₹5000	₹ 3200

If we use $K_o = 9.09\%$

$$V_F(A) = \frac{EBIT}{K_o} = \frac{5000}{9.09\%}$$

$V_F(A) = ₹55005.50$

$$V_F(B) = \frac{EBIT}{K_o} = \frac{₹5000}{9.09\%}$$

$V_F(B) = ₹55005.50$

So, value of both firms at Equilibrium shall be ₹ 55005.50.

(ii)

	A	B
V_F =	₹55005.50	₹55005.50
− V_D =	− 0	− 30000
V_E =	₹55005.50	₹25005.50
EAES =	₹5000	₹3200

$V_E = \frac{EAES}{K_e}$, so $K_e = \frac{EAES}{V_E}$

$$K_{e_A} = \frac{₹5000}{55005.50} \times 100$$

$K_{e_A} = 9.09\%$

$$K_{e_B} = \frac{₹3200}{25005.50}$$

$K_{e_B} = 12.8\%$

Sol 49

Wkg ① Current Capital.

ESC = 20,000 Shares × ₹100 = ₹20,00,000
RES = — ₹10,00,000
10% Long term Debt = ₹15,00,000

Existing Capital = ₹45,00,000 (Total Capital ₹55,00,000)
Additional funds Req = ₹10,00,000

Alternative ①

80% by 14% Debt = ₹8,00,000
20% by Equity = ₹2,00,000
÷ 133.33 Issue Price
Number of New ES = 1500 Shares. New

Alternative ②

10% by 8% Irredeemable Debt = ₹1,00,000
90% by Equity = ₹9,00,000
÷ 125 (Issue Price)
Number of New ES = 7200

Wkg ② Calculating D/E ratio

Alternative ①

$\frac{D}{D+E} = \frac{15L+8L}{55L} = 41.82\%$

41.82% > 35% Prop!!!

P/E ratio = 7 Times

Alternative ②

$\frac{D}{D+E} = \frac{15L+1L}{55L} = 29.09\%$

29.09% < 35%
No Prop!!!

P/E ratio = 8.5

Wkg ③

EBIT = ? 7,10,000
− Int (15L × 10%) = −1,50,000
EBT = 5,60,000
− Tax 25% = − 1,40,000
EAES = 4,20,000
÷ n ÷ 20,000
EPS = ₹21

100% − 25% = 75%

Working Reverse Calculation

EAES = 21 × 20,000 = 4,20,000
4,20,000 / 75 × 100 = 5,60,000 EBT

(or)

$$EPS = \frac{(EBIT - Int)(1-t) - PD}{n}$$

$$21 = \frac{(EBIT - 150000)(1-25\%) - 0}{20,000}$$

$$21 \times 20,000 = (EBIT - 150000)(0.75) - 0$$

So, Current level of EBIT = ₹ 7,10,000
+ Additional EBIT = ₹ 2,00,000

Need Total EBIT = ₹ 9,10,000

Main Solution

Sol 49 (i) Statement for Calculation of EPS & MPS

Particulars	Alternative (i)	Alternative (ii)
EBIT (New)	₹ 9,10,000	₹ 9,10,000
− Interest		
old (15L × 10%)	− 1,50,000	− 1,50,000
New (8L × 14%)	− 1,12,000	(1L × 8%) − ₹ 8000
EBT	₹ 6,48,000	₹ 7,52,000
− Tax 25%	− ₹ 1,62,000	− ₹ 1,88,000
PAT & EAES	₹ 4,86,000	₹ 5,64,000
÷ Number of Eq. Shares	(20,000 + 1500) ÷ 21500	(20,000 + 7200) ÷ 27200
EPS	22.60	20.74
× P/E ratio	× 7	× 8.5
MPS	₹ 158.2	₹ 176.29

Advice: (i) on basis of EPS → Alternative (i) is better
on basis of MPS → Alternative (ii) is better.

Sol 49 (ii)

Calculation of financial leverage = $\frac{EBIT}{EBIT - Int - \frac{PD}{(1-t)}}$

Financial leverage = $\frac{EBIT}{EBT}$

	Alternative ①	Alternative ②
Financial leverage =	9,10,000 / 6,48,000	9,10,000 / 7,52,000
Financial leverage =	1.40	1.21

Advice: Financial leverage represents financial risk. So we should select Alternative ② because it has lower financial leverage.

Sol 49 (iii) Calculation of WACC

Alternative ①

Particulars	Amt	weight	Rate	WACC
(ESC & RDS)	20L + 10L + 2L = 32L	32/55	19.43%	
Debt1	15L	15/55	7.5%	
Debt2	8L	8/55	10.95%	
	55			WACC1

Alternative ②

Particulars	Amt	weight	Rate	WACC
(ESC & RDS)	20L + 10L + 9L = 39L	39/55	17.76%	
Debt1	15L	15/55	7.5%	
Debt3	1L	1/55	6%	
				WACC2

Calculation of WMCC

Alternative ①

Particulars	Amt	weight	Rate	WMCC
Equity (Est Rs)	2L	0.2	19.43%	
Debt 2	8L	0.8	10.95%	
	10L			

$WMCC_1 =$

Alternative ②

Particulars	Amt	weight	Rate	WMCC
Equity	9L	0.9	17.76%	
Debt 3	1L	0.1	6%	
	10L			

$WMCC_2 =$

WN ④

Calculation of $Ke = \frac{D_1}{P_0} + g$

Alternative ①

$$Ke = \frac{(22.6 \times 60\%)(1+10\%)}{158.2} + 10\%$$

(DPS0 = EPS × 60%)

Ke = 19.43%

Alternative ②

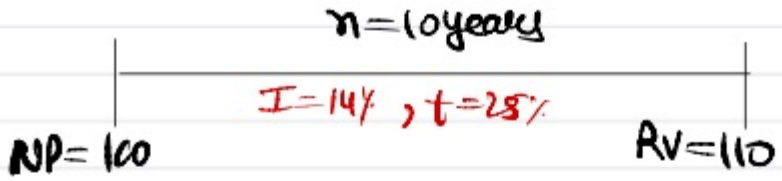
$$Ke = \frac{(20.74 \times 60\%)(1+10\%)}{176.29} + 10\%$$

Ke = 17.76%

WN ⑤ old Debt **Kd₁**

$$Kd_1 = I(1-t) = 10\%(1-25\%) = 7.5\%$$

WN⑥ (Debt 2) (Alternative ①)



$$Kd_2 = \frac{I(1-t) + \left(\frac{RV-NP}{n}\right)}{\left(\frac{RV+NP}{2}\right)} = \frac{14(1-25\%) + \left(\frac{110-100}{10}\right)}{\left(\frac{110+100}{2}\right)}$$

$$\boxed{Kd_2 = 10.95\%}$$

WN⑦ Kd_3 (Alternative ②)

$$Kd_3 = I(1-t) = 8\%(1-25\%) = 6\%$$

Capital Structure

Solution 1:

Computation of level of earnings before interest and tax (EBIT)

In case alternative (i) is accepted, then the EPS of the firm would be:

EPS Alternative (i) = $\frac{(EBIT - Interest)\ (1 - tax\ rate)}{No.\ of\ Equity\ Shares} = \frac{(EBIT - 0.14\ x\ 8{,}00{,}000)\ (1 - 0.3)}{1{,}20{,}000\ shares}$

In case the alternative (ii) is accepted, then the EPS of the firm would be

EPS Alternative (ii) = $\frac{(EBIT - Interest)\ (1 - Tax\ Rate) - PD}{No.\ of\ Equity\ Shares}$

= $\frac{(EBIT - 0.14\ x\ 8{,}00{,}000)\ (1 - 0.3)}{80{,}000\ shares}$ – 0.16 x 4,00,000

In order to determine the indifference level of EBIT, the EPS under the two alternative plans should be equated as follows:

$\frac{(EBIT - 0.14\ x\ 8{,}00{,}000)(1 - 0.3)}{1{,}20{,}000\ shares}$ = $\frac{(EBIT - 0.14\ x\ 8{,}00{,}000)(1 - 0.3)}{80{,}000\ shares}$ – 0.16 x 4,00,000

Or, $\frac{0.7\ EBIT - 78{,}400}{1{,}20{,}000}$ = $\frac{0.7\ EBIT - 1{,}42{,}400}{80{,}000}$

Or 1.40 EBIT – ₹1,56,800 = 2.10 EBIT – ₹ 4,27,200

Or 0.70 EBIT = ₹ 2,70,400

Or, EBIT = $\frac{2{,}70{,}400}{0.7}$

Or, EBIT = ₹ 3,86,285.71(approx.)

Solution 2:

(i) **Computation of EPS under three-financial plans**

Plan I: Equity Financing

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000
PAT	10,000	20,000	40,000	60,000	1,00,000
No. of equity shares	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
EPS	0.10	0.20	0.40	0.60	1

Plan II: Debt – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	40,000	40,000	40,000	40,000	40,000
EBT	(20,000)	0	40,000	80,000	1,60,000
Less: Tax @ 50%	10,000*	0	20,000	40,000	80,000
PAT	(10,000)	0	20,000	40,000	80,000
No. of equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(₹ 0.20)	0	0.40	0.80	1.60

* The Company can set off losses against the overall business profit or may carry forward it to next financial years.

Plan III: Preference Shares – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000

PAT	10,000	20,000	40,000	60,000	1,00,000
Less: Pref. dividend	40,000*	40,000*	40,000	40,000	40,000
PAT after Pref. dividend.	(30,000)	(20,000)	0	20,000	60,000
No. of Equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(0.60)	(0.40)	0	0.40	1.20

* In case of cumulative preference shares, the company has to pay cumulative dividend to preference shareholders, when company earns sufficient profits.

(ii) From the above EPS computations tables under the three financial plans we can see that when EBIT is ₹ 80,000 or more, Plan II: Debt-Equity mix is preferable over the Plan I and Plan III, as rate of EPS is more under this plan. On the other hand an EBIT of less than ₹ 80,000, Plan I: Equity Financing has higher EPS than Plan II and Plan III. Plan III Preference share Equity mix is not acceptable at any level of EBIT, as EPS under this plan is lower.

The choice of the financing plan will depend on the performance of the company and other macro economic conditions. If the company is expected to have higher operating profit Plan II: Debt – Equity Mix is preferable. Moreover, debt financing gives more benefit due to availability of tax shield.

Solution 3:

Ascertainment of probable price of shares of Prakash limited

Particulars	**Plan-I** **If ₹ 5,00,000 is raised as debt (₹)**	**Plan-II** **If ₹ 5,00,000 is raised by issuing equity Shares (₹)**
Earnings Before Interest and Tax (EBIT) {20% of new capital i.e., 20% of (₹15,00,000 + ₹ 5,00,000)} (Refer working note1)	4,00,000	4,00,000
Less: Interest on old debentures (10% of ₹5,00,000)	(50,000)	(50,000)
Less: Interest on new debt (12% of ₹5,00,000)	(60,000)	--
Earnings Before Tax (EBT)	2,90,000	3,50,000
Less: Tax @ 50%	(1,45,000)	(1,75,000)
Earnings for equity shareholders (EAT)	1,45,000	1,75,000
No. of Equity Shares (refer working note 2)	25,000	35,000
Earnings per Share (EPS)	₹ 5.80	₹ 5.00
Price/ Earnings (P/E) Ratio (refer working note 3)	8	10
Probable Price Per Share (PE Ratio × EPS)	₹ 46.40	₹ 50

Working Notes:

1. Calculation of existing Return of Capital Employed (ROCE):

	(₹)
Equity Share capital (25,000 shares × ₹10)	2,50,000
10% Debentures $\left(₹50,000 \times \frac{100}{10}\right)$	5,00,000
Reserves and Surplus	7,50,000
Total Capital Employed	15,00,000
Earnings before interest and tax (EBIT) (given)	3,00,000
ROCE = $\frac{₹3,00,000}{₹15,00,000} \times 100$	20%

2. Number of Equity Shares to be issued in Plan-II:

$= \frac{₹5,00,000}{₹50}$ = 10,000 Shares

Thus, after the issue total number of shares = 25,000+ 10,000 = 35,000 shares

3. Debt/Equity Ratio if ₹ 5,00,000 is raised as debt:

$= \frac{₹10,00,000}{₹20,00,000} \times 100$ = 50%

As the debt equity ratio is more than 40% the P/E ratio will be brought down to 8 in Plan-I

Solution 6:

Particulars	**Plan I (₹.)**	**Plan II (₹.)**	**Plan III (₹.)**	**Plan IV (₹.)**
Equity Share Capital	16,00,000	14,00,000	13,00,000	13,00,000

12% Long Term Loan (₹.)	-	2,00,000	-	-
9% Debentures	-	-	3,00,000	-
6% Preference Shares	-	-	-	3,00,000
EBIT	4,00,000	4,00,000	4,00,000	4,00,000
Interest on Debentures/Term Loan	Nil	(24,000) (₹. 2,00,000 ×12%)	(27,000) (₹. 3,00,000 ×9%)	Nil
EBT	4,00,000	3,76,000	3,73,000	4,00,000
Tax at 40%	(1,60,000)	(1,50,400)	(1,49,200)	(1,60,000)
EAT	2,40,000	2,25,600	2,23,800	2,40,000
Preference Dividend	Nil	Nil	Nil	(18,000)
Residual Earnings	2,40,000	2,25,600	2,23,800	2,22,000
No. of Equity Shares	1,60,000	1,40,000	1,30,000	1,30,000
EPS = $\frac{Residual\ Earnings}{No.of\ Equity\ Shares}$	₹. 1.50	₹.1.61	₹. 1.72	₹. 1.71
DFL(For Interest) = $\frac{EBIT}{EBT}$	1.00 times	1.06 times	1.07 times	1.00 times
DFL (For Interest & Pref. Dividend)	1.00 times	1.06 times	1.07 times	1.08 times

DFL (With Interest and Preference Dividend) = $\frac{EBIT}{EBIT-Interest-Pre\ Tax\ Preference\ Dividend}$ = $\frac{₹.4,00,000}{₹.4,00,000-Nil-₹.30,000}$ = 1.08

Pre tax preference Dividend = $\frac{Preference\ Dividend}{(100\%-Tax\ Rate)}$ = $\frac{₹.18,000}{60\%}$ = ₹. 30,000

Solution 11:

(i) Computation of Earnings per Share (EPS)

Plans	X (₹)	Y (₹)	Z (₹)
Earnings before interest & tax (EBIT)	1,00,000	1,00,000	1,00,000
Less: Interest charges (10% of ₹ 2,00,000)	--	(20,000)	--
Earnings before tax (EBT)	1,00,000	80,000	1,00,000
Less: Tax @ 50%	(50,000)	(40,000)	(50,000)
Earnings after tax (EAT)	50,000	40,000	50,000
Less: Preference share dividend (10% of ₹ 2,00,000)	--	--	(20,000)
Earnings available for equity shareholders (A)	50,000	40,000	30,000
No. of equity shares (B) Plan X = ₹ 4,00,000/ ₹ 20 Plan Y = ₹ 2,00,000 / ₹ 20 Plan Z = ₹ 2,00,000 / ₹ 20	20,000	10,000	10,000
E.P.S (A , B)	2.5	4	3

(ii) Computation of Financial Break-even Points

Financial Break-even point = Interest + Preference dividend/(1 - tax rate)

Proposal 'X' = 0

Proposal 'Y' = ₹ 20,000 (Interest charges)

Proposal 'Z' = Earnings required for payment of preference share dividend

= ₹ 20,000 ÷ (1- 0.5 Tax Rate) = ₹ 40,000

(iii) Computation of Indifference Point between the plans

Combination of Proposals

a. Indifference point where EBIT of proposal "X" and proposal 'Y' is equal

$\frac{(EBIT)(1-0.5)}{20,000\ shares}$ = $\frac{(EBIT-₹\ 20,000)(1-0.5)}{10,000\ shares}$

0.5 EBIT = EBIT – ₹ 20,000

EBIT = ₹ 40,000

b. **Indifference point where EBIT of proposal 'X' and proposal 'Z' is equal**:

$\frac{(EBIT)(1-0.5)}{20,000\ shares}$ = $\frac{EBIT\ (1-0.5)-₹\ 20,000}{10,000\ shares}$

0.5 EBIT = EBIT- ₹ 40,000

0.5 EBIT = ₹ 40,000

EBIT = $\frac{₹\ 40,000}{0.5}$ = ₹ 80,000

c. Indifference point where EBIT of proposal 'Y' and proposal 'Z' are equal

$$\frac{(EBIT - ₹\ 20,000)(1 - 0.5)}{10,000\ shares} = \frac{EBIT(1 - 0.5) - ₹\ 20,000}{10,000\ shares}$$

0.5 EBIT – ₹ 10,000 = 0.5 EBIT – ₹ 20,000

There is no indifference point between proposal 'Y' and proposal 'Z'

Analysis: It can be seen that financial proposal 'Y' dominates proposal 'Z', since the financial break-even-point of the former is only ₹ 20,000 but in case of latter, it is ₹ 40,000. EPS of plan 'Y' is also higher.

Solution 12:

(i) **Computation of Earnings per share (EPS)**

Plans	A	B	C
Earnings before interest and tax (EBIT)	10,00,000	10,00,000	10,00,000
Less: Interest Charges	---	(20,000) (10% x 2 lakh)	---
Earnings before tax (EBIT)	10,00,000	9,80,000	10,00,000
Less: Tax (@30%)	(3,00,000)	(2,94,000)	(3,00,000)
Earnings after tax (EAT)	7,00,000	6,86,000	7,00,000
Less: Preference Dividend	---	---	(20,000) (10% x ₹ 2 Lakh)
Earnings available for equity shareholders (A)	7,00,000	6,86,000	6,80,000
No. of Equity Shares (B)	20,000 (₹ 4 lakh ÷ ₹ 20)	10,000 (₹ 2 lakh ÷ ₹ 20)	10,000 (₹ 2 lakh ÷ ₹ 20)
EPS ₹ [(A) ÷ (B)]	35	68.6	68

(ii) **Calculation of Financial Break-even point**

Financial break-even point is the earnings which are equal to the fixed finance charges and preference dividend.

Plan A: Under this, plan there is no interest payment of ₹ 2,00,000 and no preference dividend. Hence, the Financial Break-even point will be zero.

Plan B: Under this plan, there is an interest payment of ₹ 20,000 and no preference dividend. Hence, the Financial Break-even point will be ₹ 20,000 (Interest charges)

Plan C: Under this plan, there is no interest payment but an after tax preference dividend of ₹ 20,000 is paid. Hence, the Financial Break – even point will be before tax earnings of ₹ 28,571 (i.e. ₹ 20,000 ÷ 0.7)

(iii) **Computation of indifference points between the plans.**

The Indifference between two alternative methods of financing is calculated by applying the following formula.

$$\frac{(EBIT - I1)\ (1 - T)}{E1} = \frac{(EBIT - I2)\ (1 - T)}{E2}$$

Where,

EBIT = Earnings before Interest and tax.

I1 = Fixed charges (interest or pref. dividend) under Alternative 1

I2 = Fixed charges (interest or pref. dividend) under Alternative 2

T = Tax rate

E1 = No. of equity shares in Alternative 1

E2 = No. of equity shares in Alternative 2

Now, we can calculate indifference points between different plans of financing.

(a) Indifference point where EBIT of Plan A and Plan B is equal.

$\frac{(EBIT - 0)(1 - 0.3)}{20,000} = \frac{(EBIT - 20,000)(1-0.3)}{10,000}$

0.7 EBIT (10,000) = (0.7 EBIT – 14,000) (20,000)
7,000 EBIT = 14,000 EBIT – 28 Crores
EBIT = 40,000

(b) Indifference point where EBIT of Plan A and Plan C is equal

$\frac{(EBIT - 0)(1 - 0.3)}{20,000} = \frac{(EBIT - 0)(1-0.3)}{10,000} - 20,000$

0.7 EBIT (10,000) = (0.7 EBIT – 20,000) (20,000)
7,000 EBIT = 14,000 EBIT – 40 crores
EBIT = 57,142.86

(c) Indifference point where EBIT of Plan B and Plan C are equal

$\frac{(EBIT - 20,000)(1 - 0.3)}{10,000} = \frac{(EBIT - 0)(1 - 0.3)}{10,000} - 20,000$

(0.7 EBIT – 14,000) (10,000) = (0.7 EBIT – 20,000) (10,000)
7,000 EBIT – 14 crore = 7,000 EBIT – 20 crore
There is no indifference point between the financial plans B and C.

Solution 16:

1. **Profitability statement under different Plans**

Plan I: Issue of 3,12,500 Equity shares at ₹. 10

Situation	A	B	C	D	E
EBIT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000
Less: Interest on debentures	Nil	Nil	Nil	Nil	Nil
EBT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000
Less: Tax at 40%	(₹. 25,000)	(₹. 50,000)	(₹.1,00,000)	(₹.1,50,000)	(₹. 2,50,000)
EAT	₹. 37,500	₹. 75,000	₹. 1,50,000	₹. 2,25,000	₹. 3,75,000
Less: Preference Dividend	Nil	Nil	Nil	Nil	Nil
Residual Earnings	₹. 37,500	₹. 75,000	₹. 1,50,000	₹. 2,25,000	₹. 3,75,000
No. of Equity shares	3,12,500	3,12,500	3,12,500	3,12,500	3,12,500
EPS = $\frac{Residual\ Earnings}{No.of\ Equity\ Shares}$	₹. 0.12	₹. 0.24	₹. 0.48	₹. 0.72	₹. 1.20

Plan II: Issue of 1,56,250 equity Shares at ₹. 10 and ₹. 15,625 8% Debentures of ₹. 100

Situation	A	B	C	D	E
EBIT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000
Less: Interest on debentures	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)
EBT	(₹. 62,500)	Nil	₹. 1,25,000	₹. 2,50,000	₹. 5,00,000
Add: Tax Savings	₹. 25,000	-	-	-	-
Less: Tax at 40%	-	Nil	(₹. 50,000)	(₹. 1,00,000)	(₹. 2,00,000)
EAT	(₹. 37,500)	Nil	₹. 75,000	₹. 1,50,000	₹. 3,00,000
Less: Preference Dividend	Nil	Nil	Nil	Nil	Nil
Residual Earnings	(₹. 37,500)	Nil	₹. 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 = $\frac{Residual\ Earnings}{No.of\ Equity\ Shares}$	(₹. 0.24)	Nil	₹. 0.48	₹. 0.96	₹. 1.92

Plan III: Issue of 1,56,250 Equity Shares at ₹. 10 and 15,625 8% Preference shares of ₹. 100

Situation	A	B	C	D	E
EBIT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000

Less: Interest on debentures	(Nil)	(Nil)	(Nil)	(Nil)	(Nil)
EBT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000
Less: Tax at 40%	(₹. 25,000)	(₹. 50,000)	(₹. 1,00,000)	(₹. 1,50,000)	(₹. 2,50,000)
EAT	₹. 37,500	₹. 75,000	₹. 1,50,000	₹. 2,25,000	₹. 3,75,000
Less: Preference Dividend	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)	(₹. 1,25,000)
Residual Earnings	₹. 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 = $\frac{Residual\ Earnings}{No.of\ Equity\ Shares}$	(₹. 0.56)	(₹. 0.32)	₹. 0.16	₹. 0.64	₹. 1.60

2. Recommendation: In order to maximise EPS, the optimal financing plan will be as under:

Situation	A	B	C	D	E
EBIT	₹. 62,500	₹. 1,25,000	₹. 2,50,000	₹. 3,75,000	₹. 6,25,000
Financing plan to be selected	I	I	I or II	II	II
Maximum EPS	₹. 0.12	₹. 0.24	₹. 0.48	₹. 0.96	₹. 1.92

3. Computation of EBIT – EPS Indifference Point (i.e. same EPS under two alternatives)

(a) Plan I and II

For equal EPS, Let the required EBIT be ₹. A

Plan I EPS = $\frac{A \times (1-0.40)}{3,12,500\ Shares}$

Plan II EPS = $\frac{(A-1,25,000) \times (1-0.40)}{1,56,250\ Shares}$

$\frac{0.6\ A}{3,12,500}$ = $\frac{0.6\ A-75,000}{1,56,250}$

0.6 A = 1.2 A – 1,50,000

A = ₹. 2,50,000

EBIT should be ₹. 2,50,000

(b) Plan I and II

For equal EPS, Let the required EBIT be ₹. B

Plan I EPS = $\frac{B \times (1-0.40)}{3,12,500\ Shares}$

Plan II EPS = $\frac{B \times (1-0.40) - 1,25,000}{1,56,250\ Shares}$

0.6 B = 1.2 B – 2,50,000

B = ₹. 4,16,667

EBIT should be ₹. 4,16,667

Solution 17.

Income statement

Particulars	I(Deb)	II(Equity)
Equity	50,00,000	50,00,000
New Equity	-	25,00,000
New Debt @ 8%	25,00,000	-

At indifference point

$(EBIT - I_1)(1-t) - PD_1/n_1 = (EBIT - I_2)(1-t) - PD_2$

(EBIT – 2,00,000) (1 – 50%)/5,00,000 = (EBIT – 0) (1 – 50%) – 0/7,50,000

0.5 EBIT – 1,00,000/ 50 = 0.5 EBIT/75

3.75 EBIT – 75,00,000 = 25 EBIT

12.5 EBIT = 75,00,000

EBIT = ₹ 6,00,000

Income Statement

	I	II
EBIT	6,00,000	6,00,000
(-) Int	(20,00,000)	(-)
EBT	4,00,000	6,00,000
(-) Tax @ 50%	(2,00,000)	(3,00,000)
EAT/EAES	2,00,000	3,00,000
(÷) No. of shares	5,00,000	7,50,000
EPS	₹ 0.4	₹ 0.4

Or you can verify this way
EPS_1 = (6,00,000 – 2,00,000) (1 - 50%)/5,00,000 = 0.4
EPS_2 = (6,00,000)(0.5)/7,50,000 = 0.4
Hence verified as $EPS_1 = EPS_2$

Uncommitted EPS means EPS which is obtained after keeping sinking fund amount of each year. Sinking fund is applicable only in that option where debentures are present. (Not only in equity option)
Uncommitted EPS = $(EBIT - I_1)(1 - t) - PD - Sinking\ Fund/n_1$

At indifference point, uncommitted EPS
$U\ EPS_1 = U\ EPS_2$
$(EBIT - I_1)(1-t) - sinking\ fund/n_1 = (EBIT - I_2)(1-t)/n_2$
(EBIT – 2,00,000)(0.5) – 2,50,000/5,00,000 = (EBIT) (0.5)/7,50,000
0.5 EBIT – 1,00,000 – 2,50,000/50 = 0.5 EBIT/75
37.5 EBIT – 2,62,50,000 = 25 EBIT
12.5 EBIT = 2,62,50,000
EBIT = 21,00,000
EPS_1 = (21,00,000 – 2,00,000) (0.5) – 2,50,000/5,00,000 = ₹ 1.4/share
EPS_2 = (21,00,000) (0.5)/7,50,000 = ₹ 1.4/share
Hence verified as $EPS_1 = EPS_2$

Solution 21:

Let the EBIT at the Indifference Point level be ₹. E (Amounts In ₹.)

Particulars	**Alternative 1**	**Alternative 2**
Description	₹. 50 ESC = ₹. 5,00,000	9% Debt = ₹. 5,00,000
EBIT	E	E
Less: Interest at 9% of ₹. 5,00,000	(Nil)	(45,000)
EBT	E	E
Less: Tax at 40%	(0.5 E)	(0.5 E – 22,500)
EAT	0.5 E	0.5 E – 22,500
Less: Preference Dividend	(Nil)	(Nil)
EAT	0.5 E	0.5 E – 22,500
No. of ₹. 50 equity shares(Present 20,000 + Additional 10,000)	30,000 Shares	20,000 shares
EPS = $\frac{EAT}{No.of\ Equity\ Shares}$	$\frac{0.5\ E}{30,000\ Shares}$	$\frac{0.5\ E-22,500}{20,000\ Shares}$

For indifference between the above alternatives, EPS should be equal.
$\frac{0.5E}{30,000} = \frac{0.5\ E-22,500}{20,000}$
1 E = 1.5 E – 67,500
0.5 E = 67,500
E = $\frac{67,500}{0.5}$ = ₹. 1,35,000
Required EBIT = ₹ 1,35,000 and EPS = ₹ 2.25

Solution 23:

Firm	**A**	**B**	**C**	**D**
EBIT	₹. 2,00,000	₹. 3,00,000	₹. 5,00,000	₹. 6,00,000
Less: Interest	(₹. 20,000)	(₹. 60,000)	(₹. 2,00,000)	(₹. 2,40,000)

EBT (Net Income)	₹. 1,80,000	₹. 2,40,000	₹. 3,00,000	₹. 3,60,000
K_e	12.00%	16.00%	15.00%	18.00%
Value of Equity (V_E) = EBT/K_e Value of Debt (V_D)= Interest/k_d [K_d =10%]	₹. 15,00,000 ₹. 2,00,000	₹. 15,00,000 ₹. 6,00,000	₹. 20,00,000 ₹. 20,00,000	₹.20,00,000 ₹. 24,00,000
Value of Firm V_F + V_E +V_D	₹. 17,00,000	₹. 21,00,000	₹. 40,00,000	₹. 44,00,000
K_0 = WACC = $\frac{EBIT}{Value\ of\ Firm}$	11.76%	14.29%	12.50%	13.64%

When Firm A borrow ₹ 2 Lakhs at 10% interest rate, to repay equity capital, the effect on WACC will be as under:

Firm	A	B
EBIT Less: Interest	₹. 2,00,000 (₹. 20,000)	₹. 2,00,000 (₹. 40,000)
EBT (Net Income)	₹. 1,80,000	₹. 1,60,000
K_e Value of Equity V_E =EBT/K_e Value of Debt V_D = Interest/k_d	12.00% ₹. 15,00,000 ₹. 2,00,000	12.00% ₹. 13,33,333 ₹. 4,00,000
Value of Firm V_P = V_E + V_D	₹. 17,00,000	₹. 17,33,333
K_O = WACC = $\frac{EBIT}{Value\ of\ Firm}$	11.76%	11.54%

Under Net Income Approach, Increase in Debt leads to increase in value of firm and decrease in WACC.

Solution 27:

Particulars	Amount (₹.)
EBIT Less: Interest (10% × 30,00,000)	9,00,000 (3,00,000)
EBT	6,00,000

Value of Firm = $\frac{EBIT}{K_0}$

= $\frac{9,00,000}{0.12}$ = 75,00,000

Value of Equity = Value of Firm – Value of Debt

= 75,00,000 – 30,00,000 = 45,00,000

K_e = $\frac{EBT}{Value\ of\ Equity}$

= $\frac{6,00,000}{45,00,000}$ = 13.33%

Solution 33:

(a) **Value of A Ltd.** = $\frac{NOI}{Ko}$ = $\frac{₹\ 4,50,000}{18\%}$ = ₹ 25,00,000

(i) Return on Shares of X on A Ltd.

Particulars	Amount (₹)
Value of the company	25,00,000
Market value of debt (60% x ₹ 25,00,000)	15,00,000
Market value of shares (40% x ₹ 25,00,000)	10,00,000
Particulars	**Amount (₹)**
Net operating income	4,50,000
Interest on debt (8% × ₹ 15,00,000)	1,20,000
Earnings available to shareholders	3,30,000
Return on 3% shares (3% × ₹ 3,30,000)	9,900

(ii) Implied required rate of return on equity of A Ltd. = $\frac{₹\ 3,30,000}{₹\ 10,00,000}$ = 33 %

(b) (i) **Calculation of Implied rate of return of B Ltd.**

Particulars	Amount (₹)
Total value of company	25,00,000

Market value of debt (20% × ₹ 25,00,000)	5,00,000
Market value of equity (80% × ₹ 25,00,000)	20,00,000
Particulars	**Amount (₹)**
Net operating income	4,50,000
Interest on debt (8% × ₹ 5,00,000)	40,000
Earnings available to shareholders	4,10,000

Implied required rate of return on equity = $\frac{₹\ 4,10,000}{₹\ 20,00,000}$ = 20.5%

(iii) Implied required rate of return on equity of B Ltd. is lower than that of A Ltd. because B Ltd. uses less debt in its capital structure. As the equity capitalization is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds.

Solution 34:

1. **Valuation of firms:**

Particulars	Levered company (₹.)	Unlevered company (₹.)
EBIT	30,000	30,000
Less: Interest	10,000	Nil
Earnings available to equity shareholders / Ke	20,000	30,000
	12.5%	12.5%
Value of equity	1,60,000	2,40,000
Debt	1,00,000	Nil
Value of Firm	2,60,000	2,40,000

Value of Levered company is more than that of unlevered company therefore investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk he will borrow proportionate amount and invest that amount also in shares of unlevered company.

2. **Investment and Borrowings**

Particulars	Amount (₹.)
Sell shares in levered company (1,60,000 x 15%)	24,000
Borrow money (1,00,000 x 15%)	15,000
Buy shares in unlevered company	39,000

3. **Change in Return**

Particulars	Amount (₹.)
Income from shares in unlevered company (39,000 x 12.5%)	4,875
Less: Interest on loan (15,000 x 10%)	(1,500)
Net income from unlevered firm	3,375
Income from levered firm (24,000 x 12.5%)	(3,000)
Incremental income due to Arbitrage	375

Solution 35:

Here we are assuming that MM Approach 1958: Without tax, where capital structure has no relevance with the value of company and accordingly overall cost of capital of both levered as well as unlevered company is same. Therefore, the two companies should have similar WACCs. Because Samsui Limited is all-equity financed, its WACC is the same as its cost of equity finance, i.e. 16 per cent. It follows that Sanghmani Limited should have WACC equal to 16 per cent also.

Therefore, Cost of equity in Sanghmani Ltd. (levered company) will be calculated as follows:

$K_0 = \frac{2}{3} \times K_e + \frac{1}{3} \times K_d = 16\%$ (i.e. equal to WACC of Samsui Ltd.)

Or, $16\% = \frac{2}{3} \times K_e + \frac{1}{3} \times 10\%$ Or, Ke = 19

Solution 36:

1. **Valuation of firms:**

Particulars	Levered company (₹.)	Unlevered company (₹.)
EBIT	30,000	30,000
Less: Interest	10,000	Nil
Earnings available to equity shareholders / Ke	20,000	30,000
	20%	12.5%
Value of equity	1,00,000	2,40,000
Debt	1,00,000	Nil
Value of Firm	2,00,000	2,40,000

Value of Unlevered company is more than that of Levered company therefore investor will sell his shares in unlevered company and buy shares in levered company. Market value of Debt and Equity of Levered company are in the ratio of ₹.1,00,000 : ₹.1,00,000, i.e., 1:1. To maintain the level of risk he will lend proportionate amount (50%) and invest balance amount (50%) in shares of Levered company.

2. **Investment and Borrowings**

Particulars	Amount (₹.)
Sell shares in levered company (2,40,000 x 15%)	36,000
Lend money (36,000 x 50%)	18,000
Buy shares in levered company (36,000 x 50%)	18,000
Total	36,000

3. **Change in Return**

Particulars	Amount (₹.)
Income from shares in levered company (18,000 x 20%)	3,600
Add: Interest on money lent (18,000 x 10%)	1,800
Total income after switch over	5,400
Income from unlevered firm (36,000 x 12.5%)	(4,500)
Incremental income due to Arbitrage	900

Solution 41:

Constant K_o means the use of NOI or M&M Approach, $K_e = K_o$ + Risk Premium.

From M & M Approach, $K_e = K_o + \frac{Debt}{Equity} (K_o - k_d)$ = 12% + [80% × (12% – 9%) = 14.40%

Solution 42:

(a) Computation of Market Value, Cost of Equity and WACC of RES Ltd.

Market Value of Equity = 25,00,00,000

K_e = 21%

$\frac{Net\ Income\ (NI)\ for\ equity-holders}{Ke}$ = Market Value of Equity

$\frac{Net\ income\ (NI)\ for\ equity-holders}{Ke}$ = 25,00,000

Net income for equity holders = 5,25,000

EBIT= 5,25,000/0.7 = 7,50,000

	All Equity	Debt and Equity
EBIT	7,50,000	7,50,000
Interest to debt-holders	-	75,000
EBT	7,50,000	6,75,000
Taxes (30%)	2,25,000	2,02,500
Income available to equity shareholders	5,25,000	4,72,500
Income to debt holders plus income available to shareholders	5,25,000	5,47,500

Present value of tax-shield benefits = 5,00,000 × 0.30 = 1,50,000

(i) Value of Restructured firm
= 25,00, + 1,50,000 = 26,50,000

(ii) Cost of Equity (K_e)

Total Value = 26,50,000
Less: Value of Debt = 5,00,000
Value of Equity = 21,50,000

$K_e = \frac{4,72,500}{21,50,000}$ = 0.219 = 22%

(iii) WACC
Cost of Debt (after tax) = 15% (1-0.3) = 0.15 (0.70) = 0.105 = 10.5%

Components of Costs	Amount	Cost of Capital	Weight	Weighted COC
Equity	21,50,000	0.22	0.81	0.178
Debt	5,00,000	0.105	0.19	0.020
	26,50,000			0.198

WACC = 19.8%

Comment: At present the company is all equity financed. So, Ke = Ko i.e. 21%. However after restructuring, the Ko would be reduced to 19.81% and Ke would increase from 21% to 21.98%. Reduction in Ko and increase in Ke is good for the health of the company.

Solution 43:

(a) **Amount of debt to be employed by firm as per traditional approach**

Calculation of Equity, Wd and We

Total Capital (₹)	Debt (₹)	Wd	Equity value (₹)	We
(a)	(b)	(b)/(a)	(c) = (a) - (b)	(c)/(a)
50,00,000	0	-	50,00,000	1.0
50,00,000	5,00,000	0.1	45,00,000	0.9
50,00,000	10,00,000	0.2	40,00,000	0.8
50,00,000	15,00,000	0.3	35,00,000	0.7
50,00,000	20,00,000	0.4	30,00,000	0.6
50,00,000	25,00,000	0.5	25,00,000	0.5
50,00,000	30,00,000	0.6	20,00,000	0.4

Statement of Weighted Average Cost of Capital (WACC)

Ke	We	Kd	Wd	Ke We	KdWd	Ko
(1)	(2)	(3)	(4)	(5) = (1) x (2)	(6) = (3) x (4)	(7) = (5) + (6)
0.100	1.0	-	-	0.100	-	0.100
0.105	0.9	0.060	0.1	0.095	0.006	0.101
0.110	0.8	0.060	0.2	0.088	0.012	0.100
0.113	0.7	0.062	0.3	0.079	0.019	0.098
0.124	0.6	0.070	0.4	0.074	0.028	0.102
0.135	0.5	0.075	0.5	0.068	0.038	0.106
0.160	0.4	0.080	0.6	0.064	0.048	0.112

So, amount of Debt to be employed = ₹ 15,00,000 as WACC is minimum at this level of debt i.e. 9.8 %

(b) As per MM approach, cost of the capital (Ko) remains constant and cost of equity increases linearly with debt.

Value of a firm = $\frac{Net\ operating\ income\ (NOI)}{Ko}$

₹ 50,00,000 = $\frac{₹\ 5,00,000}{Ko}$

Ko = $\frac{₹\ 5,00,000}{₹\ 50,00,000}$ = 10%

Statement of Equity Capitalization rate (ke) under MM approach

Debt (₹)	Equity (₹)	Debt / Equity	Ko	Kd	Ko - Kd	Ke = Ko +(Ko – Kd) *Debt/Equity

(1)	(2)	(3) = (1)/(2)	(4)	(5)	(6) = (4) -(5)	(7) = (4) + (6) x (3)
0	50,00,000	0	0.10	-	0.100	0.100
5,00,000	45,00,000	0.11	0.10	0.060	0.040	0.104
10,00,000	40,00,000	0.25	0.10	0.060	0.040	0.110
15,00,000	35,00,000	0.43	0.10	0.062	0.038	0.116
20,00,000	30,00,000	0.67	0.10	0.070	0.030	0.120
25,00,000	25,00,000	1.00	0.10	0.075	0.025	0.125
30,00,000	20,00,000	1.50	0.10	0.080	0.020	0.130

Solution 44:

Note that the ration given in this question is not debt to equity ratio. Rather than it is the debt to value ratio. Therefore, if the ratio is 0.6, it means that capital employed comprises 60% debt and 40% equity.

Ko = $\frac{Kd\ x\ Dx+Ke\ x\ S}{D+S}$

In this question total of weight is equal to 1 in all cases, hence we need not to divide by it.

1) K0 = 11% x 0 + 13% x 1 = 13%
2) K0 = 11% x 0.1 + 13% x 0.9 = 12.8%
3) K0 = 11.6% x 0.2 + 14% x 0.8 = 13.52%
4) K0 = 12% x 0.3 + 15% x 0.7 = 14.1%
5) K0 = 13% x 0.4 + 16% x 0.6 = 14.8%
6) K0 = 15% x 0.5 + 18% x 0.5 = 16.5%
7) K0 = 18% x 0.6 + 20% x 0.4 = 18.8%

Decision: 2nd option is the best because it has lowest WACC.

Solution 45:

Alternative 1 = Raising Debt of ₹5 lakh + Equity of ₹15 lakh
Alternative 2 = Raising Debt of ₹10 lakh + Equity of ₹10 lakh
Alternative 3 = Raising Debt of ₹14 lakh + Equity of ₹6 lakh

Calculation of Earnings per share (EPS)

Particulars	FINANCIAL ALTERNATIVES		
	Alternative 1	Alternative 2	Alternative 3
	(₹)	(₹)	(₹)
Expected EBIT [W. N. (a)]	19,50,000	19,50,000	19,50,000
Less: Interest [W. N. (b)]	(50,000)	(1,25,000)	(2,05,000)
Earnings before taxes (EBT)	**19,00,000**	**18,25,000**	**17,45,000**
Less: Taxes @ 40%	7,60,000	7,30,000	6,98,000
Earnings after taxes (EAT)	**11,40,000**	**10,95,000**	**10,47,000**
Number of shares [W. N. (d)]	1,07,500	1,05,000	1,03,000
Earnings per share (EPS)	**10.60**	**10.43**	**10.17**

Conclusion: Alternative 1 (i.e. Raising Debt of ₹5 lakh and Equity of ₹15 lakh) is recommended which maximises the earnings per share.

Working Notes (W.N.):

(a) Calculation of Earnings before Interest and Tax (EBIT)

Particulars		
Output (1,00,000 + 50%)	(A)	1,50,000
Selling price per unit		₹40
Less: Variable cost per unit (₹20 – 15%)		₹17
Contribution per unit	(B)	₹23
Total contribution	**(A x B)**	**₹34,50,000**
Less: Fixed Cost (₹10,00,000 + ₹5,00,000)		₹15,00,000

EBIT	**₹19,50,000**

(b) Calculation of interest on Debt

Alternative		(₹)	Total (₹)
1	(₹5,00,000 x 10%)		50,000
2	(₹5,00,000 x 10%)	50,000	
	(₹5,00,000 x 15%)	75,000	1,25,000
3	(₹5,00,000 x 10%)	50,000	
	(₹5,00,000 x 15%)	75,000	
	(₹4,00,000 x 20%)	80,000	2,05,000

(c) Number of equity shares to be issued

Alternative 1 $= \frac{₹(20,00,000 - 5,00,000)}{₹200\ (Market\ price\ of\ share)} = \frac{₹15,00,000}{₹200}$ = 7,500 shares

Alternative 2 $= \frac{₹(20,00,000 - 10,00,000)}{₹200 (Market\ price\ of\ share)} = \frac{₹10,00,000}{₹200}$ = 5,000 shares

Alternative 3 $= \frac{₹(20,00,000 - 14,00,000)}{₹200\ (Market\ price\ of\ share)} = \frac{₹6,00,000}{₹200}$ = 3,000 shares

(d) Calculation of total equity shares after expansion program

	Alternative 1	Alternative 2	Alternative 3
Existing no. of shares	1,00,000	1,00,000	1,00,000
Add: issued under expansion program	7,500	5,000	3,000
Total no. of equity shares	**1,07,500**	**1,05,000**	**1,03,000**

Solution 46:

The following are the costs and values for the firms A and B

(a) (i) Computation of Equilibrium value of Firms A & B under MM Approach:

As per MM approach K_O is equal to K_{eu}

$K_O = K_{eu}(1 - t) = 9.09 (1 - 0) = 9.09$

Particulars	A	B
EBIT (NOI) (₹)	5000	5000
KO (%)	9.09	9.09
Equilibrium value (₹) (NOI/Ko) x 100	55005.5	55005.5
	$\frac{5,000}{9.09} \times 100$	$\frac{5,000}{9.09} \times 100$

(ii) Computation of value of equity and cost of equity of Firms A & B

Particulars	A	B
Equilibrium value (₹)	55,005.50	55,005.50
Less: Value of Debt	-	30,000
Value of Equity	55,005.50	25,005.50

Cost of Equity of Firm A (unlevered) = 9.09

Cost of Debt of Firm B (K_d) (levered) = (1800/30000) x 100 = 6%

Cost of Equity of Firm B (Levered) = $K_O + (K_O - K_d)$ x (Debt / Equity)

= 9.09 + (9.09 – 6) x (30000/25005.5)

= 9.09 + 3.09 x 1.2 = 9.09 + 3.71 = **12.80%**

(OR)

Cost of Equity of Firm B (Levered) = $\left(\frac{NI}{Value\ of\ Equity}\right)$x 100

$=\frac{3,200}{25,005.5}$x 100 = **12.8%**

Solution 47:

1. Ascertainment of probable price of shares

Particulars	Plan (i) (If ₹ 4,00,000 is raised as debt) (₹)	Plan (ii) (If ₹ 4,00,000 is raised by issuing equity shares) (₹)
Earnings Before Interest (EBIT) 20% on (14,00,000 + 4,00,000)	3,60,000	3,60,000
Less: Interest on old debentures @ 10% on 4,00,000	40,000	40,000
	3,20,000	3,20,000
Less: Interest on New debt @ 12% on ₹ 4,00,000	48,000	-
Earnings Before Tax (After interest)	2,72,000	3,20,000
Less: Tax @ 50%	1,36,000	1,60,000
Earnings for equity shareholders (EAIT)	1,36,000	1,60,000
Number of Equity Shares (in numbers)	30,000	40,000
Earnings per Share (EPS)	4.53	4
Price/ Earnings Ratio	8	10
Probable Price Per Share	36.24 (8 x 4.53)	40 (10 x 4)

Working Notes:

	(₹)
1. Calculation of Present Rate of Earnings	
Equity Share capital (30,000 x ₹ 10)	3,00,000
10% Debentures $\left(40,000 \times \frac{100}{10}\right)$	4,00,000
Reserves (given)	7,00,000
	14,00,000
Earnings before interest and tax (EBIT) given	2,80,000
Rate of Present Earnings = $\left(\frac{2,80,000}{14,00,000} \times 100\right)$	20%
2. Number of Equity Shares to be issued in Plan $\left(\frac{4,00,000}{40}\right)$	10,000
Thus, after the issue total number of shares	30,000 + 10,000 = 40,000
3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:	$\left(\frac{8,00,000}{18,00,000} \times 100\right)$= 44.44%

As the debt equity ratio is more than 32% the P/E ratio shall be 8 in plan (i)

Solution 48:

Current Capital Structure		
Equity Share Capital	₹ 20 x 7 lakhs	₹ 1,40,00,000
Reserves		₹ 10,00,000
9% Bonds		₹ 3,00,00,000
11% Preference Share Capital	₹ 50 x 3 lakhs	₹ 1,50,00,000
Total Capital Employed		₹ 6,00,00,000

Proposed Capital Structure

Capital	Working	Proposal I	Proposal II
Capital to be raised		₹5,00,00,000	₹5,00,00,000
Equity	50000000 x 25%	₹ 1,25,00,000	-
	50000000 x 50%	-	₹ 2,50,00,000
Debt @ 10%	50000000 x 75%	₹ 3,75,00,000	-
Preference Shares @ 12%	50000000 x 50%	-	₹ 2,50,00,000

Combined Capital		Amount (proposal 1)	Amount (proposal 2)
Equity		₹ 2,65,00,000	₹ 3,90,00,000
Reserves		₹ 10,00,000	₹ 10,00,000
9% Bond		₹ 3,00,00,000	₹ 3,00,00,000
10% Debt		₹ 3,75,00,000	-
11% Preference Shares		₹ 1,50,00,000	₹ 1,50,00,000
12% Preference Shares		-	₹ 2,50,00,000
		₹ 11,00,00,000	**₹ 11,00,00,000**

Interest for Proposal I = ₹ 3,00,00,000 x 9% + ₹ 3,75,00,000 x 10%
= ₹ 27,00,000 + ₹ 37,50,000
= ₹ 64,50,000
Preference Dividend for Proposal I = ₹ 1,50,00,000 x 11% = ₹ 16,50,000
Interest for Proposal II = ₹ 3,00,00,000 x 9% = ₹ 27,00,000
Preference Dividend for Proposal II = ₹ 1,50,00,000 x 11% + ₹ 2,50,00,000 x 12%
= ₹ 16,50,000 + ₹ 30,00,000 = ₹ 46,50,000
Let the indifference point be ₹ X
For Proposal I,

$$EPS=\frac{(X-₹64,50,000)\times 0.66-₹16,50,000}{13,25,000}=\frac{(X-₹27,00,000)\times 0.66-₹46,50,000}{19,50,000}$$

$$\frac{0.66\times ₹42,57,000-₹16,50,000}{1,325}=\frac{0.66X-₹17,82,000-₹46,50,000}{1,950}$$

$$\frac{0.66x-₹59,07,000}{53}=\frac{0.66X-n₹64,32,000}{78}$$

51.48 X - ₹46,07,46,000 = 37.98X-₹34,08,96,000
16.5X = ₹11,98,50,000
Indifference Point = X = ₹72,63,636.36

Solution 49:
Calculation of Equity Share capital and Reserves and surplus:
Alternative 1:
Equity Share capital = ₹20,00,000 + =₹21,50,000
Reserves= ₹10,00,000 +=₹10,50,000
Alternative 2:
Equity Share capital = ₹ 20,00,000 + =₹27,20,000
Reserves= ₹10,00,000 +=₹11,80,000

Capital Structure Plans

Amount in ₹

Capital	Alternative 1	Alternative 2
Equity Share capital	21,50,000	27,20,000
Reserves and surplus	10,50,000	11,80,000
10% long term debt	15,00,000	15,00,000
14% Debentures	8,00,000	-
8% Irredeemable Debentures	-	1,00,000
Total Capital Employed	55,00,000	55,00,000

Computation of Present Earnings before interest and tax (EBIT)

EPS (₹)	21
No. of equity shares	20,000
Earnings for equity shareholders (I x II) (₹)	4,20,000
Profit Before Tax (III/75%) (₹)	5,60,000
Interest on long term loan (1500000 x 10%) (₹)	1,50,000
EBIT (IV + V) (₹)	7,10,000

EBIT after expansion = ₹7,10,000 +₹ 2,00,000 = ₹9,10,000
Evaluation of Financial Plans on the basis of EPS, MPS and Financial Leverage

Amount in ₹

Particulars	Alternative I	Alternate II

EBIT	9,10,000	9,10,000
Less: Interest: 10% on long term loan	(1,50,000)	(1,50,000)
14% on Debentures	(1,12,000)	Nil
8% on Irredeemable Debentures	Nil.	(8000)
PBT	6,48,000	7,52,000
Less: Tax @25%	(1,62,000)	(1,88,000)
PAT	4,86,000	5,64,000
No. of equity shares	21,500	27,200
EPS	**22.60**	**20.74**
Applicable P/E ratio (Working Note 1)	7	8.5
MPS (EPS X P/E ratio)	**158.2**	**176.29**
Financial Leverage EBIT/PBT	**1.40**	**1.21**

Working Note 1

	Alternative I	**Alternative II**
Debt:		
₹15,00,000 +₹8,00,000	23,00,000	-
₹15,00,000 +₹1,00,000	-	16,00,000
Total capital Employed (₹)	55,00,000	55,00,000
Debt Ratio (Debt/Capital employed)	=0.4182	=0.2909
	=41.82%	=29.09%
Change in Equity: ₹21,50,000-₹20,00,000	1,50,000	
₹27,20,000-₹20,00,000		7,20,000
Percentage change in equity	7.5%	36%
Applicable P/E ratio	**7**	**8.5**

Calculation of Cost of equity and various type of debt

	Alternative I	**Alternative II**
A) Cost of equity		
EPS	22.60	20.74
DPS (EPS X 60%)	13.56	12.44
Growth (g)	10%	10%
Po (MPS)	158.2	176.29
Ke= Do (1 + g)/ Po	$\frac{13.56(1.1)}{158.2}$	$\frac{12.44(1.1)}{176.29}$
	=9.43%	=7.76%
B) Cost of Debt:		
10% long term debt	10% + (1-0.25) = 7.5%	10% +(1-0.25) = 7.5%
14% redeemable debentures	$\frac{14(1-0.25)+(110-100/10)}{110+100/2}$ = 10.5 + 1 / 10.5 = 10.95%	nil
8% irredeemable debenture	NA	8000(1-0.25)/1,00,00 = 6%

Calculation of Weighted Average cost of capital (WACC)

	Alternative 1			**Alternative 2**		
Capital	**Weights**	**Cost (%)**	**WACC**	**Weights**	**Cost (%)**	**WACC**
Equity Share Capital	0.3909	9.43	3.69%	0.4945	7.76	3.84%
Reserves and Surplus	0.1909	9.43	1.80%	0.2145	7.76	1.66%
10% Long term Debt	0.2727	7.50	2.05%	0.2727	7.50	2.05%
14% Debenture	0.1455	10.95	1.59%			
8% Irredeemable Debentures	-			0.0182	6	0.11%
			9.12%			**7.66%**

Calculation Marginal Cost of Capital (MACC)

	Alternative 1			Alternative 2		
Capital	**Amount(weight)**	**Cost (%)**	**MACC**	**Amount (weight)**	**Cost (%)**	**MACC**
Equity Share Capital	₹ 1,50,000(0.15)	9.43	1.41%	₹7,20,000(0.72)	7.76	5.59%
Reserves and Surplus	₹ 50,000(0.05)	9.43	0.47%	₹1,80,000(0.18)	7.76	1.40%
14% Debenture	₹ 8,00,000(0.80)	10.95	8.76%	-		0.00%
8% Irredeemable Debentures	-			₹1,00,000(0.10)	6	0.60%
Total Capital Employed	₹10,00,000		10.65%	₹10,00,000		7.58%

Summary of solution:

	Alternate I	Alternate II
Earning per share (EPS)	22.60	20.74
Market price per share (MPS)	158.20	176.29
Financial leverage	1.4043	1.2101
Weighted Average cost of capital (WACC)	9.12%	7.66%
Marginal cost of capital (MACC)	10.65%	7.58%

Alternative 1 of financing will be preferred under the criteria of EPS, whereas Alternative II of financing will be preferred under the criteria of MPS, Financial leverage, WACC and marginal cost of capital.