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

30	Handwritten solution provided		

Sol'd

Profit & Loss Statement

Particulars		Amount (₹)
Sales	100%	2,00,000 ← (60,000 / 30% × 100%)
− VC	70%	− 1,40,000
Contribution	30%	60,000 (WN 4)
− FC	(BS)	− 30,000
EBIT (WN 3)		30,000
− Int		− 1,800 (8% × 1,25,000)
EBT		28,200
− Tax	− 30%	− 8460
EAT & EAES		19740
÷ number shares		÷ 1000 (BS)
EPS (WN 2)		₹19.74

WN①

Pre Tax Int (1 − t) = Post Tax Int

Pre Tax Int rate (1 − 30%) = 5.60%

Pre Tax Int rate = $\frac{5.60\%}{0.7}$

Pre Tax Int rate = 8%

WN②

$$PIE\ ratio = \frac{MPS}{EPS}$$

$$10 = \frac{140}{EPS}$$

EPS = 14

Sol (2)

WN (3) $DFL = \frac{EBIT}{EBIT - Int}$

$$1.5 = \frac{E}{E - 10{,}000}$$

$$1.5E - 15000 = E$$

$$0.5E = 15000$$

$$E = 30{,}000$$

WN (4) $DOL = \frac{Cont}{EBIT}$

$$2 = \frac{Cont}{30{,}000}$$

$$60{,}000 = Cont$$

P | Q

Sol 3 WN (1) MOS of P = 0.2, | MOS of Q = 0.2 × 1.25 = 0.25

$DOL = \frac{1}{MOS} = \frac{1}{0.2} = $ **5 Times** | $DOL = \frac{1}{0.25} = $ **4 Times**

WN (2)

P | Q

Interest = 1,50,000 | Int = $1,50,000 - \frac{1}{3} \times 150000$ = **1,00,000**

WN (3)

P | Q

DFL = **4 Times** | DFL = 4 × 75% = **3 Times**

WN (4)

P/V ratio = 25% | P/V ratio = 33.33%

VC = 75% | VC = 66.67%

WN (5) $DFL = \frac{EBIT}{EBT}$

$DFL = \frac{EBIT}{EBIT - Int}$

$4 = \frac{E}{E - 1,50,000}$

$4E - 6,00,000 = E$

E = 2,00,000

$DFL = \frac{EBIT}{EBIT - Int}$

$3 = \frac{E}{E - 1,00,000}$

$3E - 3,00,000 = E$

E = 1,50,000

Sol 3 Main Solution

Income Statement

		P		Q
Sales	100%	40,00,000	100%	18,00,000
− VC	75%	−30,00,000	66.67%	−12,00,000
Contribution (WN6)	25%	10,00,000	33.33%	6,00,000
− Fixed Cost	(Bal)	−8,00,000	(Bal)	4,50,000
EBIT		2,00,000		1,50,000
− Interest		−1,50,000		−1,00,000
EBT		50,000		50,000
− Tax 45%		−22500		−22500
EAT		27,500		27,500

WN(6)

P

$DOL = \frac{Cont}{EBIT}$

$5 = \frac{Cont}{2,00,000}$

10,00,000 = Cont

Q

$4 = \frac{Cont}{1,50,000}$

6,00,000 = Cont

Sol ⑥ Income Statement

Particulars	Amt (₹)
Sales	68,00,000
− VC 60%	−40,80,000
Contribution 40%	27,20,000
− FC	−16,32,000
EBIT	10,88,000
−Int (WN) (Debt ×12%)	−393714
EBT	694286
− Tax 30%	−208286
EAT	486000
− Pref Div (1,00,000 × 10%)	−10,000
EAES	476000
÷ No of eq shares	÷1,50,000
EPS	3.173

As per question

If sales ↓ 25%, then EPS ↓ 100%.

$$DCL = \frac{\%\Delta \text{in EPS}}{\%\Delta \text{in Sales}} = \frac{100\%}{25\%} = \boxed{4} \text{ Times}$$

$$DCL = \frac{\text{Contribution}}{EBIT - Int - \frac{\text{Pref Div}}{(1-t)}}$$

$$4 = \frac{27,20,000}{10,88,000 - Int - \left(\frac{10,000}{1-30\%}\right)}$$

$$4 = \frac{27,20,000}{10,88,000 - Int - 14285.71}$$

$$\Rightarrow 4 = \frac{27,20,000}{1073714.29 - Int}$$

$$\Rightarrow 4(1073714.29 - Int) = 27,20,000$$

$$10,73,714.29 - Int = \frac{27,20,000}{4}$$

$$10,73,714.29 - Int = 6,80,000$$

$$393714.29 = Int$$

So, Int is approximately = ₹ 393,714

- Interest amount = ₹ 393,714
- EPS = ₹ 3·173
- Amount of Debt = ₹ 32,80,950

WN

Debt × 12% = Int

Debt × 12% = 393714

Debt = $\frac{393714}{0.12}$ = (₹ 32,80,950)

Alternative Method of Solving Q 6. (By Statement method)

Particulars	Current level	At 25% less Sales
Sales	68,00,000	−25% = 51,00,000
− VC 60%	− 40,80,000	−25% = −30,60,000
Contribution 40%	27,20,000	20,40,000
− FC	−16,32,000	−16,32,000
EBIT	10,88,000	4,08,000
− Int	− 393714	(BB) − 393714
EBT	694286	100% 14286
− Tax 30%	−208286	30% −4286
EAT	486000	70% 10000
− Pref Div	−10,000	−10,000
EAES	476000	0
÷ No of Shares	÷1,50,000	÷1,50,000
EPS	3.173	0

100% − 30% = 70% → $\frac{10000}{0.7}$

Sol(6)

Statement for Calculation of Leverages.

Particulars	Situation A Plan XY	Situation A Plan XM	Situation B Plan XY	Situation B Plan XM
Sales (6000×30)	1,80,000	1,80,000	1,80,000	1,80,000
−VC (6000×20)	−1,20,000	−1,20,000	−1,20,000	−1,20,000
Contribution	60,000	60,000	60,000	60,000
−FC	−20,000	−20,000	−25,000	−25,000
EBIT	40,000	40,000	35,000	35,000
−Interest	−4800	−1200	−4800	−1200
EBT	35,200	38,800	30,200	33,800
DoL = Cont / EBIT	60,000 / 40000 = 1.5	60,000 / 40000 = 1.5	60,000 / 35000 = 1.714	60,000 / 35000 = 1.714
DFL = EBIT / EBT	40000 / 35200 = 1.136	40,000 / 38800 = 1.030	35000 / 30200 = 1.16	35000 / 33800 = 1.035

Sol (10) (i)

Income Statement

Particulars	Amt (₹)
Sales	50,000
− Variable cost 60%	−30,000
Contribution	20,000
− Fixed cost	12,000
EBIT	8,000

$DoL = \frac{\text{Contribution}}{EBIT}$

$= \frac{20,000}{8,000}$

DoL = 2.5

Sol (10) (ii) Networth = ₹25,00,000 = Equity

$\frac{\text{Debt}}{\text{Equity}} = \frac{3}{1}$

$\frac{\text{Debt}}{25,00,000} = \frac{3}{1}$

Debt = 75,00,000

$DFL = \frac{EBIT}{EBIT - Int - \frac{Pref\ Div}{(1-t)}}$

Income Statement

EBIT	20,00,000
− Int (75L × 12%)	−9,00,000
EBT	11,00,000

$DFL = \frac{20,00,000}{11,00,000}$

DFL = 1.82

Sol 11

Income Statement

Particulars	Amount (₹)
Sales (10,000 × ₹500)	50,00,000
− Variable cost (10,000 × ₹200)	−20,00,000
Contribution	30,00,000
− Fixed cost	−25,00,000
Earning Before Int & Tax (EBIT)	5,00,000

If Sale increases by 10%

11,000 × 500 = 55,00,000
11000 × 200 = 22,00,000
33,00,000
− FC −25,00,000
New EBIT = 8,00,000

(a) Degree of operating Leverage (DOL) = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{30,00,000}{5,00,000}$

DOL = 6 Times

(b) If Sales increases by 10%

→ EBIT increased by ₹ 3,00,000
(From ₹ 5,00,000 to ₹ 8,00,000)

→ % Change in EBIT = $\frac{8,00,000 - 5,00,000}{5,00,000} \times 100$ = 60%

Sol 11

Income Statement

Particulars	Amount (₹)
Sales (10,000 × ₹500)	50,00,000
− Variable cost (10,000 × ₹200)	−20,00,000
Contribution	30,00,000
− Fixed cost	−25,00,000
Earning Before Int & Tax (EBIT)	5,00,000

(a) Degree of operating leverage (DOL) = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{30,00,000}{5,00,000}$

DOL = 6 Times

Method (2)

(b) If Sales increases by 10%.

$$DOL = \frac{\%\text{change in EBIT}}{\%\text{change in Sales}}$$

$$6 = \frac{\%\text{ change in EBIT}}{10\%}$$

60% = % change in EBIT

New EBIT = 5,00,000 + 60% = ₹8,00,000

Sol 12

Sale Price = ₹14
− VC = ₹9
Cont Pu = ₹5

Operating BEP = FC / Cont Pu (in unit)

2000 units = FC / 5

₹10,000 = FC

	At 2500 units	At 3000 units
Sales	2500 × 14 =	3000 × 14 =
− VC	2500 × 9 =	3000 × 9 =
Contribution	2500 × 5 = ₹12500	3000 × 5 = ₹15000
− FC	− ₹10,000	− ₹10,000
EBIT	₹2,500	₹5,000

DoL = Cont / EBIT

₹12500 / ₹2500 = 5 Times

15000 / 5000 = 3 Times

Yes there is difference in DoL at both levels

As Sales increases from 2500 units to 3000 units then DoL reduces from 5 Times to 3 Times, it shows that when a business has higher Sales, it has lower operating risk.

Sol 13 @

Income Statement

Particulars	Present level	Proposed level
		Units
Sales	5000 × ₹100 = ₹5,00,000	7000 × 95 = 6,65,000
− Variable cost	5000 × ₹50 (VC) (B/F) = ₹2,50,000	7000 × (50−10) = −2,80,000 (VC p.u. 55)
Contribution	(50) ₹2,50,000	3,85,000
− Fixed cost	− ₹2,00,000	2,00,000 + 50000 = 2,50,000
EBIT	₹50,000	135000
− Interest	− ₹0	4,00,000 × 10% = −₹40,000
EBT	₹50,000	95,000

Capital		
Equity	₹5,00,000	Equity ₹5,00,000
Debt =	₹0	10% Debt = ₹4,00,000

(a) Yes, the Company should make these changes because profits have increased by ₹45000. (95000 − 50000)

(b) Degree of operating leverage = Contribution / EBIT

Present level

$DOL = \frac{250000}{50000} = 5$ Times

Proposed level

$DOL = \frac{385000}{135000} = 2.85$ Times

(c) Overall Breakeven point.

$$\text{Overall BEP} = \frac{FC + Int + \frac{PD}{(1-t)}}{\text{Cont p.u}} \quad \text{(in units)}$$

Overall BEP (units) $= \frac{2,00,000+0}{50}$

$= 4000$ units

Overall BEP (in ₹) $= 4000 \times ₹100$

$= ₹4,00,000$

Overall BEP (units) $= \frac{2,50,000+40,000}{55}$

$= 5273$ units

Overall BEP (in ₹) $= 5273 \times 95$

$= ₹500935$

Sol 14 (i)

Statement for Degree of Operating Leverage

Firm	% Δ in Sales	% Δ in EBIT	DOL = % Δ in EBIT / % Δ in Sales
PQR Ltd	27%	25%	$\frac{25\%}{27\%} = 0.926$
RST Ltd	25%	32%	$\frac{32}{25} = 1.28$
TUV Ltd	23%	36%	$\frac{36}{23} = 1.565$
WXY Ltd	21%	40%	$\frac{40}{21} = 1.905$

Comment: DOL measures operating risk. So, we can say that Risk of WXY > Risk of TUV > Risk of RST > Risk of PQR.

(ii)

Firm	DOL	Beta
PQR Ltd	0.926	1.00
RST Ltd	1.28	1.15
TUV Ltd	1.565	1.30
WXY Ltd	1.905	1.40

DOL measures operating risk.
Beta measures risk from external viewpoint.
As both measure risk so they are directly related.

⇒ If a company has high leverage it usually has high Beta.

Sol 15)

Particulars	N	S	D
Sales (17500×85)	14,87,500		
- VC (17500×38)	6,65,000		
Contribution	8,22,500		
- FC	−4,00,000		
EBIT	4,22,500		
− Interest	−1,25,000		
EBT	2,97,500		

$DOL = \frac{Cont}{EBIT}$ $\frac{822500}{422500} = 1.946$

$DFL = \frac{EBIT}{EBT}$ $\frac{422500}{297500} = 1.420$

$DCL = \frac{Cont}{EBT}$ $\frac{822500}{297500} = 2.765$

Sol 16 Income Statement

Particulars	Amt (7 in lakhs)
Contribution	17,325
− FC	−1575
EBIT	15,750
− Interest (BIS)	8750
EBT	7,000 ·

Step① $DCL = \frac{\text{Contribution}}{EBIT - Int - \frac{Pref\ div}{(1-t)}} = \frac{\text{Contribution}}{EBT} = \frac{17325}{7000}$

$DCL = 2.475$

Step② $DCL = \frac{\%\ \text{change in EPS}}{\%\ \text{change in sales}}$

$2.475 = \frac{\%\ \text{change in EPS}}{5\%}$

$12.375\% = \%\ \text{change in EPS}$

Sol 17

Sales =		100 lakh
− Variable cost		73,00,000 (B/S)
Contribution =		27,00,000
− FC		− 4,50,000
EBIT =		22,50,000
− Int =		− 10,00,000
EBT =		12,50,000

(i) Financial Leverage = 1.8

(ii) FC = 4,50,000

(iii) P/V ratio = $\frac{\text{Cont}}{\text{Sales}} \times 100$ = 27%

WN 1

$DOL \times DFL = DCL$

$1.2 \times DFL = 2.16$

$DFL = 1.8$

WN 2

$DFL = \frac{EBIT}{EBT} \Rightarrow 1.8 = \frac{EBIT}{EBIT - 10\ lakh}$

$1.8\,EBIT - 18L = EBIT$

$EBIT = ₹\,22.5L$

WN 3

$DOL = \frac{Cont}{EBIT}$

$1.2 = \frac{Cont}{22.5L}$

$Cont = 27L$

Q#19

Income Statement

Particulars	Amt (₹)
Sales	75,00,000
−VC	−48,00,000
Contribution	33,00,000
− FC	−6,00,000
EBIT	27,00,000
− Int (45L×9%)	−4,05,000
EBT	22,95,000

CON

BIS

Equity	55,00,000
9% Debt	45,00,000
	1,00,00,000

1,00,00,000

(iii) Asset Turnover ratio = Sales / Total Assets

Fore Firm

Asset Turnover Ratio = 75,00,000 / 1,00,00,000 = 0.75 Times

Industry

Asset Turnover ratio = 3 Times

The firm has lower asset Turnover ratio because its Asset Turnover is only 0.75 which is very low as compared to industry having '3'.

(iv) DOL = Cont / EBIT = 33,00,000 / 27,00,000 = 1.222

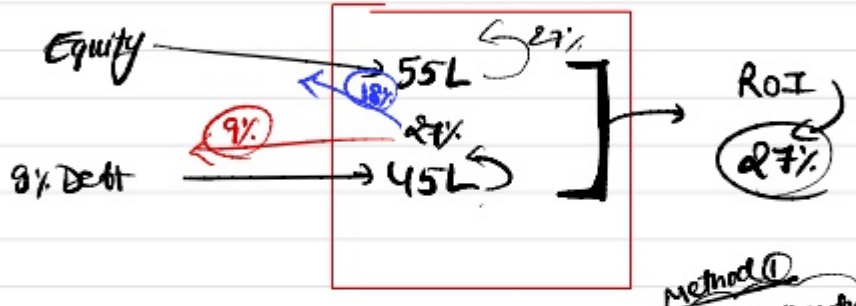
DFL = EBIT / EBT = 27,00,000 / 22,95,000 = 1.176

DCL = Cont / EBT = 33,00,000 / 22,95,000 = 1.438

Sol 19

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

(ii) Interest rate on debt = 9%
Return on Investment = 27%
Yes, this firm has favourable financial leverage, because ROI > Int rate.



Sol 19 (iv)

Method ① Unitary Method

Particulars	Present	Proposed
Sales	75,00,000	50,00,000
− VC	− 42,00,000	$\left(\frac{42}{75} \times 50\right)$ = − 28,00,000
Contribution	33,00,000	22,00,000
− FC	− 6,00,000	− 6,00,000
EBIT	27,00,000	16,00,000

Alternative Method to find VC

Step ① Calculate VC%

$\frac{VC}{Sales} = \frac{42,00,000}{75,00,000} \times 100 = 56\%$

Step ② Calculate New VC

50,00,000 × 56% = 28,00,000

Sol 19(vi) Calculate Sales at which EBT = 0

Income Statement

Sales	2284091	100%
−VC	(BE) − 1279091	−56%
Contribution	1005000	44%
− Fixed cost	−600000	
EBIT	405000	
− Interest (4500000 × 9%)	−405000	
EBT	= 0	

$\frac{1005000}{44} \times 100$

So, At Sale level of ₹ 2284091 the EBT = 0.

Solⁿ (i) $DCL = \frac{\%\text{ chn EPS}}{\%\text{ chn in Sales}}$

Calculation of DCL

Company	DCL
Nokia	$\frac{50}{10} = 5$
Motorola	$\frac{80}{20} = 4$
Samsung	$\frac{75}{25} = 3$
Blackberry	$\frac{75}{30} = 2.5$

(ii) $DOL \times DFL = DCL$. , So, $\boxed{DFL = \frac{DCL}{DOL}}$

Company	$DFL = \frac{DCL}{DOL}$
Nokia	$\frac{5}{2.5} = 2$
Motorola	$\frac{4}{2} = 2$
Samsung	$\frac{3}{2.25} = 1.33$
Blackberry	$\frac{2.5}{1.2} = 2.08$

Soldo (iii)

Company	DCL	Beta
Nokia	5	1.4
Motorola	4	1.27
Samsung	3	1.18
Blackbody	2.5	1.10

- DCL measures combined risk of fixed cost ona business. (both operating and financial)
- Beta measures risk of a company from external view point

As both Beta and DCL measure risk, they usually are directly related to each other.

⇒ A company having higher DCL will have higher Beta also!

$$DOL = \frac{\%\text{ change in EBIT}}{\%\text{ change in Revenue}}, \quad DCL = \frac{\%\text{ change in EPS}}{\%\text{ change in Revenue}}$$

Sol#1

Firm	DOL	DCL
M	$DOL = \frac{26\%}{28\%} = 0.928$	$DCL = \frac{32\%}{28\%} = 1.142$
N	$\frac{34\%}{27\%} = 1.26$	$= 0.9629$
P	1.52	$= 0.92$
Q	1.87	$= 1.1739$
R	1.6	$= 1.12$

Sol 22 cont (i)

B/S

80,000 → 80,000

Asset Turnover ratio = $\frac{Sales}{Total\ Assets}$

$2 = \frac{Sales}{80{,}000}$

₹1,60,000 = Sales

Statement for Calculation of Leverages

Particulars	a A	a B	a C	b A	b B	b C	c A	c B	c C
Sales	1,60,000	1,60,000	1,60,000	1,60,000	1,60,000				
−VC 60%	−96000	−96000	−96000	−96000	−96000				
Cont	64000	64000	64000	64000	64000				
−FC	−4000	−4000	−4000	−6000	−6000				
EBIT	60,000	60,000	60,000	58000	58000				
−Int	−2000	−4000	−6000	−2000	−4000	−6000			

Sol 24

Particulars	P Ltd.	Q Ltd.
(a) DOL = Cont / EBIT	= 300 / 150 = 2 Times	700 / 300 = 2.33 Times
(b) DFL = EBIT / EBT	150 / 100 = 1.5 Times	300 / 200 = 1.5 Times
(c) DCL = Cont / EBT	300 / 100 = 3 Times	700 / 200 = 3.5 Times

Comment :

(a) The operating risk of Q Ltd is more than P Ltd because DOL of Q Ltd is more than P Ltd.

(b) The Financial risk of both companies is same.

(c) The combined risk of Q Ltd is more than P Ltd. because of higher operating risk of Q Ltd. (even when both companies have same financial risk).

Sol(25) (i)

Income Statement

Particulars	At 50,000 units		At 60,000 units	
Sales	50,000 x 12 =	₹6,00,000	60,000 x 12 =	₹7,20,000
− VC	50,000 x 8 =	− ₹4,00,000	60,000 x 8 =	− ₹4,80,000
Contribution	50,000 x 4 =	₹2,00,000	60,000 x 4 =	₹2,40,000
− FC		− ₹1,00,000		− ₹1,00,000
EBIT		₹1,00,000		₹1,40,000
− Int (5L x 10%)		− 50,000		− 50,000
EBT		50,000		90,000
− Tax 50%		− 25000		− 45000
EAT & EFES		₹25000		₹45000
÷ No. of eq. shares		÷ 5000		÷ 5000
EPS		₹5		₹9

(a) % Increase in EPS = $\frac{9-5}{5} \times 100$ = 80% increase

(b) DFL = $\frac{EBIT}{EBT}$ = $\frac{1,00,000}{50,000}$ ⇒ 2 Times | $\frac{1,40,000}{90,000}$ ⇒ 1.556 Times

(c) DOL = $\frac{Cont}{EBIT}$ = $\frac{2,00,000}{1,00,000}$ = 2 Times | = $\frac{240000}{140000}$ = 1.714 Times

Comment → when sales increases from 50,000 to 60,000

⇒ EPS has increased by 80%.

⇒ DOL & DFL have reduced showing lower risk.

Thus we can say that when sales increases, the EPS increases but risk factors (DOL & DFL) reduces.

Sol Q8 (i)

Sales =	₹90,00,000
- VC 60% =	-₹54,00,000
Contribution =	₹36,00,000
- FC	-₹10,00,000
EBIT =	₹26,00,000
- Interest (40L × 12%)	-₹4,80,000
EBT =	₹21,20,000
- Tax 30%	-₹6,36,000
EAT & EAES =	₹14,84,000
÷ No of Equity Shares	÷4,00,000
EPS	₹3.71/share

LONG funds ⇒ ₹80,00,000

Equity: 4,00,000 × ₹10 = ₹40,00,000

Debt @ 12%: ₹40,00,000

Formula for EPS ⇒ $\frac{(EBIT - Interest)(1-t) - Pref\ Div}{Number\ of\ Equity\ Shares}$

$DOL = \frac{Contribution}{EBIT} = \frac{36,00,000}{26,00,000} = 1.385$ Times

$DFL = \frac{EBIT}{EBT} = \frac{26,00,000}{21,20,000} = 1.226$ Times

$DCL = \frac{Contribution}{EBT} = \frac{36,00,000}{21,20,000} = 1.698$ Times

(ii) ① If EPS = ₹4, EBIT = ?

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

$$₹4 = \frac{(EBIT - 4,80,000)(1-30\%) - 0}{4,00,000}$$

$$₹16,00,000 = (EBIT - 480,000)(0.7)$$

$$\frac{₹16,00,000}{0.7} = EBIT - 4,80,000$$

$$₹2285714.29 = EBIT - 4,80,000$$

$$₹\ 2765\ 714.29 = EBIT$$

② EPS = ₹2, EBIT = ?

$$2 = \frac{(EBIT - 480,000)(1-30\%) - 0}{4,00,000}$$

$$\therefore EBIT = ₹1622857.14$$

③ EPS = ₹0, EBIT = ?

$$0 = \frac{(EBIT - 4,80,000)(1-30\%) - 0}{4,00,000}$$

$$0 = (EBIT - 4,80,000)(0.7)$$

$$EBIT = ₹4,80,000$$

Q.27 Income Statement

Particulars	Amt (₹)
Sales (20 × 1,00,000)	20,00,000
− Variable cost (BIS)	−10,00,000
Contribution	10,00,000
− Fixed cost (BIS)	−6,00,000
EBIT	4,00,000
− Int (Debt × 16%)	−1,50,000 (BII)
EBT (con II)	2,50,000
− Tax × 50%	1,25,000
EAT or EAES	1,25,000
÷ No of Equity shares	÷1,00,000
EPS	₹1.25/share

con(I)

$DOL = \frac{\text{Contribution}}{EBIT}$

$2.5 = \frac{10,00,000}{EBIT}$

$EBIT = 4,00,000$

⇒ Debt × 16% = 1,50,000

Debt = ₹9,37,500

WN ② If Sales fall by 25%.
EPS is wiped out (100% ↓)

So, $DCL = \frac{\%\text{ change in EPS}}{\%\text{ change in Sales}} = \frac{100\%}{25\%} =$ 4 Times

$DCL = \frac{\text{Contribution}}{EBT}$

$4 = \frac{10,00,000}{EBT}$

EBT = 2,50,000 Balle Balle !!!

Sol 30

①

Income Statement

Particulars	Amount (₹)
Sales 1,00,000 × 80	80,00,000
− VC 55% of Sales	−44,00,000
Contribution	36,00,000
− Fixed cost	−12,60,000
EBIT	23,40,000
− Interest (54L × 10%)	5,40,000
EBT	18,00,000
− Tax 35%	6,30,000
EAT & EAES	11,70,000
÷ No of equity shares	÷ 5,00,000
EPS	2.34/share

② $DOL = \frac{Cont}{EBIT} = \frac{36,00,000}{23,40,000}$

DOL = 1.538

$DFL = \frac{EBIT}{EBT} = \frac{23,40,000}{18,00,000}$

DFL = 1.3

③ $ROI = \frac{EBIT}{CE}$

$= \frac{23,40,000}{50,00,000 + 54,00,000} \times 100$

(E) (Debt)

$= \frac{2340000}{10400000} \times 100$

= **22.5% (Before Tax)**

(or)

$ROI = \frac{EAT + Int}{CE} \times 100$

$= \frac{11,70,000 + 5,40,000}{104,00,000} \times 100$

= **16.44% (after Tax)**

④ For EBT = 0, we can perform reverse calculations

Sales 100%	40,40,000	(18L × 100 / 45)
− VC 55%	−22,40,000	
Cont 45%	18,00,000	
− FC	12,60,000	
EBIT	5,40,000	
− Int	−5,40,000	↑
EBT	0	

At Sales = ₹40,40,000, EBT = 0.

Q31 Capital

2000 Equity Shares ₹10 = ₹20,000

10% Debentures 100×100 = ₹10,000

Method (I)

Particulars	Present Situation	Proposed Situation
Sales	2000×10 = ₹20,000	+20% = ₹24,000
− Variable cost	2000×7 = −₹14000	+20% = −16800
Contribution	₹6,000	₹7,200
− Fixed cost	−₹1000	−₹1,000
EBIT	₹5000	₹6200
− Int 10,000×10%	−₹1000	−₹1000
EBT	₹4000	₹5200
− Tax×50%	−₹2000	−₹2600
EAT	₹2000	₹2600
÷ Nos equity Shares	÷ 2000	÷ 2000
EPS	₹1/Share	₹1.3/Share

∴ % Increase in EPS = $\left(\frac{1.3-1}{1}\right)\times 100$ = 30%

due to increase in sales.

Method (II)

$$DOL = \frac{Cont}{EBT} = \frac{6000}{4000} = 1.5 \text{ Times}$$

$$DCL = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in Sales}}$$

$$1.5 = \frac{\%\ \text{Increase in EPS}}{20\%\ \text{Increase in Sales}}$$

30% = % Increase in EPS

Sol 35) (i) DoL = 1.4
DCL = 2.8
DoL × DFL = DCL
1.4 × DFL = 2.8
DFL = 2 Times, so, financial leverage = 2 Times

(ii)

Income Statement

Particulars	Amt (₹)
Sales	30,00,000
− VC (BIS)	22,86,000
Contribution (con(i))	7,14,000
− FC	2,04,000
EBIT	5,10,000
− Interest (21.25L × 12%)	−2,55,000
EBT	2,55,000
− Tax 30%	76,500
EAT & EAES	1,78,500
÷ Number of ep. Shares	÷ 1,70,000
EPS	₹1.05/share

con(i)

$DoL = \frac{\text{Contribution}}{EBIT}$

$DoL = \frac{\text{Contribution}}{\text{Contribution} - FC}$

$1.4 = \frac{x}{x - 204000}$

$1.4(x - 204000) = x$

$1.4x - 285600 = x$

$1.4x - x = 285600$

$0.4x = 285600$

$x = \frac{285600}{0.4} = 7,14,000$

- P/V ratio = $\frac{\text{Contribution } \% 100}{\text{Sales}}$

$= \frac{7,14,000 \% 100}{30,00,000}$

P/V ratio = 23.8%

- EPS = ₹1.05/share

Verify

① $DFL = \frac{EBIT}{EBT}$

$DFL = \frac{5,10,000}{2,55,000} = 2$, Verified

② $DCL = \frac{Cont}{EBT} = \frac{7,14,000}{2,55,000}$

DCL = 2.8 verified

(iii) Asset Turnover ratio = $\frac{\text{Sales}}{\text{Total Assets}} = \frac{3900000}{3825000}$ = 0.784 Times

WN	BIS
ESC	17,00,000
DEBT	2125000
	3825000

3825000

Asset Turnover of Industry = 1.5 Times
Asset Turnover of RST Ltd = 0.784 Times

So, we can say that this firm has lower asset turnover than industry.

(iv) To find level of Sales when EBT = 0.

Sales	100%	1928571
− VC	76.2% (BIS)	−
Cont	23.8%	459000
− FC		−204000
EBIT		255000
− Int		−255000
EBT		0

$\frac{459000}{23.8} \times 100 = 1928571$

So, Sales = ₹1928571, when EBT = 0.

Sol 33

Int rate = 10% = I

Tax rate = 40% = t

Financial leverage Ratio = $\frac{\text{Debt}}{\text{Equity}} = \frac{0.6}{1}$

RoI = 20%

RoE = ?

$$RoE = \frac{E}{E}(RoI)(1-t) + \frac{P}{E}(RoI)(1-t) - PD + \frac{D}{E}(RoI - Int)(1-t)$$

$$RoE = \frac{1}{1}(20\%)(1-40\%) + \frac{0.6}{1}(20\% - 10\%)(1-40\%)$$

$$RoE = 12\% + 0.6 \times 6\%$$

$$RoE = 15.6\%$$

Sol (34) (i) Covered in Concept (15)

(ii) DCL = 3, DoL = ?.

EBIT	3.6
− Int	−0.9
EBT	2.7
− Tax	−1.08
EAT	1.62
− Pref Div	−0.26
EAES	1.36

$$DFL = \frac{EBIT}{EBIT - Int - \frac{Pref\ Div}{(1-t)}}$$

$$= \frac{3.6}{3.6 - 0.9 - \frac{0.26}{(1-40\%)}}$$

$$= \frac{3.6}{2.7 - 0.433}$$

$$= 1.589$$

$$DoL \times DFL = DCL$$

$$DoL \times 1.589 = 3$$

$$DoL = \frac{3}{1.589} = 1.89$$

Sol 36

Income Statement

Particulars		A		B		C
Sales	100%	3600	100%	8000	100%	12000
− VC	66⅔%	−2400	75%	−6000	50%	−6000 (BIS)
Contribution	33 1/3%	1200	25%	2000	50%	6000
− FC	(BIS)	−900	(BIS)	−1600	(BIS)	−4000
EBIT		300		400		2000
− Int		−200		−300		−1000
EBT		100		100		1000
− Tax (45%)		−45		−45		−450
EAT		55		55		550

Con ①

$DFL = \frac{EBIT}{EBIT - Int}$

A: $\frac{3}{1} = \frac{x}{x-200}$

$3(x-200) = x$

$3x - 600 = x$

$2x = 600$

$x = 300 = EBIT$

B: $\frac{4}{1} = \frac{y}{y-300}$

$y = 400$

C: $\frac{2}{1} = \frac{z}{z-1000}$

$z = 2000$

Con ②

$DOL = \frac{Cont}{EBIT}$

A: $\frac{4}{1} = \frac{Cont}{300}$

$1200 = Cont$

B: $\frac{5}{1} = \frac{Cont}{400}$

$2000 = Cont$

C: $\frac{3}{1} = \frac{Cont}{2000}$

$6000 = Cont$

Sol 38 ~~Long~~

Total Assets = 2000

So, Total Liab = 2000

Case I	Case II	Case III
D:E	D:E	D:E
0:1	1:4	2:3
Debt = 0	Debt = 400	Debt = 800
Equity = 2000	Equity = 1600	Equity = 1200

RoI = 30%

$\Rightarrow \frac{EBIT}{CE} \times 100 = 30\%$

EBIT = 30% × 2000 = 600

Particulars	Case I	Case II	Case III
EBIT	600	600	600
− Int @15	×0 = − 0	×400 = − 60	×800 = −120
EBT	600	540	480
− Tax @35%	−210	− 189	− 168
EAT & EAES	390	351	312
RoE = $\frac{EAES}{Equity} \times 100$	$\frac{390}{2000} \times 100 = 19.5\%$	$\frac{351}{1600} \times 100 = 21.9\%$	$\frac{312}{1200} \times 100 = 26\%$

It shows favourable impact of trading on equity on RoE.

Sol^n

Income Statement

Particulars	Amount (₹)
Sales	42,00,000
− VC 74.45%	− 31,26,900
Contribution 25.55%	10,73,100
− Fixed cost	3,48,000
EBIT	725100
− Int (18.51 × 11%)	−203500
EBT	521,600
− Tax 35%	−182560
EAT & EAES	339040
÷ No of equity shares	250,000
EPS	1.36

cont'd

$DFL = \frac{EBIT}{EBT} = \frac{725100}{521600}$

$= 1.39$

(As DFL matches with given DFL it is not a case of hidden Interest)

(i) $DOL = \frac{Cont}{EBIT} = \frac{10,73,100}{725100} = 1.48$ Times

(ii) $DCL = \frac{Cont}{EBT} = \frac{10,73,100}{521,600} = 2.057$ Times.

(iii) EPS = ₹1.36 per share (as calculated above)

Q41 Income statement

Particulars	Amt (₹)	
Sales	8400,000	
−VC (B18)	6985,800	
Contribution (27.55%)	2314,200	27.55%
− FC	−696,000	
EBIT	1618,200	
− Int	−444,000	
− Additional Int (B18)	−88160	
EBT	1086,040	
− Tax 40%	−434416	
EAT or EAES	651624	
÷ number of shares	÷500,000	
EPS	1.303	

Given DFL = 1.49

Calculated DFL = $\frac{EBIT}{EBT}$

$= \frac{1618,200}{1618200-444000}$

Calculated DFL = 1.378

Calculated DFL ≠ Given DFL,
Thus there is a case of Missing Interest.

Given DFL = 1.49 = $\frac{EBIT}{EBT}$

$1.49 = \frac{16,18,200}{EBT}$

EBT = 10,86,040

Q144

Income Statement

Particulars		Amount (₹)
Sales		45,00,000
− VC	(B1)	-31,50,000
Contribution		13,50,000
− FC		2,25,000
EBIT		11,25,000
− Int (20LN2%)		-2,40,000
− Additional Int		−603750
EBT	(W.N(i))	281250
− Tax	30%	- 84375
EAT & EAES		196875
÷ number of eq. shares		÷ 385000
EPS		0.511

W.N(i)

$$DoL = \frac{Cont}{EBIT}$$

$$1.2 = \frac{Cont}{Cont - FC}$$

$$1.2 = \frac{C}{C - 225000}$$

$$1.2(C - 225000) = C$$

$$1.2C - 270000 = C$$

$$1.2C - C = 2,70,000$$

$$0.2C = 2,70,000$$

$$C = 1350000.$$

In this question DCL is unwanted information, so lets verify it.

DCL as per our Calculation

$$DCL = \frac{Cont}{EBT} = \frac{1350000}{1125000 - 240000}$$

$$DCL = \frac{13,50,000}{885000}$$

$$DCL = 1.525$$

Given DCL = 4.8

Calculated DCL ≠ Given DCL

So, we have case of hidden Interest

W.N(ii)

$$\text{Given } DCL = \frac{Cont}{EBT}$$

$$4.8 = \frac{1350,000}{EBT}$$

$$EBT = 281,250$$

Sol 44) Main Solution

(i) • P/V ratio = $\frac{\text{Contribution}}{\text{Sales}} = \frac{1350000}{4500000} \times 100 =$ **30%**

• EPS = $\frac{\text{EAES}}{\text{No of Eq Shares}} =$ **0.511**

• DFL = $\frac{DCL}{DOL} = \frac{4.8}{1.2} =$ **4 Times**

Or

$= \frac{EBIT}{EBT} = \frac{11,25,000}{281250} =$ **4 Times**

• Asset Turnover = $\frac{\text{Sales}}{\text{Total Assets}} = \frac{4500000}{5850000} =$ **0.769**

LON	B/S	
Equity	38.5L	
Debt	20L	
	58.5L	58.5L

(ii) Asset Turnover of Industry = 1:1
Asset Turnover of SM Ltd = 0.769

So, Turnover of SM Ltd is lower than industry

(iii) To find level of sales at which EBT = 0.

Method ① By Income statement method.

Particulars		Current	For EBT = 0
Sales	100%	4500000	35,62,500

$\left(\frac{1068750}{30} \times 100\right)$

− VC 70%	−3150000	−2493750 (B/S)
Contribution 30% (P/L)	1350000	1068750
− FC	−225000	−225000
EBIT	1125000	843750
− Int	−240000	−240000
− Additional Int	−603750	−603750
EBT	281250	0

Revenue

So, at Sale level of ₹ 3502500, EBT = 0.

Method ② By using leverage,

If EBT = 0, then EPS = 0, so % EPS = −100%.

$$DCL = \frac{\%\ \Delta \text{ in EPS}}{\%\ \Delta \text{ in Sales}} \Rightarrow 4.8 = \frac{-100\%}{\%\ \Delta \text{ Sales}}$$

$$\%\ \Delta \text{ in Sales} = -20.8333\%$$

So if Sales fall by 20.8333%, then EBT = 0.

original Sales = ₹ 450000 − 20.8333%

New Sales = ₹ 356250

Q43 Income Statements

Particulars		Amount (₹)
Sales	100%	84,00,000
− VC	75%	-63,00,000
Contribution	25%	21,00,000
− FC		7,50,000
EBIT		13,50,000
− Int (30L × 12%) =		3,60,000
Additional Interest		18777
EBT		9,71,223
− Tax 30%	−	2,91,367
EAT & EAES		6,79,856
÷ number of eq. shares		÷ 50,000
EPS		₹13.597

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

$$= \frac{1350,000}{135000 - 360000}$$

$$\Rightarrow \frac{1350,000}{990,000} = 1.36$$

So, Calculated DFL = Given DFL (in question)

Thus we have case of hidden Interest

$$\text{Given } DFL = \frac{EBIT}{EBIT - Int}$$

$$1.39 = \frac{135,000}{135,000 - Int}$$

$$135,000 - Int = \frac{135000}{1.39}$$

$$135,000 - Int = 9,71,223$$

So, Int = ₹ 3,78,777

- 360000 — Int on Bonds
- 18777 — Additional Int (Hidden Int)

(i) $DOL = \frac{Cont}{EBIT} = \frac{21,00,000}{1350000} = 1.56$

(ii) $DCL = \frac{Cont}{EBT} = \frac{21,00,000}{9,71,223} = 2.16$

(iii) $EPS = \frac{EAES}{n} = \frac{679856}{50,000} = ₹13.597$ per share

(iv) Earning Yield $= \frac{EPS}{MPS} = \frac{₹13.597}{₹200} \times 100 = 6.798\%$

Sol 45) COMB Let Sales = 100x

Income Statement		Amt (₹)	
Sales		100x	
−VC		−6,00,000	
Contribution		100x − 6,00,000	
− FC			
EBIT		10x + 30,000	
− Int	(3L × 10%)	− 30,000	
EBT	100%	10x	100%
− Tax	− 50%	− 5x	− 50%
EAT	(Sales × 5%) =	5x	50%

$$DoL = \frac{\text{Contribution}}{EBIT}$$

$$4 = \frac{100x - 6,00,000}{10x + 30,000}$$

$$4(10x + 30,000) = 100x - 6,00,000$$
$$40x + 1,20,000 = 100x - 6,00,000$$
$$7,20,000 = 60x$$
$$12000 = x$$

, So, Sales = $100x = 12,00,000$

Main Solution

Income Statement			
Sales		12,00,000	
− VC		− 6,00,000	
Contribution		6,00,000	
− FC	(Bal)	4,50,000	12000
EBIT		1,50,000	10x + 30,000
− Int		− 30,000	
EBT		1,20,000	
− Tax		− 60,000	
EAT		60,000	

(i) $DFL = \frac{EBIT}{EBT} = \frac{1,50,000}{1,20,000} = 1.25$ Times

(ii) $DCL = \frac{Cont}{EBT} = \frac{6,00,000}{1,20,000} = 5$ Times

(iii) $DCL = \frac{\%\ \Delta in\ EPS}{\%\ \Delta in\ Sales}$

$5 = \frac{\%\ \Delta in\ EPS}{5\% \uparrow}$

$25\% \uparrow = \%\ \Delta in\ EPS.$

Chapter 1: FINANCING DECISIONS- LEVERAGES Solutions

Solution 1:

Income Statement

Particulars	Amount (₹)
Sales	86,00,000
Less: Variable cost (65% of 86,00,000)	55,90,000
Contribution (35% of 86,00,000)	30,10,000
Less: Fixed costs	10,00,000
Earnings before interest and tax (EBIT)	20,10,000
Less: Interest on debt (@ 10% on ₹55 lakhs)	5,50,000
Earnings before tax (EBT)	14,60,000
Tax (40%)	5,84,000
PAT	8,76,000

(i) ROCE (Pre-tax) = $\frac{EBIT}{Capital\ Employed} \times 100 = \frac{EBIT}{Equity + Debt} \times 100$

$\frac{₹20,10,000}{₹(75,00,000+55,00,000)} \times 100$ = **15.46%**

EPS (PAT/ No. of equity shares) **1.168 or ₹1.17**

(ii) ROCE is 15.46% and Interest on debt is 10%. Hence, it has a **favourable financial leverage.**

(iii) Calculation of Operating, Financial and Combined leverages:

Operating Leverage = $\frac{Contribution}{EBIT} = \frac{₹30,10,000}{₹20,10,000}$ = **1.497 (approx)**

Financial Leverage = $\frac{EBIT}{EBT} = \frac{₹20,10,000}{₹14,60,000}$ = 1.377 (approx.)

Combined Leverage = $\frac{Contribution}{EBT} = \frac{₹30,10,000}{₹14,60,000}$ = 2.062 (approx.)

Or, = Operating Leverage × Financial Leverage = 1.497 × 1.377 = 2.06 (approx.)

(iv) Operating leverage is 1.497. So, if sales are increased by 10%.

EBIT will be increased by 1.497 × 10% i.e. 14.97% (approx.)

(v) Since the combined Leverage is 2.062, sales have to drop by 100/2.062 i.e. 48.50% to bring EBT to Zero.

Accordingly, New Sales = ₹86,00,000 × (1 - 0.4850)
= ₹86,00,000 × 0.515
= ₹44,29,000 (approx.)

Hence, at ₹44,29,000 sales level, EBT of the firm will be equal to Zero.

Solution 2:

(1) Preparation of Profit – Loss Statement Working Notes:

Post tax interest	5.60%
Tax rate	30%
Pre tax interest rate = (5.6/70) x 100	8%
Loan amount	₹ 1,25,000
Interest amount = 1,25,000 x 8%	₹ 10,000

Financial Leverage (FL) = $\left(\frac{EBIT}{EBT}\right) = \left(\frac{EBIT}{(EBIT - Interest)}\right) = \left(\frac{EBIT}{(EBIT - 10,000)}\right)$

1.5 = $\frac{EBIT}{(EBIT - 10,000)}$

1.5 EBIT -15000 = EBIT

1.5 EBIT – EBIT = 15,000

0.5 EBIT = 15,000

EBIT = ₹ 30,000

EBT = EBIT – Interest = 30,000 – 10,000 = ₹ 20,000

2. Operating Leverage (OL) = $\frac{Contribution}{EBIT}$

2 = $\frac{Contribution}{30,000}$

Contribution = ₹ 60,000

3. Fixed cost = Contribution – Profit
= 60,000 – 30,000 = ₹ 30,000

4. Sales $= \frac{Contribution}{PV\ Ratio}$
$= \frac{60,000}{30\%}$ = ₹ 2,00,000

5.If PV ratio is 30%, then the variable cost is 70% on sales.
Variable cost = 2,00,000 x 70% = ₹ 1,40,000

Profit – Loss Statement

Particulars	₹
Sales	2,00,000
Less: Variable cost	1,40,000
Contribution	60000
Less: Fixed cost	30,000
EBIT	30,000
Less: Interest	10,000
EBT	20,000
Less: Tax @ 30%	6,000
EAT	14,000

(2) Calculation of no. of Equity shares Market Price per Share (MPS) = ₹140 Price Earnings Ratio (PER) = 10
WKT,
EPS = $\frac{MPS}{PER} = \frac{140}{10}$ = ₹ 14
Total earnings (EAT) = ₹ 14,000
No. of Equity Shares = 14,000 / 14 = 1000

Solution 3:

1. Income Statement

Particulars	Company P (₹)	Company Q (₹)
Sales	40,00,000	18,00,000
Less: Variable Cost	30,00,000	12,00,000
Contribution	10,00,000	6,00,000
Less: Fixed Cost	8,00,000	4,50,000
EBIT	2,00,000	1,50,000
Less: Interest	1,50,000	1,00,000
EBT	50,000	50,000
Tax (45%)	22,500	22,500
EAT	27,500	27,500

Workings:
(i) Margin of Safety
For Company P = 0.20
For Company Q = 0.20 x 1.25 = 0.25
(ii) Interest Expenses
For Company P = ₹ 1,50,000
For Company Q = ₹ 1,50,000 (1-1/3) = ₹ 1,00,000
(iii) Financial Leverage
For Company P = 4
For Company Q = 4 x 75% = 3
(iv) EBIT

For Company A

Financial Leverage = EBIT/(EBIT- Interest)
4 = EBIT/(EBIT- ₹ 1,50,000)
4EBIT – ₹ 6,00,000 = EBIT

3EBIT = ₹ 6,00,000

EBIT = ₹ 2,00,000

For Company B

Financial Leverage = EBIT/(EBIT - Interest)

3 = EBIT/(EBIT – ₹ 1,00,000)

3EBIT – ₹ 3,00,000 = EBIT

2EBIT = ₹ 3,00,000

EBIT = ₹ 1,50,000

(i) Contribution For Company A

Operating Leverage = 1/Margin of Safety

= 1/0.20 = 5

Operating Leverage = Contribution/EBIT

5 = Contribution/₹ 2,00,000 Contribution

= ₹ 10,00,000

For Company B

Operating Leverage = 1/Margin of Safety

= 1/0.25 = 4

Operating Leverage = Contribution/EBIT

4 = Contribution/ ₹1,50,000

Contribution = ₹ 6,00,000

(ii) Sales

For Company A

Profit Volume Ratio = 25%

Profit Volume Ratio = Contribution/Sales x 100

25% = ₹ 10,00,000/Sales

Sales = ₹ 10,00,000/25%

Sales = ₹ 40,00,000

For Company B

Profit Volume Ratio = 33.33%

Therefore, Sales = ₹ 6,00,000/33.33%

Sales = ₹ 18,00,000

Solution 4:

Sources of Capital	Plan I	Plan II	Plan III	Plan IV
Present Equity Shares	13,00,000	13,00,000	13,00,000	13,00,000
New Issue	7,80,000	5,20,000	3,90,000	3,90,000
Equity share capital (₹)	2,08,00,000	1,82,00,000	1,69,00,000	1,69,00,000
No. of Equity shares	20,80,000	18,20,000	16,90,000	16,90,000
12% Long term loan (₹)	-	26,00,000	-	-
9% Debentures (₹)	-	-	39,00,000	-
6% Preference Shares (₹)	-	-	-	39,00,000

Computation of EPS and Financial Leverage

Sources of Capital	Plan I	Plan II	Plan III	Plan IV
EBIT (₹)	52,00,000	52,00,000	52,00,000	52,00,000
Less: Interest on 12% Loan (₹)	-	3,12,000	-	-
Less: Interest on 9% debentures (₹)	-	-	3,51,000	-
EBT (₹)	52,00,000	48,88,000	48,49,000	52,00,000
Less: Tax@ 40%	20,80,000	19,55,200	19,39,600	20,80,000
EAT (₹)	31,20,000	29,32,800	29,09,400	31,20,000
Less: Preference Dividends (₹)	-	-	-	2,34,000
(a) Net Earnings available for equity shares (₹)	31,20,000	29,32,800	29,09,400	28,86,000
(b) No. of equity shares	20,80,000	18,20,000	16,90,000	16,90,000
(c) EPS (a ¸ b) (₹)	1.50	1.61	1.72	1.71
Financial leverage EBIT) (EBT	1.00	1.06	1.07	1.08*

*Financial Leverage in the case of Preference dividend = $\left(\frac{EBIT}{(EBIT - Interest) - (\frac{Do}{(1-t)})}\right)$

$= \left(\frac{52,00,000}{(52,00,000-0) - (\frac{2,34,000}{(1-40)})}\right)$

$= \left(\frac{52,00,000}{48,10,000}\right) = 1.08$

Solution 5:

Income Statement of companies A, B and C

Particulars	A	B	C
Sales	₹15,00,000	₹30,00,000	₹41,66,667
Less: Variable Expenses	₹9,00,000	₹15,00,000	₹16,66,667
Contribution	₹6,00,000	₹15,00,000	₹25,00,000
Less: Fixed Cost	₹4,50,000	₹10,00,000	₹15,00,000
EBIT	₹1,50,000	₹5,00,000	₹10,00,000
Less: Interest	₹1,00,000	₹4,00,000	₹6,00,000
PBT	₹50,000	₹1,00,000	₹4,00,000
Less: Tax @ 30%	₹15,000	₹30,000	₹1,20,000
PAT	₹35,000	₹70,000	₹2,80,000

Working Notes:

(i) Degree of Financial Leverage= $\frac{EBIT}{EBIT - Interest}$

DFL x (EBIT – Int) = EBIT

DFL x EBIT – Int x DFL= EBIT

DFL x EBIT – EBIT =Int x DFL

EBIT(DFL – 1) = Int x DFL

EBIT = $\frac{Int \times DFL}{DFL - 1}$

For A,

EBITA = $\frac{₹1,00,000 \times 3}{3-1}$

EBITA = ₹150000

For B

EBITB = $\frac{₹4,00,000 \times 5}{5-1}$

EBITB = ₹500000

For C

EBITc = $\frac{₹6,00,000 \times 2.5}{2.5-1}$

EBITc =10,00,000

(ii) DOL= $\frac{Contribution}{EBIT}$

Contribution = DOL x EBIT

ContributionA = 4 x ₹1,50,000

ContributionA = ₹6,00,000

ContributionB = 3 x ₹5,00,000

ContributionB = ₹15,00,000

ContributionC = 2.5 x ₹10,00,000

ContributionC = ₹25,00,000

(ii) Fixed Cost = Contribution – EBIT

Fixed CostA= ₹6,00,000 – ₹1,50,000 = ₹4,50,000

Fixed CostB =₹15,00,000 – ₹5,00,000 = ₹10,00,000

Fixed CostC = ₹25,00,000 – ₹10,00,000 = ₹15,00,000

(iii) Contribution= Sales – VC

VC= Sales – Contribution

Sales x VC Ratio= Sales – Contribution

Contribution= Sales – Sales x VC Ratio

Contribution=Sales(1-VCR)

Sales = $\frac{Contribution}{1-VCR}$

SalesA = ₹6,00,000/(1-0.6) = ₹15,00,000

SalesB = ₹15,00,000/(1-0.5) = ₹30,00,000

SalesC = ₹25,00,000/(1-0.4) = ₹41,66,667

Of all the companies, A has the highest degree of Operating Leverage, B has highest degree of Financial Leverage and C is equally leveraged on both Operating and Financial fronts. If we consider combined leverage companies will have the leverages of 12, 15 and 6.25 (by multiplying both operating and financial leverages). This means A is undertaking a higher degree of operating risk while B is undertaking a higher degree of financial risk.

Solution 6:

Break Even Sales = ₹ 6800000×0.75 = ₹ 51,00,000

Income Statement (Amount in ₹)

	Original	Calculation of Interest at BEP (backward calculation)	Now at present level
Sales	68,00,000	51,00,000	68,00,000
Less: Variable Cost	40,80,000	30,60,000	40,80,000
Contribution	27,20,000	20,40,000	27,20,000
Less: Fixed Cost	16,32,000	16,32,000	16,32,000
EBIT	10,88,000	4,08,000	10,88,000
Less: Interest (EBIT-PBT)	?	3,93,714	3,93,714
PBT	?	14,286(10,000/70%)	6,94,286
Less: Tax @ 30%(or PBT-PAT)	?	4,286	2,08,286
PAT	?	10,000(Nil+10,000)	4,86,000
Less: Preference Dividend	10,000	10,000	10,000
Earnings for Equity share holders	?	Nil (at BEP)	4,76,000
Number of Equity Shares	1,50,000	1,50,000	1,50,000
EPS	?	-	3.1733

So Interest=₹3,93,714, EPS=₹3.1733, Amount of debt=3,93,714/12%=₹ 32,80,950

Solution 7:

Income Statement

Particulars	Amount (₹)
Sales	1,11,00,000
Contribution (Sales × P/V ratio)	27,75,000

Less: Fixed cost (excluding Interest)	(7,15,000)
EBIT (Earnings before interest and tax)	20,60,000
Less: Interest on debentures (12% ´ ₹ 60,91,400)	(7,30,968)
EBT (Earnings before tax)	13,29,032
Less: Tax @ 30%	3,98,710
PAT (Profit after tax)	9,30,322

(i) Operating Leverage:

$= \frac{Contribution}{EBIT} = \frac{₹27,75,000}{₹20,60,000} = 1.35$

(ii) Combined Leverage:

= Operating Leverage × Financial Leverage

= 1.35 ´ 1.55 = 2.09 (Approx)

Or,

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

Combined Leverage $= \frac{Contribution}{EBT} = \frac{₹20,60,000}{₹13,29,032} = 2.09$ (Approx)

(iii) Earnings per share (EPS):

$= \frac{PAT}{No.\ of\ shares\ outstanding} = \frac{₹9,30,322}{6,55,000\ equity\ shares} = ₹1.42$

Solution 8:

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

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

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

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

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

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

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 that1 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.

Solution 9:

Contribution per unit = Sales Price Variable Cost = ₹. 30 – ₹. 20 = ₹. 10 p.u.

Total Contribution = (10,000 units × 60%) × ₹. 10p.u = ₹. 60,000

Financial Plan	**XY (In ₹.)**		**XM (In ₹.)**	
	Situation A	**Situation B**	**Situation A**	**Situation B**
Total Contribution	60,000	60,000	60,000	60,000
Less: Fixed cost	(20,000)	(25,000)	(20,000)	(25,000)
EBIT	40,000	35,000	40,000	35,000
	40,000 × 12%	40,000 × 12%	10,000 × 12%	10,000 × 12%
Less: Interest	(4,800)	(4,800)	(1,200)	(1,200)
EBT	35,200	30,200	38,800	33,800
$DOL = \frac{Contribution}{EBIT}$	1.50 times	1.71 times	1.50 times	1.71 times
$DFL = \frac{EBIT}{EBT}$	1.14 times	1.16 times	1.03 times	1.04 times

Solution 10:

(i) **Calculation of Operating Leverage** (In ₹.)

Sales	50,000
Less: Variable cost (60% of sales)	(30,000)
Contribution	20,000
Less: Fixed Costs	(12,000)
Operating Profit (EBIT)	8,000

Operating Leverage = Contribution/ Operating Profit = ₹. 20,000/₹. 8,000 = 2.5 times

(ii) Calculation of Financial Leverage

Calculation of debt and Interest thereon:

(a) Debt = ₹. 25,00,000 × 3 = ₹. 75,00,000

(b) Interest on Debt = ₹. 75,00,000 × 12/100 = ₹. 9,00,000 (In ₹.)

Operating Profit	20,00,000
Less: Interest on debt	(9,00,000)
Profit before tax	11,00,000

Financial Leverage = Operating Profit/Profit before tax = ₹. 20,00,000/₹. 11,00,000 = 1.82 times

Solution 13.

Statement for calculating of DOL

Particulars	Original	Proposed
Equity	5,00,000	5,00,000
Debt	-	4,00,000
Sales	5,00,000	6,65,000
-VC	2,50,000	2,80,000
Contribution	4,50,000	3,85,000
- FC	4,00,000	4,00,000
		50,000
Profit/EBIT	50,000	1,35,000
Int. 4,00,000 x 10%		40,000
EBT		95,000 new

VC pu = 2,50,000/5,000 = 50 – 10 = 40

Advices: Yes profit accept us included in profit

DOL = C/EBIT = 2,50,000/50,000 = 5 times 3,85,000/1,35,000 = 2.85 times

Solution 14:

(i) Degree of operating leverage is computed as % Change in operating Income / % Change in Revenue

Firm	Degree of Operating Leverage	Beta
PQR Ltd.	25/27 = 0.92	1.00
RST Ltd.	32/25 = 1.28	1.15
TUV Ltd.	36/23 = 1.56	1.30
WXY Ltd.	40/21 = 1.90	1.40

(ii) The degree of operating leverage and the beta have a clear relationship. The greater the degree of operating leverage, the more responsive income will be to changes in revenue which are correlated with changes in market movements.

Solution 16:

Percentage change in Earnings per share

DCL = $\frac{\%\ Change\ in\ EPS}{\%\ change\ in\ Sales}$

2.475 = $\frac{\%\ change\ in\ EPS}{5\%}$

∴ % Change in EPS = 12.375%.

Working Notes:

(1) Degree of Operating Leverage (DOL)

$= \frac{Contribution}{EBIT} = \frac{EBIT+Fixed\ Cost}{EBIT}$

$= \frac{15,750+1,575}{15,750}$ = 1.1 times

(2) Degree of Financial Leverage (DFL)

$= \frac{EBIT}{EBT} = \frac{15,750}{7,000}$ = 2.25 times

(3) Degree of combined Leverage (DCL)

= DOL × DFL

= 1.1 × 2.25 times = 2.475 times

Solution 18:

Computation of Degree of Operating leverage, Financial leverage & Combined leverage of two Companies

Particulars	Company A	Company B
Sales revenue (60,000 units × ₹. 30) (15,000 units × ₹. 250)	18,00,000	37,50,000
Less: Variable costs (60,000 units × ₹. 10) (15,000 units × ₹. 75)	(6,00,000)	(11,25,000)
Contribution	12,00,000	26,25,000
Less: Fixed Costs	(7,00,000)	(14,00,000)
EBIT	5,00,000	12,25,000
Less: Interest @ 12% on Debentures	(48,000)	(78,000)
EBT	4,52,000	11,47,000
DOL = $\frac{Contribution}{EBIT}$	(₹.12,00,000/₹. 5,00,000) = 2.4 times	(₹.26,25,000/₹. 12,25,000) = 2.14 times
DFL = $\frac{EBIT}{EBT}$	(₹.5,00,000/₹. 4,52,000) = 1.11 times	(₹.12,25,000/₹. 11,47,000) = 1.07 times
DCL = DOL × DFL	(2.4 × 1.11) = 2.66 times	(2.14 × 1.07) = 2.29 times

Solution 19:

(i) ROI = $\frac{EBIT}{Investment} = \frac{EBIT}{Debt+Equity} = \frac{₹.\ 27,00,000}{₹.\ 1,00,00,000}$ = 0.27 = 27%

(ii) Since the return on investment (27%) is higher than the interest payable on debt at 9%, the firm has a favorable financial leverage.

(iii) Asset Turnover = $\frac{Net\ Sales}{Total\ assets=Total\ Investment}$

Firm's assets turnover is = $\frac{₹.\ 75,00,000}{₹.\ 1,00,00,000}$ = 0.75

The industry average is 3. Hence the firm has low asset leverage.

(iv) Operating leverage = $\frac{Contribution}{EBT} = \frac{₹.\ 33,00,000}{₹.\ 27,00,000}$ = 1.2222 times

Financial leverage = $\frac{EBIT}{EBT} = \frac{₹.\ 27,00,000}{₹.\ 22,95,000}$ = 1.1764 times

Combined leverage = $\frac{Contribution}{EBT} = \frac{₹.\ 33,00,000}{₹.\ 22,95,000}$ = 1.438 times

Or

Combined leverage = Operating leverage × Financial leverage

= 1.2222 × 1.1764 = 1.438 times

(v) If the sales drop to ₹. 50,00,000 from ₹. 75,00,000, the fall is by 33.33%.

Hence EBIT will drop by 40.73% (% Fall in sales × operating leverage)

∴ The new EBIT will be ₹. 27,00,000 × (1 – 40.73%)

= ₹. 16,00,290 or rounded upto ₹. 16,00,000.

(vi) EBT to become zero means 100% reduction in EBT. Since the combined leverage is 1.438 times, sales have to drop by 100/1.438 i.e. 69.54%.

Hence the new sales will be ₹. 75,00,000 × (1 – 69.54%) = ₹. 22,84,500 (approx.)

Working Notes:

Particulars	₹.
Sales Less: Variable cost	75,00,000 (42,00,000)
Contribution Less: Fixed Costs	33,00,000 (6,00,000)
EBIT Less: 9% interest on ₹. 45,00,000	27,00,000 (4,05,000)
EBT	22,95,000

Solution 22.

Total Liability = Debt + Equity

= 60,000 + 20,000 = 80,000

80,000 = Total liability = Total Assets

Assets turnover = Sale/Total Assets

2 = Sales/80,000

Sales = ₹ 1,60,000

Statement for computing leverage

Particulars	(a)A	(a)B	(a)C	(b)A	(b)B
Sales	1,60,000	1,60,000	1,60,000	1,60,000	
(-)VC					
Con. 40%	64,000	64,000	64,000	64,000	
(-)FC	4,000	4,000	4,000	6,000	6,000
EBIT	60,000	60,000	60,000	58,000	
(-) Int	2,000	4,000	6,000	2,000	
EBT	58,000	56,000	54,000	56,000	
C	64,000	64,000	64,000	64,000	
DOL = C/EBIT	60,000	60,000	60,000	58,000	
DOE = EBIT/EBT	60,000/58,000	60,000/56,000	60,000/54,000	58,000/56,000	

Solution 23:

Ratios for the year 2020-21

(i)Inventory turnover ratio

$= \frac{COGS}{Average\ Inventory} = \frac{₹7,38,500}{\frac{(87,500+70,000)}{2}} = 9.4$

(ii)Financial leverage

$= \frac{EBIT}{EBT} = \frac{₹33,250}{₹22,750} = 1.46$

(iii)ROCE $= \frac{EBIT(1-t)}{Average\ Capital\ Employed} = \frac{₹33,250(1-0.3)}{\frac{₹2,10,000+₹1,92,500}{2}} = \frac{₹23275}{₹2,01,250} \times 100 = 11.56\%$

Solution 26:

(i) Earnings per share $= \frac{₹.14.4\ crores}{1\ crore\ equity\ shares} = ₹. 14.40$

(ii) Operating Leverage $= \frac{Contribution}{EBIT} = \frac{₹. 35}{₹. 27} = 1.296$ 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 $= \frac{EBIT}{PBT} = \frac{₹. 27}{₹. 24} = 1.125$ times

The financial leverage is favourable since the debt service obligation is small vis-a-vis EBIT.

(iv) Combined Leverage $= \frac{Contribution}{EBIT} \times \frac{EBIT}{PBT} = 1.296 \times 1.125 = 1.458$ 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-a-vis change in sales.
The leverages – operating, financial and combined are measures of risk.

(v) Current Ratio = $\frac{Current\ Assets}{Current\ Liabilities}$ = $\frac{15}{8}$ = 1.88

Working Notes:
Total Assets = ₹. 40 crores
Total Asset Turnover Ratio = 2.5 times
Hence, Total Sales = 40 × 2.5 = ₹. 100 crores

Computation of Profits after Tax (PAT) (₹. In crores)

Sales	100
Less: Variable operation cost @ 65%	65
Contribution	35
Less: Fixed cost (other than Interest)	8
EBIT	27
Less: Interest on debentures (15% × 20)	3
PBT	24
Less: Tax 40%	9.6
PAT	14.4

Solution 29:

(a) Calculation of Degree of Operating (DOL), Financial (DFL) and Combined leverages (DCL).

DOL = $\frac{₹.3,40,000 - ₹.60,000}{₹.2,20,000}$ = 1.27 times.

DFL = $\frac{₹.2,20,000}{₹.1,60,000}$ = 1.37 times.

DCL = DOL × DFL
= 1.27 × 1.37 = 1.75 times.

(b) Earnings per share at the new sales level.

Particulars	Increase by 20% (₹.)	Decrease by 20% (₹.)
Sales level	4,08,000	2,72,000
Less: Variable expenses	(72,000)	(48,000)
Less: Fixed cost	(60,000)	(60,000)
Earnings before interest and taxes	2,76,000	1,64,000
Less: Interest	(60,000)	(60,000)
Earnings before taxes	2,16,000	1,04,000
Less: Taxes	(75,600)	(36,400)
Earnings after taxes (EAT)	1,40,400	67,600
Number of equity shares	80,000	80,000
EPS	1.75	0.84

Working Notes:
(i) Variable Costs = ₹. 60,000 (Total cost – depreciation)
(ii) Variable Costs at:
(a) Sales level, ₹. 4,08,000 = ₹. 72,000
(b) Sales level, ₹. 2,72,000 = ₹. 48,000

Solution 32:

Computation of Earnings after tax
Contribution = ₹. 60 × 1,000 units = ₹. 60,000
Operating Leverage (OL) × Financial Leverage (FL) = Combined Leverage (CL)
6 × Financial Leverage = 24
∴ Financial Leverage = 4 times
Operating Leverage = $\frac{Contribution}{EBIT}$ = $\frac{₹.60,000}{EBIT}$ = 6

∴ EBIT = $\frac{₹.\ 60,000}{6}$ = ₹. 10,000

Financial Leverage = $\frac{EBIT}{EBT}$ = 4

∴ EBT = $\frac{EBIT}{4} = \frac{₹.\ 10,000}{4}$ = ₹. 2,500

Since tax rate = 30%

Earnings after Tax (EAT) = EBT (1 – 0.30)

= 2,500 (0.70)

∴ Earnings after Tax (EAT) = ₹. 1,750

Solution 33:

ROE = [ROI + {(ROI – r) × D/E}] (1 – t)

= [20% + {(20% – 10%) × 0.60}] (1 – 0.40)

= [20% + 6%] × 0.60 = 15.60%

Solution 35:

(i) Financial leverage

Combined Leverage = Operating Leverage (OL) × Financial Leverage (FL)

2.8 = 1.4 × FL

Financial Leverage = 2

(ii) P/V Ratio and EPS

P/V ratio = $\frac{Contribution}{Sales}$ × 100

Operating leverage = $\frac{Contribution}{Contribution - Fixed\ Cost}$ × 100

1.4 = $\frac{Contribution}{Contribution - ₹.\ 2,04,000}$

1.4 (Contribution – ₹. 2,04,000) = Contribution

1.4 Contribution – ₹. 2,85,600 = Contribution

Contribution = $\frac{₹.\ 2,85,600}{0.4}$

Contribution = ₹. 7,14,000

P/V ratio = $\frac{7,14,000}{30,00,000}$ × 100 = 23.8%

Therefore, P/V Ratio = 23.8%

EPS = $\frac{Profit\ after\ tax}{No.of\ equity\ shares}$

EBT = Sales – VC – FC – Interest

= ₹. 30,00,000 – ₹. 22,86,000 – ₹. 2,04,000 – ₹. 2,55,000 = ₹. 2,55,000

PAT = EBT – Tax

= ₹. 2,55,000 – ₹. 76,500 = ₹. 1,78,500

EPS = $\frac{₹.\ 1,78,500}{₹.\ 1,70,000}$ = ₹. 1.05

(iii) Assets turnover

Assets Turnover = $\frac{Sales}{Total\ Assets} = \frac{₹.30,00,000}{₹.\ 38,25,000}$ = 0.784

0.784 < 1.5 means lower than Industry Turnover.

(iv) $\frac{Operating\ Fixed\ Cost + Interest}{P/V\ Ratio} = \frac{₹.\ 2,04,000 + ₹.\ 2,55,000}{23.8\%}$ = ₹. 19,28,571

Therefore, at 19,28,571 level of sales, the Earnings before Tax of the company will be equal to zero.

Solution 37:

Income Statement **(In ₹.)**

Particulars	Company A	Company B
Sales	91,000 (Contribution + Variable cost)	1,05,000
Less: Variable Cost	56,000	63,000 (60% of 1,05,000)
Contribution	35,000 (EBIT + Fixed Cost)	42,000 (Sales – Variable Cost)
Less: Fixed cost	20,000	31,500 (Bal. Fig)= (Contribution – EBIT)
EBIT	15,000 (EBT + Interest)	10,500

Less: Interest	12,000	9,000
EBT Less: Tax	3,000 900 (30% on EBT)	1,500 (EBIT – Interest) 450 (30% on EBT)
EAT	2,100 (EBT – Tax)	1,050 (EBT – Tax)
	DFL = $\frac{EBIT}{EBT}$ = $\frac{EBT+Interest}{EBT}$ = 5Times. So, $\frac{EBT+₹.\ 12,000}{EBT}$ = 5. EBT = ₹. 3,000	DOL = $\frac{Contribution}{EBIT}$ = $\frac{₹.\ 42,000}{EBIT}$ = 4Times EBIT = ₹. 10,500

Solution 38.

	I	II	III
TA	2,000	2,000	2,000
Debt : Equity	0:1	1:4	2:3
Debt	0	400	800
Equity	2000	1600	1200
ROI = EBIT/CE x 100	30%	30%	30%
EBIT = CE x ROI	600	600	600
(-) interest @ 15%	-	(60)	(120)
EBT	600	540	480
(-) Tax @ 35%			
EAT/EAES	390	351	
ROE = EAES/Equity	390/2,000	351/1,600	312/1,200
	19.5%	21.93%	26%

Here trading on equity is favourable because ROI > Interest Rate. Hence when we increase debt content in the capital, then could earn more on equity funds. Hence ROE has increased with increase in leverage.

Solution 39:

(a) Operating Leverage = $\frac{₹.\ 12,00,000}{₹.\ 2,00,000}$ = 6 times

(b) Financial Leverage = $\frac{₹.\ 2,00,000}{₹.\ 1,00,000}$ = 2 times

(c) Combined Leverage = DOL × DFL = 6 × 2 = 12 times

(d) R.O.E. = $\frac{50,000}{10,00,000}$ × 100 = 5%

(e) Operating Leverage = 6

$6 = \frac{Percentage\ change\ in\ EBIT}{Percentage\ change\ in\ Sales}$

6 × 25% = Percentage change in EBIT

Percentage change in EBIT = 150%

Increase in EBIT = ₹. 2,00,000 × 150% = ₹. 3,00,000

New EBIT = 5,00,000

Working Notes.

Sales	₹. 24,00,000
Less: Variable cost	(₹. 12,00,000)
Contribution	₹. 12,00,000
Less: Fixed cost	(₹. 10,00,000)
EBIT	₹. 2,00,000
Less: Interest	(₹. 1,00,000)
EBT	₹. 1,00,000
Less: Tax (50%)	(₹. 50,000)
EAT	₹. 50,000
No. of equity shares	₹. 10,000
EPS	5

Solution 41.

Computation of Profits after Tax (PAT)

Particulars	Amount (₹)
Sales	84,00,000

Contribution (Sales × P/V ratio)	23,14,200
Less: Fixed cost (excluding Interest)	(6,96,000)
EBIT (Earnings before interest and tax)	16,18,200
Less: Interest on debentures (12% x ₹ 37 lakhs)	(4,44,000)
Less: Other fixed Interest (balancing figure)	(88,160)
EBT (Earnings before tax)	10,86,040*
Less: Tax @ 40%	4,34,416
PAT (Profit after tax)	6,51,624

(i) **Operating Leverage** : $\frac{Contribution}{EBIT} = \frac{₹\ 23,14,200}{₹\ 16,18,200} = 1.43$

(ii) **Combined Leverage**: Operating Leverage × Financial Leverage = 1.43 x 1.49 = 2.13

Or,

Combined Leverage = $\frac{Contribution}{EBIT}$ x $\frac{EBIT}{EBT}$

Combined Leverage = $\frac{Contribution}{EBT} = \frac{₹\ 23,14,200}{₹\ 10,86,040} = 2.13$

Financial Leverage = $\frac{EBIT}{EBT} = \frac{₹\ 16,18,200}{EBT} = 1.49$

So , EBT = $\frac{₹\ 16,18,200}{1.49}$ = ₹ 10,86,040

Accordingly, other fixed interest
= ₹ 16,18,200 – ₹ 10,86,040 – ₹ 4,44,000 = ₹ 88,160

(iii) Earnings per share (EPS) : = $\frac{PAT}{No.\ of\ share\ outstanding} = \frac{₹\ 6,51,624}{5,00,000\ equity\ shares}$ = ₹ 1.30

Solution 42.

Workings:

1. **Contribution** = Sales x P/V ratio= ₹ 15,00,000 x 70% = ₹ 10,50,000
2. **Operating Leverage** = $\frac{Contribution}{Earnings\ before\ Interest\ \&\ Tax\ (EBIT)}$

   Or, 1.4 = $\frac{₹\ 10,50,000}{EBIT}$

   EBIT = ₹ 7,50,000
3. **Financial Leverage** = $\frac{EBIT}{EBT}$

   Or , 1.25 = $\frac{₹\ 7,50,000}{EBT}$

   EBT = ₹ 6,00,000
4. **Fixed Cost** = Contribution – EBIT = ₹ 10,50,000 – ₹ 7,50,000 = ₹ 3,00,000
5. **Interest** = EBIT – EBT = ₹ 7,50,000 – ₹ 6,00,000 = ₹ 1,50,000
6. **Income Statement**

Particulars	Amount (₹)
Sales	15,00,000
Less: Variable cost (30% of ₹ 15,00,000)	4,50,000
Contribution (70% of ₹ 15,00,000)	10,50,000
Less: Fixed costs	3,00,000
Earnings before interest and tax (EBIT)	7,50,000
Less: Interest	1,50,000
Earnings before tax (EBT)	6,00,000

(i) Combined Leverage = $\frac{Contribution}{EBT}$ = $\frac{₹\ 10,50,000}{₹\ 6,00,000}$ = 1.75 times

Or, Combined Leverage = Operating Leverage x Financial Leverage
= 1.4 x 1.25 = 1.75 times
So, if sales is increased by 15% then taxable income (EBT) will be increased by 1.75 × 15% = 26.25%
Verification

Particulars	Amount(₹)
New Sales after 15% increase (₹ 15,00,000 + 15% of ₹15,00,000)	17,25,000
Less: Variable cost (30% of ₹ 17,25,000)	5,17,500
Contribution (70% of ₹ 17,25,000)	12,07,500
Less: Fixed costs	3,00,000
Earnings before interest and tax (EBIT)	9,07,500
Less: Interest	1,50,000
Earnings before tax after change (EBT)	7,57,500

Increase in Earnings before tax (EBT) = ₹ 7,57,500 - ₹ 6,00,000 = ₹ 1,57,500
So, percentage change in Taxable Income (EBT) = $\frac{₹\ 1,57,500}{₹\ 6,00,000}$ x 100 = 26.25%
hence verified

(ii) Degree of Operating Leverage (Given) = 1.4 times
So, if sales is decreased by 10% then EBIT will be decreased by 1.4 × 10% = 14%
Verification

Particulars	Amount (₹)
New Sales after 10% decrease (₹ 15,00,000 - 10% of ₹ 15,00,000)	13,50,000
Less: Variable cost (30% of ₹ 13,50,000)	4,05,000
Contribution (70% of ₹ 13,50,000)	9,45,000
Less: Fixed costs	3,00,000
Earnings before interest and tax after change (EBIT)	6,45,000

Decrease in Earnings before interest and tax (EBIT) = ₹ 7,50,000 - ₹ 6,45,000 = ₹ 1,05,000
So, percentage change in EBIT = $\frac{₹1,05,000}{₹\ 7,50,000}$ x 100 = 14% , hence verified

(iii) Degree of Financial Leverage (Given) = 1.25 times
So, if EBIT increases by 15% then Taxable Income (EBT) will be increased by 1.25 × 15% = 18.75%
Verification

Particulars	Amount (₹)
New EBIT after 15% increase (₹ 7,50,000 + 15% of ₹ 7,50,000)	8,62,500
Less: Interest	1,50,000
Earnings before Tax after change (EBT)	7,12,500

Increase in Earnings before Tax = ₹ 7,12,500 - ₹ 6,00,000 = ₹ 1,12,500
So, percentage change in Taxable Income (EBT) = $\frac{₹\ 1,12,500}{₹\ 6,00,000}$ x 100 = 18.75%, hence verified

Solution 43.
Workings :

1. **Profit volume ratio** = $\frac{Contribution}{Sales}$ x 100

So, 25 = $\frac{Contribution}{₹\ 84,00,000}$ x 100

Contribution = $\frac{₹\ 84,00,000}{100}$ x 25 = ₹ 21,00,000

2. **Financial Leverage** = $\frac{EBIT}{EBT}$

Or , 1.39 = $\frac{₹\ 13,50,000}{EBT}$ (as calculated above)
EBT = ₹ 9,71,223

3. **Income Statement**

Particulars	(₹)
Sales	84,00,000
Less: Variable Cost (Sales - Contribution)	(63,00,000)
Contribution	21,00,000
Less: Fixed Cost	(7,50,000)
EBIT	13,50,000
Less: Interest (EBIT - EBT)	(3,78,777)
EBT	9,71,223
Less: Tax @ 30%	(2,91,367)
Profit after Tax (PAT)	6,79,856

(i) Operating leverage = $\frac{Contribution}{Earnings\ before\ interest\ and\ tax\ (EBIT)} = \frac{₹\ 21,00,000}{₹\ 13,50,000}$ = 1.556 (approx.)

(ii) Combined Leverage = Operating Leverage x Financial Leverage
= 1.556 x 1.39 = 2.163 (approx.)

Or, $\frac{Contribution}{EBT} = \frac{₹\ 21,00,000}{₹\ 9,71,223}$ = 2.162 (approx.)

(iii) Earnings per share (EPS) = $\frac{PAT}{No.\ of\ shares} = \frac{₹\ 6,79,856}{50,000}$ = ₹ 13.597

(iv) Earning Yield = $\frac{EPS}{Market\ Price}$ x 100 = $\frac{₹\ 13.597}{₹\ 200}$ x 100 = ₹ 13.597

Market price ₹ 200

Note: The question has been solved considering Financial Leverage given in the question as the base for calculating total interest expense including the interest of 12% Bonds of ₹ 30 Lakhs. The question can also be solved in other alternative ways.

Solution 44:

(i) Calculation of P/V ratio ,EPS, Financial Leverage and Asset Turnover

Operating leverage = $\frac{Contribution\ (C)}{C - Fixed\ Cost\ (FC)}$ x 100

1.2 = $\frac{C}{C - 2,25,000}$

Or, 1.2 (C – 2,25,000) = C
Or, 1.2 C – 2,70,000 = C
Or, C = $\frac{₹\ 2,70,000}{0.2}$ = ₹ 13,50,000

Now, P/V Ratio = $\frac{Contribution\ (C)}{Sales\ (S)}$ x 100 = $\frac{₹\ 13,50,000}{₹\ 45,00,000}$ x 100 = 30%

Therefore , PV Ratio = 30%

EPS = $\frac{Profit\ after\ tax}{No.\ of\ equity\ shares}$

EBT = Contribution – FC – Interest
= ₹ 13,50,000 - ₹ 2,25,000 - ₹ 2,40,000
= ₹ 8,85,000

PAT = EBT- Tax
= ₹ 8,85,000 - ₹ 2,65,500 = ₹ 6,19,500

EPS = $\frac{₹\ 6,19,500}{₹\ 3,85,000}$ = ₹ 1.61

Combined Leverage = Operating Leverage (OL) x Financial Leverage (FL)
4.8 = 1.2 x FL
Or, FL = 4

Financial Leverage = 4

Assets Turnover = $\frac{Sales}{Total\ Assets}$ = $\frac{₹\ 45,00,000}{₹\ 58,50,000}$ = 0.769

(ii) 0.769 < 1.1. It means lower than industry turnover.

(iii) EBT zero means Contribution = Fixed cost + Interest

Hence Contribution = ₹ 2,25,000 + ₹ 2,40,000 = ₹ 4,65,000

Sales = $\frac{Contribution}{P/V\ Ratio}$ = $\frac{₹\ 4,65,000}{30\%}$ = ₹ 15,50,000

Therefore , at ₹ 15,50,000 level of sales , the Earnings before tax of the company will be equal to zero.

(Note: Question may also be solved in alternative ways.)

Solution 45:

(i) Working Notes

Earnings after tax (EAT)is 5% of sales

Income tax is 50%

So, EBT is 10% of Sales

Since Interest Expenses is ₹ 30,000

EBIT = 10% of Sales + ₹ 30,000..... (Equation i)

Now Degree of operating leverage = 4

So, Contribution / EBIT = 4

Or, Contribution = 4 EBIT

Or, Sales – Variable Cost = 4 EBIT

Or, Sales – ₹ 6,00,000 = 4 EBIT .....(Equation ii)

Replacing the value of EBIT of equation (i) in Equation (ii)

We get, Sales – ₹ 6,00,000 = 4 (10% of Sales + ₹ 30,000)

Or, Sales – ₹ 6,00,000 = 40% of Sales + ₹ 1,20,000

Or, 60% of Sales = ₹ 7,20,000

So, Sales = $\frac{₹\ 7,20,000}{60\%}$ = ₹ 12,00,000

Contribution = Sales – Variable Cost = ₹ 12,00,000 – ₹ 6,00,000 = ₹ 6,00,000

EBIT = $\frac{₹\ 6,00,000}{4}$ = ₹ 1,50,000

Fixed Cost = Contribution – EBIT = ₹ 6,00,000 – ₹ 1,50,000 = ₹ 4,50,000

EBT = EBIT – Interest = ₹ 1,50,000 – ₹ 30,000 = ₹ 1,20,000

EAT = 50% of ₹ 1,20,000 = ₹ 60,000

Income Statement

Particulars	(₹)
Sales	12,00,000
Less: Variable cost	6,00,000
Contribution	6,00,000
Less: Fixed cost	4,50,000
EBIT	1,50,000
Less: Interest	30,000
EBT	1,20,000
Less: Tax (50%)	60,000
EAT	60,000

(ii) **Financial leverage** = $\frac{EBIT}{EBT}$ = $\frac{1,50,000}{1,20,000}$ = 1.25 times

Combined Leverage = Operating leverage x Financial leverage

= 4 x 1.25 = 5 times

Or,

Combined Leverage = $\frac{Contribution}{EBIT}$ x $\frac{EBIT}{EBT}$

Combined Leverage = $\frac{Contribution}{EBIT}$ = $\frac{₹\ 6,00,000}{₹\ 1,20,000}$ = 5 times

(iii) Percentage Change in earnings per shares

Combined Leverage = $\frac{\%\ Change\ in\ EPS}{\%\ Change\ in\ Sales}$ = 5 = $\frac{\%\ Change\ in\ EPS}{5\%}$

5%

% Change in EPS = 25%

Hence, if sales increased by 5%, EPS will be increased by 25%