4. LEVERAGES

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

a) **Income statement**

Particulars	Amount (Rs. In lakhs)
Sales	40
Less: Variable cost	(25)
Contribution	15
Less: Fixed cost	(6)
EBIT	9
Less: Interest	(3)
EBT	6

b)

i) Operating leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{15\,\text{lakhs}}{9\,\text{lakhs}} = 1.67$ times

ii) Financial leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{9\,\text{lakhs}}{6\,\text{lakhs}} = 1.5$ times

PROBLEM NO: 2

Computation of Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Combined Leverage (DCL):

Particulars	Firm N	Firm S	Firm D
a) Output (Units)	17,500	6,700	31,800
	Rs.	**Rs.**	**Rs.**
b) Selling Price/Unit	85	130	37
c) Sales Revenue (Output x Selling Price per Unit) (A)	14,87,500	8,71,000	11,76,600
d) Variable Cost/Unit	38.00	42.50	12.00
e) **Less:** Total Variable Cost (Output x Variable Cost per Unit) (B)	6,65,000	2,84,750	3,81,600
f) Contribution (C) (A-B)	8,22,500	5,86,250	7,95,000
g) **Less:** Fixed Cost	4,00,000	3,50,000	2,50,000
h) Earnings before Interest and Tax (EBIT)	4,22,500	2,36,250	5,45,000
i) **Less:** Interest on Loan	1,25,000	75,000	Nil
j) EBT	2,97,500	1,61,250	5,45,000
Operating Leverage (OL) = C / EBIT	8,22,500 / 4,22,500	5,86,250 / 2,36,250	7,95,000 / 5,45,000
	= 1.95	= 2.48	= 1.46
Financial Leverage (FL) = EBIT / PBT	4,22,500 / 2,97,500	2,36,250 / 1,61,250	5,45,000 / 5,45,000
	= 1.42	= 1.47	= 1.00
Combined Leverage (CL) = OL x FL	1.95 x 1.42	2.48 x 1.47	1.46 x 1
OR CL = Contribution / EBT	= 2.77 8,22,500 / 2,97,500 = 2.77	= 3.65 5,86,250 / 1,61,250 = 3.64	= 1.46 7,95,000 / 5,45,000 =1.46

PROBLEM NO: 3

a) Income Statement:

Particulars	Firms			
	A	B	C	D
Sales (units)	5,000	5,000	5,000	5,000
Sales revenue (Units × price) (Rs.)	1,00,000	1,60,000	2,50,000	3,50,000
Less: Variable cost	(30,000)	(80,000)	(1,00,000)	(2,50,000)
(Units × variable cost per unit) (Rs.)				
Less: Fixed operating costs (Rs.)	(60,000)	(40,000)	(1,00,000)	Nil
EBIT	10,000	40,000	50,000	1,00,000

b) Estimation of Various leverages:

$$\text{DOL} = \frac{\text{Current sales (S)- Variable costs (VC)}}{\text{Current EBIT}}$$

$$\text{DOL (A)} = \frac{\text{Rs.1,00,000} - \text{Rs.30,000}}{\text{Rs.10,000}} = 7 \text{ times}$$

$$\text{DOL (B)} = \frac{\text{Rs.1,60,000} - \text{Rs.80,000}}{\text{Rs.40,000}} = 2 \text{ times}$$

$$\text{DOL (C)} = \frac{\text{Rs.2,50,000} - \text{Rs.1,00,000}}{\text{Rs.50,000}} = 3 \text{ times}$$

$$\text{DOL (D)} = \frac{\text{Rs.3,50,000} - \text{Rs.2,50,000}}{\text{Rs.1,00,000}} = 1 \text{ times}$$

The operating leverage exists only when there are fixed costs. In the case of firm D, there is no magnified effect on the EBIT due to change in sales. A 20 per cent increase in sales has resulted in a 20 per cent increase in EBIT. In the case of other firms, operating leverage exists. It is maximum in firm A, followed by firm C and minimum in firm B. The interception of DOL of 7 is that 1 per cent change in sales results in 7 per cent change in EBIT level in the direction of the change of sales level of firm A.

PROBLEM NO: 4

Total Assets = Rs 20 crores

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = 20 × 2.5 = Rs 50 crores

Computation of Profit after Tax (PAT)

Particulars	(Rs in crores)
Sales	50.00
Less: Variable Operating Cost @ 65%	32.50
Contribution	17.50
Less: Fixed Cost (other than Interest)	4.00
EBIT	13.50
Less: Interest on Debentures (15% × 10)	1.50
PBT	12.00
Less: Tax @ 30%	3.60
PAT	8.40

i) Earnings per Share:

EPS = 8.40 crores / Number of Equity Shares = 8.40 crores / 50,00,000 = Rs 16.80

It indicates the amount the company earns per share. Investors use this as a guide while valuing the share and making investment decisions. It is also a indicator used in comparing firms within an industry or industry segment.

ii) Operating Leverage:

Operating Leverage = Contribution / EBIT = 17.50 / 13.50 = 1.296 times

It indicates the choice of technology and fixed cost in cost structure. It is level specific. When firm operates beyond operating break-even level, then operating leverage is low. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

iii) Financial Leverage:

Financial Leverage = EBIT / PBT = 13.50 / 12.00 = 1.125 times

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

iv) Combined Leverage:

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{PBT}}$$

Or, = Operating Leverage × Financial Leverage = 1.296 × 1.125 = 1.458 times

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales. The leverages - operating, financial and combined are measures of risk.

PROBLEM NO: 5

Statement showing the calculation of degree of various leverages

Particulars	2,000 units (Rs.)	2,500 units (Rs.)	3,000 units (Rs.)
A. Sales	28,000	35,000	42,000
B. Less: Variable Costs	18,000	22,500	27,000
C. Contribution	10,000	12,500	15,000
D. Less: Fixed Costs	10,000	10,000	10,000
E. Earnings Before Interest & Tax (EBIT)	0.00	2,500	5,000
F. Operating Leverage (Contribution/EBIT)	-	5	3

At the sales volume of 3,000 units the EBIT is Rs. 5,000 which is double the EBIT of Rs. 2,500 which is at the sales volume of 2,500 units because of the fact that the operating leverage is 5 times at the sales volume of 2,500 units. Hence by increase of 20% in sales volume. The operating profit is increased by 100% i.e. 5 times of 20%. At the level of 3,000 units, the operating leverage is 3 times. Thus, as the sales volume increases from 2,000 units to 2,500 units and 3,000 units, the operating leverage goes on decreasing from @ to 5 and 3 respectively.

PROBLEM NO: 6

Income Statement

Particulars	Amount (Rs.)	Amount (Rs.)
Sales (in units)	60,000	50,000
Sales Value @ Rs. 12 per unit	7,20,000	6,00,000
Variable Cost	(4,80,000)	(4,00,000)
Contribution	2,40,000	2,00,000
Fixed expenses	(1,00,000)	(1,00,000)
EBIT	1,40,000	1,00,000
Debenture Interest	(50,000)	(50,000)
EBT	90,000	50,000
Tax @ 30%	(27,000)	(15,000)
Profit after tax (PAT)	63,000	35,000
i) Earnings per share (EPS) Decrease in EPS = 12.6 - 7 = 5.6 % of decrease in EPS = $\frac{5.6}{12.6} \times 100 = 44.44\%$	$12.6 \left(\frac{63,000}{5,000}\right)$	$7 \left(\frac{35,000}{5,000}\right)$
ii) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$1.71 \left(\frac{2,40,000}{1,40,000}\right)$	$2 \left(\frac{2,00,000}{1,00,000}\right)$

iii) Financial Leverage = $\frac{EBIT}{EBT}$	1.5555 $\left(\frac{1,40,000}{90,000}\right)$	2 $\left(\frac{1,00,000}{50,000}\right)$

PROBLEM NO: 7

Part A: Financial Leverage

Estimation percentage of increase in EBT if there is 6% increase in EBIT,

a) DFL = EBIT / EBT = 40,000 / 35,000 = 1.143 times.

b) At any cost 1% change in EBIT leads to 1.143% change in EBT.

∴ If 6% change in EBIT = 6 x 1.143 = 6.858% ≅ 6.86%

(Verification of answer)

Particulars	At 100%	At 106%
a) EBIT	40,000	42400
b) Interest	(5,000)	(5,000)
c) EBT	35,000	37400
	% of increase in EBT = $\left(\frac{37,400-35,000}{35,000}\right)$ = 6.86%	

Part B: Operating Leverage

Estimation percentage of increase in EBIT if there is 10% increase in sales:

a) DOL = Contribution / EBIT = 1,40,000 / 40,000 = 3.5 times.

b) At any cost, 1% change in sales leads to 3.5% change in EBIT.

∴ If 10% change in Sales = 10 x 3.5 = 35 %

(Verification of answer)

Particulars	Amount at 100%	Amount at 110%
a) Sale	2,00,000	2,20,000
b) Variable Cost	(60,000)	66,0000
c) Contribution	1,40,000	1,54,000
d) Fixed Cost	(1,00,000)	1,00,000
e) EBIT	40,000	54,000
	% of increase in EBIT = $\left(\frac{54,000-40,000}{40,000}\right)$ = 35%	

Part C: Combined Leverage

Estimation percentage of increase in EBT if there is 6% increase in sales:

Combined Leverage = $\frac{Contribution}{EBIT} \times \frac{EBIT}{PBT}$

Or = Contribution / PBT

DCL = 1,40,000 / 35,000 = 4 times

At any cost, 1% change in sales leads to 4% change in EBT.

∴ If 6% increase in Sales = 6 x 4 = 24 %

Particulars	At 100%	At 106%
a) Sales	2,00,000	2,12,000
b) Variable Cost	60,000	(63,600)
c) Contribution	1,40,000	1,48,400
d) Fixed Cost	(1,00,000)	(1,00,000)
e) EBIT	40,000	48,400
f) Interest	(5,000)	(5,000)
g) EBT	35,000	43,400

	% of increase in EBT = $\left(\frac{43,400 - 35,000}{35,000}\right)$ = 24%

PROBLEM NO: 8

a) Calculation of Leverages:

Particulars	P Ltd.	Q Ltd.
Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	2	2.33
Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$	1.5	1.5
Combined Leverage = O.L x F.L (or) $\frac{\text{Contribution}}{\text{EBT}}$	3	3.495

b) Comments:

i) The operating risk of Q Ltd. is more than that of P Ltd.

ii) Both the company stand in equal risk position with respect to financial leverage.

iii) The combined risk of Q Ltd. is more than that of P Ltd.

PROBLEM NO: 9

1. Total contribution = 1,000 units x Rs. 60 per unit	Rs. 60,000
2. DCL $\frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs. 60,000}}{\text{EBT}} = 24$. So, EBT $= \frac{\text{Rs. 60,000}}{24}$	Rs. 2,500
3. Earnings after tax = EBT less 30% tax thereon = Rs. 2,500 - 30% thereon	**Rs. 1,750**

PROBLEM NO: 10

Income Statements of Company A and Company B

Particulars	Company A (Rs.)	Company B (Rs.)
Sales	91,000	1,05,000
Less: Variable cost	56,000	63,000
Contribution	35,000	42,000
Less: Fixed Cost	20,000	31,500
Earnings Before Interest and Tax (EBIT)	15,000	10,500
Less: Interest	12,000	9,000
Earnings Before Tax (EBT)	3,000	1,500
Less: Tax @ 30%	900	450
Earnings After Tax (EAT)	2,100	1,050

Working Notes:

Company A:

i) Financial Leverage $= \frac{\text{EBIT}}{\text{EBT i.e EBIT - Interest}}$

So, 5 $= \frac{\text{EBIT}}{\text{EBIT - 12,000}}$

Or, 5 (EBIT - 12,000) = EBIT

Or, 4 EBIT = 60,000

Or, EBIT = Rs.15,000

ii) Contribution = EBIT + Fixed Cost

= Rs. 15,000 + Rs. 20,000 = Rs. 35,000

iii) Sales = Contribution + Variable cost
= Rs. 35,000 + Rs. 56,000 = Rs. 91,000

Company B:

i) Contribution = 40% of Sales (as Variable Cost is 60% of Sales)
= 40% of 1,05,000 = Rs. 42,000

ii) Operating Leverage = Contribution / EBIT Or, 4 = Rs. 42,000 / EBIT
EBIT = Rs. 42,000 / 4 = Rs.10,500

iii) Fixed Cost = Contribution - EBIT = 42,000 - 10,500 = Rs. 31,500

PROBLEM NO: 11

Income Statement

Particulars	A	B	C
Sales (W.N-2)	3,600	8,000	12,000
Less: Variable cost (b/f)	(2,400)	(6,000)	(6,000)
Contribution	1,200	2,000	6,000
Less: Fixed Cost (b/f)	(900)	(1,600)	(4,000)
EBIT (W.N-1)	300	400	2,000
Less: Interest	(200)	(300)	(1,000)
EBT (W.N-1)	100	100	1,000
Less: Tax	(45)	(45)	(450)
EAT	55	55	550

Working Note 1: Calculation of EBIT and Contribution

Particulars	A	B	C
Degree of financial Leverage (DFL)	3:1	4:1	2:1
$\frac{EBIT}{EBT} = \frac{EBT + INT}{EBT} = DPL$	$\frac{EBT + 200}{EBT} = 3$	$\frac{EBT + 300}{EBT} = 4$	$\frac{EBT + 1000}{EBT} = 2$
	3 EBT - EBT = 200	4 EBT - EBT = 300	2 EBT - EBT = 1000
	EBT = 100	EBT = 100	EBT = 1000
EBIT = EBT+INT (A)	100 + 200 = 300	100 + 300 = 400	1000 + 1000 = 2000
Degree of operating leverage (DOL)	4:1	5:1	3:1
$\frac{Contribution}{EBIT} = DOL$	$\frac{x}{300} = 4$	$\frac{x}{400} = 5$	$\frac{x}{2000} = 3$
Contribution (x) (B)	1,200	2,000	6,000

Working Note 2: Calculation of sales

Particulars	A	B	C
Given VC As a % of sales	66.66%	75%	50%
$\frac{Contribution}{Sales}$	33.33%	25%	50%
Contribution	1,200	2,000	6,000
Sales	$3,600\left(\frac{1,200}{33.33\%}\right)$	$8,000\left(\frac{2,000}{25\%}\right)$	$12,000\left(\frac{6,000}{50\%}\right)$

PROBLEM NO: 12

Working Note 1: Degree of Financial Leverage = $\frac{EBIT}{EBT} = 3$

$$\frac{EBIT}{EBIT - Rs.10,00,000} = 3$$

3 EBIT - Rs.30,00,000 = EBIT

$$EBIT = \frac{Rs.\ 30,00,000}{2} = Rs.15,00,000$$

Working Note 2: Contribution = Fixed Cost + EBIT = Rs.50,00,000 + Rs.15,00,000 = Rs.65,00,000

a) Degree of Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs. 65,00,000}}{\text{Rs. 15,00,000}}$ = 4.33 times

b) Sales Volume = $\frac{\text{Total Contribution}}{\text{Contribution Per Unit}} = \frac{\text{Rs. 65,00,000}}{\text{Rs.200}}$ = 32,500 units

PROBLEM NO: 13

Working Notes:

1. Estimation of Contribution based on P/V Ratio

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$25.55\% = \frac{\text{Contribution}}{42,00,000}$$

Contribution = 10,73,100

2. EBIT = Contribution - Fixed Cost = 10,73,100 - 3,48,000 = 7,25,100

3. EBT = EBIT- Interest = 7,25,100 - [18,50,000 x 11%] = 7,25,100 - 2,03,500 = 5,21,600

a) Calculation of Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{10,73,100}{7,25,100}$ = 1.48 times

b) Calculation of Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{10,73,100}{5,21,600}$ = 2.06 times

c) Calculation of EPS = $\frac{(\text{EBIT} - \text{Interest})(1-t)}{\text{No of Shares}} = \frac{(7,25,000 - 2,03,500)\ (1-35\%)}{2,,50,,000}$ = 1.36

PROBLEM NO: 14

a)

Step 1: Finding of Sales Revenue:

$$\text{Given total Asset turnover ratio} = \frac{\text{Turnover/ sales}}{\text{TotalAssets}} = 3$$

$$\frac{\text{Sales}}{2,00,000} = 3$$

$$\text{Sales} = 6,00,000$$

Step 2: Profit Statement:

Particulars	Amount (Rs.)
a) Sales revenue	6,00,000
b) **Less:** Variable Cost (Rs.6,00,000 x 40%)	2,40,000
c) Contribution	**3,60,000**
d) **Less:** Fixed Cost	1,00,000
e) EBIT	**2,60,000**
f) **Less:** Interest (80,000 x 10%)	8,000
g) EBT	**2,52,000**
h) **Less:** Tax @ 35%	88,200
i) EAT / EAESH	**1,63,800**
j) No. of Equity Shares $\frac{60,000}{10}$	6,000 Shares
k) EPS $\left(\frac{\text{EAESH}}{\text{No.of Shares}}\right)$	27.3

Step 3: Calculation of Leverages:

Degree of Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{3,60,000}{2,60,000} = 1.38$

Degree of Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{2,60,000}{2,52,000} = 1.031$

Degree of Combined Leverage $= 1.39 \times 1.031 \cong 1.43$ (or) $\frac{3,60,000}{2,52,000} = 1.43$

b)

EPS is Rs. 1:

We know that EPS $= \frac{(EBIT - Int)(1-t)}{n}$

$1 = \frac{(EBIT - 8,000)(1-0.35)}{6,000}$

$6,000 = (EBIT - 8,000)(0.65)$

$EBIT - 8,000 = \frac{6,000}{0.65} = 9,230.76$

$EBIT = 17,230.76$

If the level of EBIT is 17,231 then EPS will be equal to Rs. 1

EPS is Rs. 3:

We know that EPS $= \frac{(EBIT - Int)(1-t)}{n}$

$3 = \frac{(EBIT - 8,000)(1-0.35)}{6,000}$

$EBIT - 8,000 = \frac{18,000}{0.65}$

$EBIT = 35,692.31$

EPS is Rs. 0:

We know that EPS $= \frac{(EBIT - Int)(1-t)}{n}$

$0 = \frac{(EBIT - 8,000)(1-0.35)}{6,000}$

$EBIT = 8,000$

PROBLEM NO: 15

Income Statement:

Particulars	Amount (Rs.)
Sales	75,00,000
Less: Variable cost (56% of Rs. 75,00,000)	(42,00,000)
Contribution	33,00,000
Less: Fixed costs	(6,00,000)
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt (@ 9% on Rs 45 lakhs)	(4,05,000)
Earnings before tax (EBT)	22,95,000

i) $ROI = \frac{EBIT}{\text{Capital Employed}} \times 100 = \frac{27,00,000}{55,00,000 + 45,00,000} \times 100 = 27\%$

(ROI is calculated on Capital Employed)

ii) ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

iii) Capital Turnover= $\frac{\text{Net sales}}{\text{Capital}} = \frac{\text{Rs.75,00,000}}{\text{Rs. 1,00,00,000}} = 0.75$

Which is very low as compared to industry average of 3.

iv) Calculation of Operating, Financial and Combined leverages

a) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{33,00,000}{27,00,000} = 1.22$

b) Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{27,00,000}{22,95,000} = 1.18$

c) Combined Leverage $= \frac{\text{Contribution}}{\text{EBT}} = \frac{33,00,000}{22,95,000} = 1.44$

Or = Operating Leverage × Financial Leverage = 1.22 × 1.18 = 1.44 (approx)

v) Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22 × 10 i.e. 12.20% (approx.)

vi) Since the combined Leverage is 1.44, sales have to drop by 100/1.44 i.e. 69.44% to bring EBT to Zero

Accordingly, New Sales = Rs. 75,00,000 × (1 - 0.6944)

= Rs. 75,00,000 × 0.3056

= Rs. 22,92,000 (approx)

Hence at Rs. 22,92,000 sales level EBT of the firm will be equal to Zero.

vii) Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by 1.18 × 20 = 23.6% (approx)

PROBLEM NO: 16

Particulars	Situation A		Situation B	
	Plan XY	Plan XM	Plan XY	Plan XM
Selling price p.u	30	30	30	30
Variable cost p.u	(20)	(20)	(20)	(20)
Contribution per unit	10	10	10	10
Sales (units)	6,000	6,000	6,000	6,000
Total Contribution	60,000	60,000	60,000	60,000
Fixed Cost	(20,000)	(20,000)	(25,000)	(25,000)
EBIT	40,000	40,000	35,000	35,000
Interest (W.N)	(4,800)	(1,200)	(4,800)	(1,200)
EBT	35,200	38,800	30,200	33,800
DOL = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{60,000}{40,000} = 1.5$	$\frac{60,000}{40,000} = 1.5$	$\frac{60,000}{35,000} = 1.71$	$\frac{60,000}{35,000} = 1.71$
DFL = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{40,000}{35,200} = 1.14$	$\frac{40,000}{38,800} = 1.03$	$\frac{35,000}{30,200} = 1.16$	$\frac{35,000}{33,800} = 1.04$
DCL = OL X FL	1.5 x 1.14 = 1.71	1.5 x 1.03 = 1.545	1.71 x 1.16 = 1.984	1.71 x 1.04 = 1.778

Working Note: Interest Calculation

Plan XY = 40,000 x 12% = 4,800

Plan XM = 10,000 x 12% = 1,200

PROBLEM NO: 17

Particulars	Amount (Rs)
Net Profit	1,82,000
Tax @ 30%	78,000
EBT	2,60,000

Interest on debentures	40,0000
EBIT	3,00,000
Operating Expenses 1.50 times	4,50,000
Sales	7,50,000

i) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{7,50,000 - 3,60,000}{3,00,000} = \frac{3,90,000}{3,00,000} = 1.30$ times

Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{3,00,000}{2,60,000} = 1.15$ times

ii) Preference Dividend Cover = PAT/Preference share Dividend

= 1,82,000/50,000 = 3.64 times

Equity Dividend Cover = PAT - Pref. div/Equity Dividend

=1,82,000 - 50,000/1,20,000 = 1.10 times

iii) Earning yield= EPS/Market Price X100 = 1,32,000/ 80,000 = 8.25%

Price Earnings Ratio = Market price / EPS = 20/1.65 = 12.1 times

iv) Net Funds Flow = Net Profit After Tax + Depreciation- Total Dividend

= 1,82,000 + 90,000 - (50,000 + 1,20,000)

= 2,72,000 - 1,70,000

= 1,02,000

PROBLEM NO: 18

Evaluation of proposal of process change assuming additional investment raised through debt

Particulars	Existing	New
Sales	(5,000 × 100) 5,00,000	(7,00,000 × 95) 6,65,000
Less: Variable cost (W.N-1)	(2,50,000 / 5,000 = 50) 2,50,000	(7,000 × 40) 2,80,000
Contribution	2,50,000	3,85,000
Less: Fixed cost	2,00,000	2,50,000
EBIT	50,000	1,35,000
Less: Interest	-	(4,00,000 × 10%) 40,000
EBT	50,000	95,000

W.N-1: Under existing proposal total variable cost = 5,00,000 - 2,50,000 = Rs. 2,50,000

$\therefore$ Variable Cost per unit $= \frac{2,50,000}{5,000}$ = Rs. 50

Given that variable cost reduced by Rs.10 per unit under new proposal.

$\therefore$ Variable Cost per unit = 50-10 = Rs. 40, Total Variable cost = 7,000 × 40 = Rs. 2,80,000

Conclusion: The overall profits of the company (EBT) have increased from Rs.50,000 to Rs.95,000. So it is advisable for the company to implement the proposed changes.

Additional Return on Investment $= \frac{45,000}{4,00,000} \times 100 = 11.25\%$.

If additional investment is raised through equity then additional return on investment

$$= \frac{1,35,000 - 50,000}{4,00,000} \times 100 = 21.25\%$$

Particulars	Existing	New
Breakeven point $= \frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$= \frac{2,00,000}{50}$ = 4,000 units	$= \frac{2,50,000}{95-40} \cong 4,545.45$ = 4,546 units*

Degree of Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	5 times	2.85 times

* Break-even point is rounded off to next number

Assumption: It is assumed that additional investment is raised through debt.

PROBLEM NO: 19

Working Notes:

a) Financial Leverage = $\frac{\text{Combined Leverage}}{\text{Operating Leverage}} = \frac{6}{3} = 2$

Financial Leverage = $\frac{\text{EBIT}}{\text{EBT} - \left(\frac{\text{Preference dividend}}{1 - \text{Tax}}\right)} = \frac{\text{EBIT}}{\text{EBIT} - 2{,}50{,}000 - 2{,}00{,}000} = 2$

EBIT = 2 EBIT - Rs.9,00,000

EBIT = Rs.9,00,000

b) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = 3$

EBIT = Rs.9,00,000 x 3 = Rs.27,00,000

Sales = Variable Cost + Contribution = Rs.10,00,000 + Rs.27,00,000 = Rs.37,00,000

PROBLEM NO: 20

Company	M	N	P	Q	R
Degree of Operating Leverage = $\frac{\text{Change in EBIT}}{\text{Change in Sales}}$ (in times)	$\frac{26\%}{28\%} = 0.93$	$\frac{34\%}{27\%} = 1.26$	$\frac{38\%}{25\%} = 1.52$	$\frac{43\%}{23\%} = 1.87$	$\frac{40\%}{25\%} = 1.60$
Degree of Combined Leverage = $\frac{\text{Change in EPS}}{\text{Change in Sales}}$ (in times)	$\frac{32\%}{28\%} = 1.14$	$\frac{26\%}{27\%} = 0.96$	$\frac{23\%}{25\%} = 0.92$	$\frac{27\%}{23\%} = 1.17$	$\frac{28\%}{25\%} = 1.12$

PROBLEM NO: 21

Step-1: Calculation of EPS in A Ltd. & B Ltd.

Particulars	A Ltd.	B Ltd.
EBIT	1,00,000	1,00,000
Less: Interest	-	(2,50,000 × 9%) 22,500
EBT	1,00,000	77,500
Less: Tax @ 50%	50,000	38,750
EAT / EAESH (A)	50,000	38,750
No. of Equity shares (B)	$\left(\frac{5L}{10}\right)$ 50,000	$\left(\frac{2.5L}{10}\right)$ 25,000
EPS (A/B)	1/-	1.55/-

Step-2: Some reasons for higher level of EPS in B Ltd.

a) No. of shares in B Ltd. are less when compared to A Ltd.

b) B Ltd. will get the advantage of tax shield, as interest is an allowable expenditure.

c) The interest on debentures for B Ltd. is just 9% whereas return on capital employed is 20%, the additional benefit will also be passed on to equity share holders.

Ex: When return on capital employed is 8%

Particulars	A Ltd.	B Ltd.
EBIT (5,00,000 x 8%)	40,000	40,000
Less: Interest	-	22,500
EBT	40,000	17,500

Less: Tax @ 50%	20,000	8,750
EAT/EAESH	20,000	8,750
EPS	0.4	0.35

When return on capital employed is 9%

Particulars	A Ltd.	B Ltd.
EBIT	45,000	45,000
Less: Interest	-	22,500
EBT	45,000	22,500
Less: Tax @ 50%	22,500	11,250
EAT/EAESH	22,500	11,250
EPS	0.45	0.45

THE END