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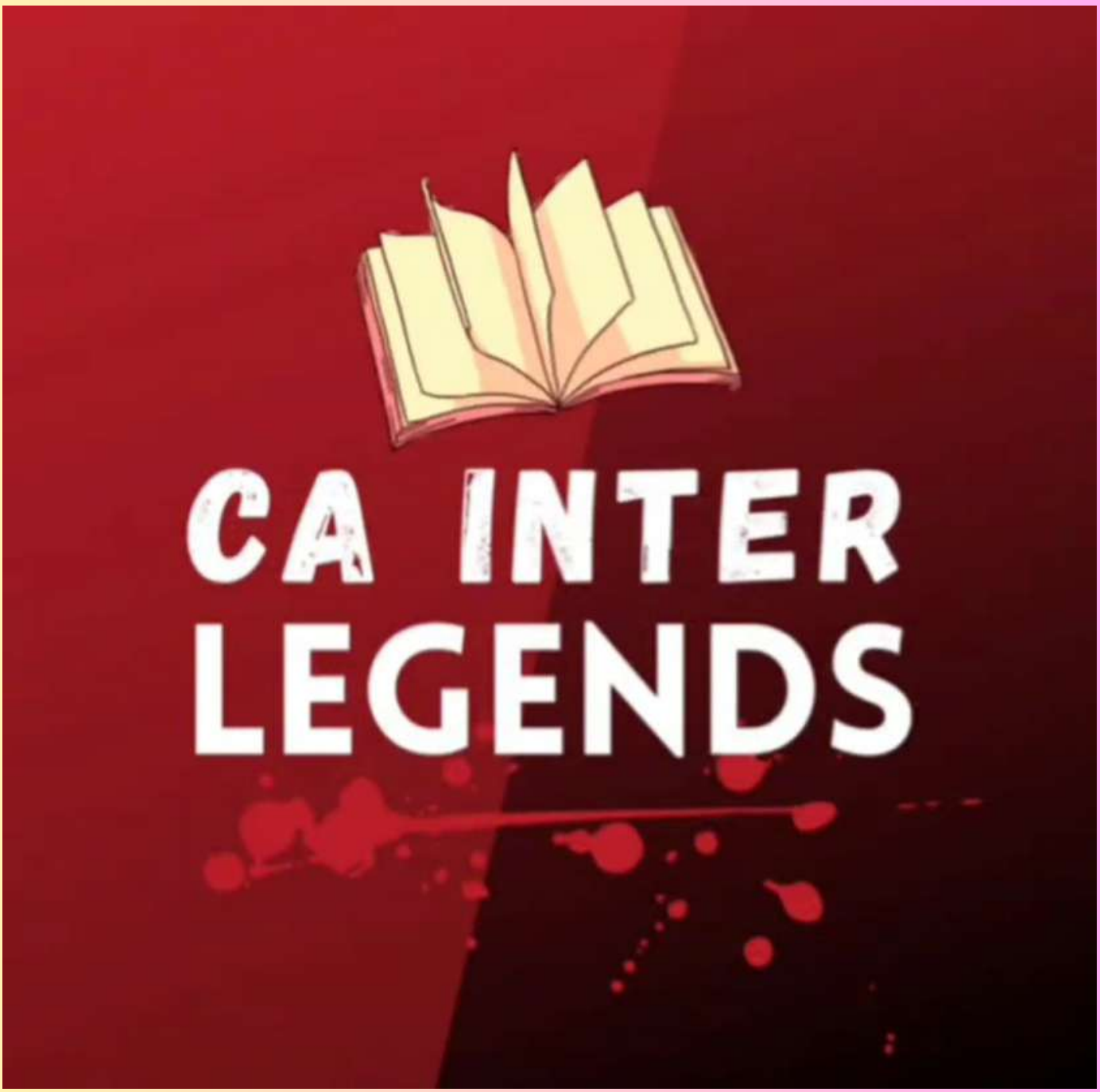

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1 CHAPTER

RATIO ANALYSIS

Q.1 All Ratios | PY May 23

Following information and ratios are given in respect of AQUA Ltd. for the year ended 31st March, 2023:

Current ratio	4.0
Acid test ratio	2.5
Inventory turnover ratio (based on sales)	6
Average collection period (days)	70
Earnings per share	₹ 3.5
Current liabilities	₹ 3,10,000
Total assets turnover ratio (based on sales)	0.96
Cash ratio	0.43
Proprietary ratio	0.48
Total equity dividend	₹ 1,75,000
Equity dividend coverage ratio	1.60

Assume 360 days in a year.
You are required to complete Balance Sheet as on 31stMarch, 2023.

Balance Sheet as on 31stMarch, 2023.

Liabilities	₹	Assets	₹
Equity share capital (₹10 per share)	XXX	Fixed assets	XXX
Reserves & surplus	XXX	Inventory	XXX
Long-term debt	XXX	Debtors	XXX
Current liabilities	3,10,000	Loans & advances	XXX
		Cash & bank	XXX
Total	XXX	Total	XXX

Ans.

(i) Current Ratio = 4

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 4$$

$$\frac{\text{Current Assets}}{3,10,000} = 4$$

Current Assets = ₹ 12,40,000

(ii) Acid Test Ratio = 2.5

$$\frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}} = 2.5$$

$$\frac{12,40,000 - \text{Inventory}}{3,10,000} = 2.5$$

12,40,000 – Inventory = ₹ 7,75,000
Inventory = ₹ 4,65,000

(iii) Inventory Turnover Ratio (on Sales) = 6

$$\frac{\text{Sales}}{\text{Inventory}} = 6$$

$$\frac{\text{Sales}}{4,65,000} = 6$$

Sales = ₹ 27,90,000

(iv) Debtors Collection Period = 70 days
(Debtors / sales) x 360 = 70
(Debtors / 27,90,000) x 360 = 70
Debtors = ₹ 5,42,500

(v) Total Assets Turnover Ratio (on Sales) = 0.96

$$\frac{\text{Sales}}{\text{Total Assets}} = 0.96$$

$$\frac{27,90,000}{\text{Total Assets}} = 0.96$$

Total Assets = ₹ 29,06,250

(vi) Fixed Assets (FA) = Total Assets – Current Assets
= 29,06,250 – 12,40,000
Fixed Assets = ₹ 16,66,250

(vii) Cash Ratio = $\frac{\text{Cash}}{\text{Current Liabilities}} = 0.43$

$$\frac{\text{Cash}}{3,10,000} = 0.43$$

Cash = ₹ 1,33,300

(viii) Proprietary Ratio = $\frac{\text{Proprietary Fund}}{\text{Total Assets}} = 0.48$

$$\frac{\text{Proprietary Fund}}{29,06,250} = 0.48$$

Proprietary Fund = ₹ 13,95,000

(ix) Equity Dividend Coverage Ratio = 1.6 or

$$\frac{EPS}{DPS} = \frac{3.5}{DPS}$$

DPS = ₹ 2.1875

$$DPS = \frac{\text{Total Dividend}}{\text{Number of Equity Shares}}$$

$$2.1875 = \frac{1,75,000}{\text{Number of Equity Shares}}$$

Number of Equity Shares = 80,000
Equity Share Capital = 80,000 x 10 = ₹ 8,00,000
Reserves &Surplus = 13,95,000 - 8,00,000 = ₹ 5,95,000

(x) Loans and Advances = Current Assets - (Inventory + Receivables + Cash & Bank)
= ₹ 12,40,000 - (₹ 4,65,000 + 5,42,500 + 1,33,300) = ₹ 99,200

Balance Sheet as on 31st March 2023

Liabilities	₹	Assets	₹

Equity Share Capital (₹ 10 per share)	8,00,000	Fixed Assets	16,66,250
Reserves & Surplus	5,95,000	Inventory	4,65,000
Long-term debt *(B/F)	12,01,250	Receivables	5,42,500
Current Liabilities	3,10,000	Loans & Advances	99,200
		Cash & Bank	1,33,300
Total	**29,06,250**	**Total**	**29,06,250**

Q.2 All Ratios | PY Nov 22

The following figures are related to the trading activities of M Ltd.

Total assets	₹ 10,00,000
Debt to total assets	50%
Interest cost	10% per year
Direct Cost	10 times of the interest cost
Operating Exp.	₹ 1,00,000

The goods are sold to customers at a margin of 50% on the direct cost
Tax Rate is 30%
You are required to calculate
(i) Net profit margin
(ii) Net operating profit margin
(iii) Return on assets
(iv) Return on owner's equity

Ans.

(i) Computation of Net Profit Margin

Debt = (10,00,000 x 50%) = ₹ 5,00,000

Interest cost = $5,00,000 \times \left(\frac{10}{100}\right)$ = ₹ 50,000

Direct cost = 50,000 x 10 = ₹ 5,00,000
Sales = 5,00,000 x 150% = ₹ 7,50,000

		(₹)
Gross profit = 7,50,000 – 5,00,000	=	2,50,000
Less: Operating expenses	=	1,00,000
EBIT	=	1,50,000
Less: Interest	=	50,000
EBT	=	1,00,000
Less: Tax @ 30%	=	30,000
PAT	=	70,000
Net profit margin	=	$\left(\frac{70,000}{7,50,000}\right) \times 100 = 9.33\%$

(ii) Net Operating Profit margin

Net operating profit margin = $\left(\frac{EBIT}{Sales}\right) \times 100$

= $\left(\frac{1,50,000}{7,50,000}\right) \times 100 = 20\%$

(iii) Return on Assets

Return on Assets = $\left[\left(\frac{PAT + Interest}{Total\ Assets}\right)\right] \times 100$

$= \left[\left(\frac{1,20,000}{10,00,000}\right) \times 100\right] = 12\%$

(OR)

Return on Assets $= \frac{EBIT}{Assets} \times 100$

$= \frac{1,50,000}{10,00,000} \times 100 = 15\%$

(OR)

$= \frac{70,000}{10,00,000} \times 100 = 7\%$

(OR)

$\left[\frac{1,50,000(1-0.3)}{10,00,000}\right] \times 100 = 10.5\%$

(iv) Return on owner's equity

Return $= \left(\frac{PAT}{owner's\ equity}\right) \times 100$

$= \left(\frac{70,000}{5,00,000}\right) \times 100 = 14\%$

Q.3 All Ratios | PY May 22

Following information and ratios are given for W Limited for the year ended 31st March, 2022:

Equity Share Capital of ₹ 10 each	₹ 10 lakhs
Reserves & Surplus to Shareholders' Fund	0.50
Sales / Shareholders' Fund	1.50
Current Ratio	2.50
Debtors Turnover Ratio	6.00
Stock Velocity	2 Months
Gross Profit Ratio	20%
Net Working Capital Turnover Ratio	2.50

You are required to calculate:

(i) Shareholders' Fund
(ii) Stock
(iii) Debtors
(iv) Current liabilities
(v) Cash Balance.

Ans. **(i) Calculation of Shareholders' Fund:**

$\frac{Reserve\ \&\ Surplus}{Shareholders'\ Funds} = 0.5$

$\frac{Reserve\ \&\ Surplus}{Equity\ Share\ Capital + Reserve\ \&\ Surplus} = 0.5$

$\frac{Reserve\ \&\ Surplus}{10,00,000 + Reserve\ \&\ Surplus} = 0.5$

Reserve & Surplus = 5,00,000 + 0.5 Reserve & Surplus
0.5 Reserve & Surplus = 5,00,000
Reserve & Surplus = 10,00,000
Shareholders' funds = 10,00,000 +10,00,000
Shareholders' funds = ₹ 20,00,000

(ii) Calculation of Value of Stock:

$$\frac{\text{Sales}}{\text{Shareholders' Funds}} = 1.5$$

Sales = 1.5 × 20,00,000
Sales = 30,00,000
Gross Profit = 30,00,000 × 20% = 6,00,000
Cost of Goods Sold = 30,00,000 – 6,00,000
= ₹ 24,00,000

Stock velocity = 2 months

$$\frac{\text{Average Stock}}{\text{Cost of Goods Sold}} \times 12 = 2$$

$$\frac{\text{Average Stock}}{24,00,000} \times 12 = 2$$

$$\text{Average Stock} = 24,00,000 \times \frac{2}{12}$$

Average stock = ₹ 4,00,000

(iii) Calculation of Debtors:

Debtors Turnover Ratio = 6

$$\frac{\text{Sales}}{\text{Average Debtor}} = 6$$

$$\frac{30,00,000}{\text{Average Debtor}} = 6$$

Average Debtors = ₹ 5,00,000

(iv) Calculation of Current Liabilities:

Net Working Capital Turnover ratio = 2.5

$$\frac{\text{Sales}}{\text{Current Assets - Current Liabilites}} = 2.5$$

$$\frac{30,00,000}{\text{Current Assets - Current Liabilites}} = 2.5$$

Current Assets – Current Liabilities = 12,00,000 ..... (1)
Current Ratio = 2.5

$$\frac{\text{Current Assets}}{\text{Current Liabilites}} = 2.5$$

Current Assets = 2.5 Current Liabilities .....(2)
From (1) & (2),
2.5 Current Liabilities – Current Liabilities = 12,00,000
1.5 Current Liabilities = 12,00,000
Current Liabilities = ₹ 8,00,000

(v) Calculation of Cash Balance:

Current Assets = 2.5 Current Liabilities

Current Assets = 2.5 (8,00,000)	= 20,00,000
(-) Debtors	(5,00,000)

(-) Stock	(4,00,000)
Cash Balance	**₹ 11,00,000**

Q.4 Prepare B/s | PY Dec 21

Following are the data in respect of ABC Industries for the year ended 31 st March, 2021:

Debt to Total assets ratio	:	0.40
Long-term debts to equity ratio	:	30%
Gross profit margin on sales	:	20%
Accounts receivables period	:	36 days
Quick ratio	:	0.9
Inventory holding period	:	55 days
Cost of goods sold	:	₹ 64,00,000

Liabilities	₹	Assets	₹
Equity Share Capital	20,00,000	Fixed assets	
Reserves & surplus		Inventories	
Long-term debts		Accounts receivable	
Accounts payable		Cash	
Total	50,00,000	Total	

Required:
Complete the Balance Sheet of ABC Industries as on 31st March, 2021. All calculations should be in nearest Rupee. Assume 360 days in a year.

Ans.

Working Notes:

(1) Total liability = Total Assets = ₹ 50,00,000
Debt to Total Asset Ratio = 0.40

$$\frac{\text{Debt}}{\text{Total Assets}} = 0.40$$

Or, $\frac{\text{Debt}}{50,00,000} = 0.40$

So, **Debt** = **20,00,000**

(2) Total Liabilities = ₹ 50,00,000
Equity share Capital + Reserves + Debt = ₹ 50,00,000
So, Reserves =₹ 50,00,000 - ₹ 20,00,000 - ₹ 20,00,000
So, Reserves & Surplus = ₹ 10,00,000

(3) $\frac{\text{Long term Debt}}{\text{Equity Shareholders' Fund}} = 30\%^*$

$\frac{\text{Long term Debt}}{(20,00,000 + 10,00,000)} = 30\%^*$

Long Term Debt = ₹ 9,00,000

(4) So, Accounts Payable = ₹ 20,00,000 – ₹ 9,00,000
Accounts Payable = ₹ 11,00,000

(5) Gross Profit to sales = 20%

Cost of Goods Sold = 80% of Sales = ₹ 64,00,000

Sales = $\frac{100}{80}$ X 64,00,000 = 80,00,000

(6) Inventory Turnover = $\frac{360}{55}$

$\frac{COGS}{Closing\ inventory}$ = $\frac{360}{55}$

$\frac{64,00,000}{Closing\ inventory}$ = $\frac{360}{55}$

Closing inventory = 9,77,778

(7) Accounts Receivable period = 36 days

$\frac{Accounts\ Receivable}{Credit\ sales}$ ×360 = 36

Accounts Receivable = $\frac{36}{360}$ × credit sales

= $\frac{36}{360}$ × 80,00,000 (assumed all sales are on credit)

Accounts Receivable = ₹ 8,00,000

(8) Quick Ratio = 0.9

$\frac{Quick\ Assets}{Current\ liabilities}$ = 0.9

$\frac{Cash + Debtors}{11,00,000}$ = 0.9

Cash + 8,00,000 = ₹ 9,90,000

Cash = ₹ 1,90,000

(9) Fixed Assets = Total Assets- Current Assets = 50,00,000 – (9,77,778+8,00,000+1,90,000) = **30,32,222**

Balance Sheet of ABC Industries as on 31st March 2021

Liabilities	**(₹)**	**Assets**	**(₹)**
Share Capital	20,00,000	Fixed Assets	**30,32,222**
Reserved surplus	**10,00,000**	Current Assets:	
Long Term Debt	**9,00,000**	Inventory	**9,77,778**
Accounts Payable	**11,00,000**	Accounts Receivables	**8,00,000**
		Cash	**1,90,000**
Total	50,00,000	**Total**	**50,00,000**

(***Note**: Equity shareholders' fund represent equity in 'Long term debts to equity ratio'. The question can be solved assuming only share capital as 'equity')

Q.5 Prepare B/s | PY July 21

Masco Limited has furnished the following ratios and information relating to the year ended 3 1st March 2021:

Sales	₹ 75,00,000

Return on net worth	25%
Rate of income tax	50%
Share capital to reserves	6:4
Current ratio	2.5
Net profit to sales (After Income Tax)	6.50%
Inventory turnover (based on cost of goods sold)	12
Cost of goods sold	₹ 22,50,000
Interest on debentures	₹ 75,000
Receivables (includes debtors ₹ 1,25,000)	₹ 2,00,000
Payables	₹ 2,50,000
Bank Overdraft	₹ 1,50,000

You are required to:

(a) Calculate the operating expenses for the year ended 31st March, 2021.

(b) Prepare a balance sheet as on 31st March in the following format:

Liabilities	₹	Assets	₹
Share Capital		Fixed Assets	
Reserves and Surplus		Current Assets	
15% Debentures		Stock	
Payables		Receivables	
Bank Term Loan		Cash	

Ans.

(a) Calculation of Operating Expenses for the year ended 31st March, 2021

Particulars		**(₹)**
Net Profit [@ 6.5% of Sales] Add: Income		4,87,500
Tax (@ 50%)		4,87,500
Profit Before Tax (PBT)		9,75,000
Add: Debenture Interest		75,000
Profit before interest and tax (PBIT)		10,50,000
Sales		75,00,000
Less: Cost of goods sold	22,50,000	
PBIT	10,50,000	33,00,000
Operating Expenses		42,00,000

(b) Balance Sheet as on 31st March, 2021

Liabilities	₹	**Assets**	₹
Share Capital	11,70,000	Fixed Assets	18,50,000
Reserve and Surplus	7,80,000	Current Assets	
15% Debentures	5,00,000	Stock	1,87,500
Payables	2,50,000	Receivables	2,00,000
Bank Overdraft(or Bank Term Loan)	1,50,000	Cash	6,12,500
	28,50,000		28,50,000

Working Notes:

(i) Calculation of Share Capital and Reserves

The return on net worth is 25%. Therefore, the profit after tax of ₹ 4,87,500 should be equivalent to 25% of the net worth.

Net worth $\frac{25}{100}$ = ₹ 4,87,500

Net worth = $\frac{4,87,500 \times 100}{25}$ = ₹ 19,50,000

The ratio of share capital to reserves is 6:4

Share Capital = 19,50,000 x 6/10 = ₹ 11,70,000

Reserves = 19,50,000 x 4/10 = ₹ 7,80,000

(ii) Calculation of Debentures

Interest on Debentures @ 15% (as given in the balance sheet format) = ₹ 75,000

Debentures = $\frac{75,000 \times 100}{15}$ = ₹ 5,00,000

(iii) Calculation of Current Assets

Current Ratio = 2.5

Payables = ₹ 2,50,000

Bank overdraft = ₹ 1,50,000

Total Current Liabilities = ₹ 2,50,000 + ₹ 1,50,000 = ₹ 4,00,000

Current Assets = 2.5 x Current Liabilities = 2.5 □ 4,00,000 = ₹ 10,00,000

(iv) Calculation of Fixed Assets

Particulars	₹
Share capital	11,70,000
Reserves	7,80,000
Debentures	5,00,000
Payables	2,50,000
Bank Overdraft	1,50,000
Total Liabilities	28,50,000
Less: Current Assets	10,00,000
Fixed Assets	18,50,000

(v) Calculation of Composition of Current Assets

Inventory Turnover = 12

$\frac{\text{Cost of goods sold}}{\text{Closing stock}}$ = 12

Closing stock = $\frac{22,50,000}{12}$ = Closing stock = ₹ 1,87,500

Particulars	₹
Stock	1,87,500
Receivables	2,00,000
Cash (balancing figure)	6,12,500
Total Current Assets	10,00,000

Q.6 Prepare B/s | PY Jan 21

From the following information, complete the Balance Sheet given below:

(i) Equity Share Capital : ₹ 2,00,000

(ii) Total debt to owner's equity : 0.75
(iii) Total Assets turnover : 2 times
(iv) Inventory turnover : 8 times
(v) Fixed Assets to owner's equity : 0.60
(vi) Current debt to total debt : 0.40

Balance Sheet of XYZ Co. as on March 31, 2020

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Shares Capital	2,00,000	Fixed Assets	?
Long term Debt	?	Current Assets:	
Current Debt	?	Inventory	?
		Cash	?

Ans.

Balance Sheet of XYZ Co. as on March 31, 2020

Liabilities	**Amount (₹)**	**Assets**	**Amount (₹)**
Equity Share Capital	2,00,000	Fixed Assets	1,20,000
Long-term Debt	90,000	**Current Assets:**	
Current Debt	60,000	Inventory	87,500
		Cash (balancing figure)	1,42,500
	3,50,000		**3,50,000**

Working Notes

1. Total Debt = 0.75 x Equity Share Capital = 0.75 x ₹ 2,00,000 = ₹ 1,50,000
   Further, Current Debt to Total Debt = 0.40.
   So, Current Debt = 0.40 x ₹ 1,50,000 = ₹ 60,000
   Long term Debt = ₹ 1,50,000 - ₹ 60,000 = ₹ 90,000
2. Fixed Assets = 0.60 x Equity Share Capital = 0.60 x ₹ 2,00,000 = ₹ 1,20,000
3. Total Assets to Turnover = 2 times; Inventory Turnover = 8 times
   Hence, Inventory /Total Assets = 2/8 =1/4
   Further, Total Assets = ₹ 2,00,000 + ₹ 1,50,000 = ₹ 3,50,000
   Therefore, Inventory = ₹ 3,50,000/4 = ₹ 87,500
   Cash in Hand = Total Assets – Fixed Assets – Inventory
   = ₹ 3,50,000 - ₹ 1,20,000 - ₹ 87,500 = ₹ 1,42,500

Q.7 Return on Asset | PY Nov 20

Following information relates to RM Co. Ltd.

	(₹)
Total Assets employed	10,00,000
Direct Cost	5,50,000
Other Operating Cost	90,000

Goods are sold to the customers at 150% of direct costs.
50% of the assets being financed by borrowed capital at an interest cost of 8% per annum. Tax rate is 30%.
You are required to calculate :
(i) Net profit margin
(ii) Return on Assets
(iii) Asset turnover
(iv) Return on owners' equity

Ans. **Computation of net profit:**

Particulars	(₹)
Sales (150% of ₹ 5,50,000)	8,25,000
Direct Costs	5,50,000
Gross profit	2,75,000
Other Operating Costs	90,000
Operating profit (EBIT)	1,85,000
Interest changes (8% of ₹ 5,00,000)	40,000
Profit before taxes (EBT)	1,45,000
Taxes (@ 30%)	43,500
Net profit after taxes (EAT)	**1,01,500**

(i) Net profit margin (After tax) = $\frac{\text{Profit after taxes}}{\text{Sales}} = \frac{1,01,500}{8,25,000}$ = **0.12303 or 12.303%**

Net profit margin (Before tax)= $\frac{\text{Profit before taxes}}{\text{Sales}} = \frac{1,45,000}{8,25,000}$ = **0.17576 or 17.576%**

(ii) Return on assets = $\frac{\text{EBIT}(1-T)}{\text{Total Assets}} = \frac{1,85,000(1-0.3)}{10,00,000}$ = **0.1295 or 12.95%**

(iii) Asset turnover = $\frac{\text{Sales}}{\text{Assets}} = \frac{8,25,000}{10,00,000}$ = **0.825 times**

(iv) Return on owner's equity = $\frac{\text{Profit after taxes}}{\text{Owners equity}} = \frac{`1,01,500}{50\% \times `10,00,000}$ = **0.203 or 20.3%**

Q.8 ROCE | PY Nov 19

Following information has been gathered from the books of Tram Ltd. the equity shares of which is trading in the stock market at ₹ 14.

Particulars	Amount (₹)
Equity Share Capital (face value ₹ 10)	10,00,000
10% Preference Shares	2,00,000
Reserves	8,00,000
10% Debentures	6,00,000
Profit before Interest and Tax for the year	4,00,000
Interest	60,000
Profit after Tax for the year	2,40,000

Calculate the following:
(i) Return on Capital Employed
(ii) Earnings per share
(iii) PE ratio

Ans. **(i) Calculation of Return on capital employed (ROCE)**

Capital employed = Equity Shareholders' funds + Debenture + Preference shares
= ₹ (10,00,000 + 8,00,000 + 6,00,000 + 2,00,000)

= ₹ 26,00,000

Return on capital employed [ROCE-(Pre-tax)] $= \frac{PBIT}{Capital\ Employed} \times 100$

$= \frac{4,00,000}{26,00,000} \times 100$

= 15.38% (approx.)

Return on capital employed [ROCE-(Post-tax)] $= \frac{2,40,000}{26,00,000} \times 100$

= 9.23% (approx.)

(ii) Calculation of Earnings per share

$$\text{Earnings per share} = \frac{\text{Earnings available to equity shareholders}}{\text{No of equity shares}}$$

$$\frac{\text{Profit after tax - preference Dividend}}{\text{No of equity shares}}$$

$$\frac{(2,40,000 - 20,000)}{1,00,000} = ₹\ 2.20$$

(iii) Calculation of PE ratio

$$PE = \frac{\text{Market Price per Share (MPS)}}{\text{Earning per Shares (EPS)}}$$

$$= \frac{14}{2.20} = 6.364 \text{ (approx.)}$$

Q.9 Fixed Assets | PY May 19

Following figures and ratios are related to a company Q Ltd. :

(i)	Sales for the year (all credit)	₹ 30,00,000
(ii)	Gross Profit ratio	25 per cent
(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1 : 1
(vi)	Current ratio	1. 5 : 1
(vii)	Receivables (Debtors) collection period	2 months
(viii)	Reserves and surplus to share capital	0.6 : 1
(ix)	Capital gearing ratio	0.5
(x)	Fixed assets to net worth	1.20 : 1

You are required to calculate :

Closing stock, Fixed Assets, Current Assets, Debtors and Net worth.

Ans. **(i) Calculation of Closing Stock:**

Cost of Goods Sold = Sales – Gross Profit (25% of Sales)

= ₹ 30,00,000 – ₹ 7,50,000

= ₹ 22,50,000

Closing Stock = Cost of Goods Sold / Stock Turnover

= ₹ 22,50,000/6
= ₹ 3,75,000

(ii) Calculation of Fixed Assets:

Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
= ₹ 22,50,000/1.5
= ₹ 15,00,000

(iii) Calculation of Current Assets:

Current Ratio = 1.5 and Liquid Ratio = 1
Stock = 1.5 – 1 = 0.5
Current Assets = Amount of Stock × 1.5/0.5
= ₹ 3,75,000 × 1.5/0.5 = ₹ 11,25,000

(iv) Calculation of Debtors:

Debtors = Sales × Debtors Collection period /12
= ₹ 30,00,000 × 2 /12
= ₹ 5,00,000

(v) Calculation of Net Worth:

Net worth = Fixed Assets /1.2
= ₹ 15,00,000/1.2
= ₹ **12,50,000**

Q.10 COGS | PY Nov 18

The following is the information of XML Ltd. relate to the year ended 31-03-2018 : Gross Profit 20% of Sales

Net Profit	10% of Sales
Inventory Holding period	3 months
Receivable collection period	3 months
Non-Current Assets to Sales	1 : 4
Non-Current Assets to Current Assets	1 : 2
Current Ratio	2 : 1
Non-Current Liabilities to Current Liabilities	1 : 1
Share Capital to Reserve and Surplus	4 : 1
Non-current Assets as on 31st March, 2017	₹ 50,00,000

Assume that:
(i) No change in Non-Current Assets during the year 2017-18
(ii) No depreciation charged on Non-Current Assets during the year 2017-18.
(iii) Ignoring Tax
You are required to Calculate cost of goods sold, Net profit, Inventory, Receivables and Cash for the year ended on 31st March, 2018

Ans. **Workings**

$$\frac{\text{Non Current Assets}}{\text{Curent Assets}} = \frac{1}{2}$$

Or $\frac{50,00,000}{\text{Curent Assets}} = \frac{1}{2}$

So, Current Assets = ₹ 1,00,00,000

Now further,

$$\frac{\text{Non Current Assets}}{\text{Sales}} = \frac{1}{4}$$

Or $\frac{50,00,000}{\text{Sales}} = \frac{1}{4}$

So, Sales = ₹ 2,00,00,000

Calculation of Cost of Goods sold, Net profit, Inventory, Receivables and Cash:

(i) Cost of Goods Sold (COGS):

Cost of Goods Sold = Sales- Gross Profit

= ₹ 2,00,00,000 – 20% of ₹ 2,00,00,000

= ₹ 1,60,00,000

(ii) Net Profit = 10% of Sales = 10% of ₹ 2,00,00,000

= ₹ 20,00,000

(iii) Inventory:

$$\text{Inventory Holding Period} = \frac{12 \text{ Months}}{\text{Inventory Turnover Ratio}}$$

Inventory Turnover Ratio = 12/ 3 = 4

$$4 = \frac{COGS}{\text{Average Inventory}}$$

$$4 = \frac{1,60,00,000}{\text{Average Inventory}}$$

Average or Closing Inventory =₹ 40,00,000

(iv) Receivables :

$$\text{Receivable Collection Period} = \frac{12 \text{ Months}}{\text{Receivables Turnover Ratio}}$$

$$\text{Or Receivables Turnover Ratio} = 12/3 = 4 = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

$$\text{Or } 4 = \frac{2,00,00,000}{\text{Average Accounts Receivable}}$$

So, Average Accounts Receivable/Receivables =₹ 50,00,000/-

(v) Cash:

Cash* = Current Assets* – Inventory- Receivables

Cash = ₹ 1,00,00,000 - ₹ 40,00,000 - ₹ 50,00,000

= ₹ 10,00,000

(it is assumed that no other current assets are included in the Current Asset)

Q.11 Prepare B/s | PY May 18

The accountant of Moon Ltd. has reported the following data:

Gross profit	₹ 60,000
Gross Profit Margin	20 per cent
Total Assets Turnover	0.30:1
Net Worth to Total Assets	0.90:1
Current Ratio	1.5:1
Liquid Assets to Current Liability	1:1
Credit Sales to Total Sales	0.80:1
Average Collection Period	60 days

Assume 360 days in a year

You are required to complete the following:

Balance Sheet of Moon Ltd.

Liabilities	₹	*Assets*	₹
Net Worth		*Fixed Assets*	
Current Liabilities		*Stock*	
		Debtors	
		Cash	
Total Liabilities		*Total Assets*	

Ans.

Preparation of Balance Sheet

Working Notes:

Sales = Gross Profit / Gross Profit Margin
= 60,000 / 0.2 = ₹ 3,00,000

Total Assets = Sales / Total Asset Turnover
= 3,00,000 / 0.3 = ₹ 10,00,000

Net Worth = 0.9 X Total Assets
= 0.9 X ₹ 10,00,000 = ₹ 9,00,000

Current Liability = Total Assets – Net Worth
= ₹ 10,00,000 – ₹ 9,00,000
= ₹ 1,00,000

Current Assets = 1.5 x Current Liability
= 1.5 x ₹ 1,00,000 = ₹ 1,50,000

Stock = Current Assets – Liquid Assets
= Current Assets – (Liquid Assets / Current Liabilities =1)
= 1,50,000 – (LA / 1,00,000 = 1) = ₹ 50,000

Debtors = Average Collection Period X Credit Sales / 360
= 60 x 0.8 x 3,00,000 / 360 = ₹ 40,000

Cash = Current Assets – Debtors – Stock
= ₹ 1,50,000 – ₹ 40,000 – ₹ 50,000
=₹ 60,000

Fixed Assets = Total Assets – Current Assets
= ₹ 10,00,000 – ₹ 1,50,000
= ₹ 8,50,000

Balance Sheet

Liabilities	₹	Assets	₹
Net Worth	9,00,000	Fixed Assets	8,50,000
Current Liabilities	1,00,000	Stock	50,000
		Debtors	40,000
		Cash	60,000
Total liabilities	10,00,000	Total Assets	10,00,000

Q.12 Calculate Ratios | RTP Nov 19

From the following table of financial ratios of Prabhu Chemicals Limited, comment on various ratios given at the end:

Ratios	2021	2022	Average of Chemical Industry
Liquidity Ratios			
Current ratio	2.1	2.3	2.4
Quick ratio	1.4	1.8	1.4
Receivable turnover ratio	8	9	8
Inventory turnover	8	9	5
Receivables collection period	46 days	41 days	46 days
Operating profitability			
Operating income -ROI	24%	21%	18%
Operating profit margin	18%	18%	12%
Financing decisions			
Debt ratio	45%	44%	60%
Return			
Return on equity	26%	28%	18%

COMMENT on the following aspect of Prabhu Chemicals Limited

(i) Liquidity

(ii) Operating profits

(iii) Financing

(iv) Return to the shareholders

Ans.

Ratios	Comment
Liquidity	Current ratio has improved from last year and matching the industry average. Quick ratio also improved than last year and above the industry average. The reduced inventory levels (evidenced by higher inventory turnover ratio) have led to better quick ratio in FY 2022 compared to FY 2021. Further the decrease in current liabilities is greater than the collective decrease in inventory and debtors as the current ratio have increase from FY2021 to FY 2022.

Operating Profits	Operating Income-ROI reduced from last year, but Operating Profit Margin has been maintained. This may happen due to decrease in operating cost. However, both the ratios are still higher than the industry average.
Financing	The company has reduced its debt capital by 1% and saved earnings for equity shareholders. It also signifies that dependency on debt compared to other industry players (60%) is low.
Return to the shareholders	Prabhu's ROE is 26 per cent in 2021 and 28 per cent in 2022 compared to an industry average of 18 per cent. The ROE is stable and improved over the last year.

Q.13 Find missing figures of B/S | RTP May 23

From the following information, find out missing figures and REWRITE the balance sheet of Mukesh Enterprise.
Current Ratio = 2:1
Acid Test ratio = 3:2
Reserves and surplus = 20% of equity share capital
Long term debt = 45% of net worth Stock turnover velocity = 1.5 months Receivables turnover velocity = 2 months
You may assume closing Receivables as average Receivables. Gross profit ratio = 20%
Sales is ₹ 21,00,000 (25% sales are on cash basis and balance on credit basis) Closing stock is ₹ 40,000 more than opening stock.
Accumulated depreciation is 1/6 of original cost of fixed assets.
Balance sheet of the company is as follows:

Liabilities	**(₹)**	**Assets**	**(₹)**
Equity Share Capital	?	Fixed Assets (Cost)	?
Reserves & Surplus	?	Less: Accumulated. Depreciation	?
Long Term Loans	6,75,000	Fixed Assets (WDV)	?
Bank Overdraft	60,000	Stock	?
Creditors	?	Debtors	?
		Cash	?
Total	?	Total	?

Ans.

Liabilities	**(₹)**	**Assets**	**(₹)**
Equity Share Capital	12,50,000	Fixed Assets (cost)	20,58,000
Reserves & Surplus	2,50,000	Less: Acc. Depreciation	(3,43,000)
Long Term Loans	6,75,000	Fixed Assets (WDV)	17,15,000
Bank Overdraft	60,000	Stock	2,30,000
Payables	4,00,000	Receivables	2,62,500
		Cash	4,27,500
Total	**26,35,000**	**Total**	**26,35,000**

Working Notes:

(i)	Sales	₹ 21,00,000
	Less: Gross Profit (20%)	₹ 4,20,000
	Cost of Goods Sold (COGS)	₹ 16,80,000

(ii) Receivables Turnover Velocity = $\frac{\text{Average Receivables}}{\text{Credit Sales}} \times 12$

$2 = \frac{\text{Average Receivables}}{21,00,000 \times 75\%} \times 12$

Average Receivables = $\frac{21,00,000 \times 75\% \times 2}{12}$

Average Receivables = ₹ 2,62,500

Closing Receivables = ₹ 2,62,500

(iii) Stock Turnover Velocity = $\frac{\text{Average Stock}}{COGS} \times 12$

Or $1.5 = \frac{\text{Average Stock}}{16,80,000} \times 12$

Or Average Stock = $\frac{16,80,000 \times 1.5}{12}$

Or Average Stock = ₹ 2,10,000

$\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$ = ₹ 2,10, 000

Opening Stock + Closing Stock = ₹ 4,20,000.....(1)

Also, Closing Stock-Opening Stock = ₹ 40,000.....(2)

Solving (1) and (2), we get **closing stock = ₹ 2,30,000**

(iv) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\text{Stock + Receivables + Cash}}{\text{Bank Overdraft + Creditors}}$

Or $2 = \frac{2,30,000 + `2,62,500 + \text{Cash}}{60,000 + \text{Creditors}}$

Or ₹ 1,20,000 + 2 Payables = ₹ 4,92,500 + Cash

Or 2 Payables – Cash.= ₹ 3,72,500

Or Cash = 2 Payables – ₹ 3,72,500.....(3)

Acid Test Ratio = $\frac{\text{Current Assests - Stock}}{\text{Current Liabilities}} = \frac{\text{Debtor + Cash}}{\text{Current Liabilities}}$

Or $\frac{3}{2} = \frac{2,62,500 + \text{Cash}}{60,000 + \text{Creditors}}$

Or ₹ 1,80,000 + 3 Payables = ₹ 5,25,000 + 2 Cash

Or 3 Payables – 2 Cash = ₹ 3,45,000 ..... (4)

Substitute (3) in (4)

Or 3 Payables – 2(2 Payables – ₹ 3,72,500) = ₹ 3,45,000

Or 3 Payables – 4 Payables + ₹ 7,45,000= ₹ 3,45,000 (Payables) = ₹ 3,45,000 - ₹ 7,45,000

Payables = ₹ 4,00,000

So, Cash = 2 x ₹ 4,00,000 – ₹ 3,72,5000

Cash = ₹ 4,27,500

(v) Long term Debt = 45% of Net Worth Or ₹ 6,75,000 = 45% of Net Worth Net Worth = ₹ 15,00,000

(vi) Equity Share Capital (ESC) + Reserves = ₹ 15,00,000
Or ESC + 0.2ESC = ₹ 15,00,000
Or 1.2 ESC = ₹ 15,00,000
Equity Share Capital (ESC) = ₹ 12,50,000

(vii) Reserves = 0.2 x ₹ 12,50,000

Reserves = ₹ 2,50,000

(viii) Total of Liabilities=Total of Assets
Or ₹ 12,50,000 + ₹ 2,50,000 + ₹ 6,75,000 +₹ 60,000 + ₹ 4,00,000 + Fixes Assets(FA) (WDV) + ₹ 2,30,000 + ₹ 2,62,000 +₹ 4,27,500
Or ₹ 26,35,000 = ₹ 9,20,000 + FA(WDV)
FA (WDV) =₹ 17,15,000
Now FA(Cost) – Depreciation = FA(WDV) Or FA(Cost) – FA(Cost)/6 = ₹ 17,15,000
Or 5 FA(Cost)/6 = ₹ 17,15,000
Or FA(Cost) = ₹ 17,15,000x 6/5
So, FA(Cost) = ₹ 20,58,000
Depreciation = ₹ 20,58,000/6 = ₹ 3,43,000

Q.14 Prepare B/S | RTP Nov 22

The following information of ASD Ltd. relate to the year ended 31st March, 2022:

Net profit	8% of sales
Raw materials consumed	20% of Cost of Goods Sold
Direct wages	10% of Cost of Goods Sold
Stock of raw materials	3 months' usage
Stock of finished goods	6% of Cost of Goods Sold
Gross Profit	15% of Sales
Debt collection period (All sales are on credit)	2 Months
Current ratio	2 : 1
Fixed assets to Current assets	13 : 11
Fixed assets to sales	1 : 3
Long-term loans to Current liabilities	2 : 1
Capital to Reserves and Surplus	1 : 4

You are required to PREPARE-

(a) Profit & Loss Statement of ASD Limited for the year ended 31st March, 2022 in the following format.

Particulars	(₹)	Particulars	(₹)
To Direct Materials consumed	?	By Sales	?
To Direct Wages	?		

To	Works (Overhead)	?		
To	Gross Profit c/d	?		
		?		?
To	Selling and Distribution Expenses	?	By Gross Profit b/d	?
To	Net Profit	?		
		?		?

(b) Balance Sheet as on 31st March, 2022 in the following format.

Liabilities	(₹)	Assets	(₹)
Share Capital	?	Fixed Assets	1,30,00,000
Reserves and Surplus	?	Current Assets:	
Long term loans	?	Stock of Raw Material	?
Current liabilities	?	Stock of Finished Goods	?
		Debtors	?
		Cash	?
	?		?

Ans. **Working Notes:**

(i) Calculation of Sales

$$\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$$

$$\frac{1,30,00,000}{\text{Sales}} = \frac{1}{3} \Rightarrow \text{Sales} = ₹\ 3,90,00,000$$

(ii) Calculation of Current Assets

$$\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11}$$

$$\frac{1,30,00,000}{\text{Current Assets}} = \frac{13}{11} \Rightarrow \text{Current Assets} = ₹\ 1,10,00,000$$

(iii) Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	3,90,00,000
Less: Gross Profit (15 % of Sales)	58,50,000
Cost of Goods sold	3,31,50,000
Raw Material Consumption (20% of Cost of Goods Sold)	₹ 66,30,000
Direct Wages (10% of Cost of Goods Sold)₹	33,15,000

(iv) Calculation of Stock of Raw Materials (= 3 months usage)

$= 66,30,000 \times \frac{3}{12} = ₹\ 16,57,500$

(v) Calculation of Stock of Finished Goods (= 6% of Cost of Goods Sold)

$= 3,31,50,000 \times \frac{6}{100} = ₹\ 19,89,000$

(vi) Calculation of Current Liabilities

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = 2$$

$$\frac{1,10,00,000}{\text{Current Liabilities}} = 2 \Rightarrow \text{Current Liabilities} = ₹\ 55,00,000$$

(vii) Calculation of Debtors

$$\text{Average collection period} = \frac{\text{Debtors}}{\text{Credit Sales}} \times 12 \text{ months}$$

$$\frac{\text{Debtors}}{3,90,00,000} \times 12 = 2 \Rightarrow \text{Debtors} = ₹\ 65,00,000$$

(viii) Calculation of Long-term Loan

$$\frac{\text{Long term Loan}}{\text{Current Liabilities}} = \frac{2}{1}$$

$$\frac{\text{Long term Loan}}{55,00,000} = \frac{2}{1} \Rightarrow \text{Long term loan} = ₹\ 1,10,00,000$$

(ix) Calculation of Cash Balance

		₹
Current assets		1,10,00,000
Less: Debtors	65,00,000	
Raw materials stock	16,57,500	
Finished goods stock	19,89,000	1,01,46,500
Cash balance		8,53,500

(x) Calculation of Net worth

Fixed Assets		1,30,00,000
Current Assets		1,10,00,000
Total Assets		2,40,00,000
Less: Long term Loan	1,10,00,000	
Current Liabilities	55,00,000	1,65,00,000
Net worth		75,00,000

Net worth = Share capital + Reserves = ₹ 75,00,000

$$\frac{\text{Capital}}{\text{Reserves and Surplus}} = \frac{1}{4} \Rightarrow \text{Share Capital} = ₹\ 75,00,000 \times \frac{1}{5} = ₹\ 15,00,000$$

Reserves and Surplus = ₹ 75,00,000 × 5 = ₹ 60,00,000

Profit and Loss Statement of ASD Ltd.
for the year ended 31st March, 2022

Particulars	(₹)	Particulars	(₹)
To Direct Materials consumed	66,30,000	By Sales	3,90,00,000
To Direct Wages	33,15,000		

To Works (Overhead) (Bal. fig.)	2,32,05,000		
To Gross Profit c/d (15% of Sales)	58,50,000		
	3,90,00,000		3,90,00,000
To Selling and Distribution Expenses (Bal. fig.)	27,30,000	By Gross Profit b/d	58,50,000
To Net Profit (8% of Sales)	31,20,000		
	58,50,000		**58,50,000**

Balance Sheet of ASD Ltd.
as at 31st March, 2022

Liabilities	(₹)	Assets	(₹)
Share Capital	15,00,000	Fixed Assets	1,30,00,000
Reserves and Surplus	60,00,000	Current Assets:	
Long term loans	1,10,00,000	Stock of Raw Material	16,57,500
Current liabilities	55,00,000	Stock of Finished Goods	19,89,000
		Debtors	65,00,000
		Cash	8,53,500
	2,40,00,000		**2,40,00,000**

Q.15 Debtor / Creditor Ratio | RTP May 22

FM Ltd. is in a competitive market where every company offers credit. To maintain the competition, FM Ltd. sold all its goods on credit and simultaneously received the goods on credit. The company provides the following information relating to current financial year:

Debtors Velocity	3 months
Creditors Velocity	2 months
Stock Turnover Ratio (on Cost of Goods Sold)	1.5
Fixed Assets turnover Ratio (on Cost of Goods Sold)	4
Gross Profit Ratio	25%
Bills Receivables	₹ 75,000
Bills Payables	₹ 30,000
Gross Profit	₹ 12,00,000

FM Ltd. has the tendency of maintaining extra stock of ₹ 30,000 at the end of the period than that at the beginning.

DETERMINE:

(i) Sales and cost of goods sold
(ii) Sundry Debtors
(iii) Closing Stock
(iv) Sundry Creditors
(v) Fixed Assets

Ans. **(i) Determination of Sales and Cost of goods sold:**

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Or, $\frac{25}{100} = \frac{12,00,000}{Sales}$

Or, Sales $= \frac{12,00,00,000}{25} = ₹\ 48,00,000$

Cost of Goods Sold = Sales – Gross Profit
= ₹ 48,00,000 - ₹ 12,00,000 = ₹ 36,00,000

(ii) Determination of Sundry Debtors:

Debtors' velocity is 3 months or Debtors' collection period is 3 months,

So, Debtors' turnover ratio $= \frac{12 months}{3 months} = 4$

Debtors' turnover ratio $= \frac{Credit\ Sales}{Average\ Accounts\ Receivable}$

$\frac{48,00,000}{Bills\ Receivable + Sundry\ Debtors} = 4$

Or, Sundry Debtors + Bills receivable = ₹ 12,00,000
Sundry Debtors = ₹ 12,00,000 – ₹ 75,000 = ₹ 11,25,000

(iii) Determination of Closing Stock

Stock Turnover Ratio = $\frac{Cost\ of\ Goods\ Sold}{Average\ Stock} = \frac{36,00,000}{Average\ Stock} = 1.5$

So, Average Stock = ₹ 24,00,000

Now Average Stock = $\frac{Opening\ Stock + Closing\ Stock}{2}$

Or $\frac{Opening\ Stock + (Opening\ Stock + `30,000)}{2} = ₹\ 24,00,000$

Or 2 Opening Stock + ₹ 30,000= ₹48,00,000
Or 2 Opening Stock = ₹47,70,000
Or, Opening Stock = ₹ 23,85,000
So, Closing Stock = ₹ 23,85,000 + ₹ 30,000 = ₹ 24,15,000

(iv) Determination of Sundry Creditors:

Creditors' velocity of 2 months or credit payment period is 2 months.

So, Creditors' turnover ratio = $\frac{12\ months}{2\ months} = 6$

Creditors turnover ratio $= \frac{Credit\ Purchases*}{Average\ Accounts\ Payables}$

$= \frac{36,30,000}{Sundry\ Creditors + Bills\ Payables} = 6$

So, Sundry Creditors + Bills Payable = ₹ 6,05,000
Or, Sundry Creditors + ₹ 30,000 = ₹ 6,05,000
Or, Sundry Creditors = ₹ 5,75,000

(v) Determination of Fixed Assets

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Fixed Assets}} = 4$$

$$\text{Or, } \frac{36,00,000}{\text{Fixed Assets}} = 4$$

Or, Fixed Asset = ₹ 9,00,000

Workings:

*Calculation of Credit purchases:

Cost of goods sold = Opening stock + Purchases – Closing stock

₹ 36,00,000 = ₹ 23,85,000 + Purchases – ₹ 24,15,000

Purchases (credit) = ₹ 36,30,000

Calculation of credit purchase also can be done as below:

Or Credit Purchases =Cost of goods sold +Difference in Opening Stock

Or Credit Purchases =36,00,000 +30,000=₹ 36,30,000

Q.16 ROCE / EPS / P/E | RTP Dec 21

Following information has been gathered from the books of Cram Ltd. for the year ended 31st March 2021, the equity shares of which is trading in the stock market at ₹ 28:

Particulars	Amount (₹)
Equity Share Capital (Face value @ ₹ 20)	20,00,000
10% Preference Share capital	4,00,000
Reserves & Surplus	16,00,000
12.5% Debentures	12,00,000
Profit before Interest and Tax for the year	8,00,000

CALCULATE the following when company falls within 25% tax bracket:

(i) Return on Capital Employed

(ii) Earnings Per share

(iii) P/E Ratio

Ans. **(i) Return on Capital Employed (ROCE)**

$$\text{ROCE (Pre-tax)} = \frac{\text{Profit before interest and taxes (PBIT)}}{\text{Capital Employed}} \times 100$$

$$= \frac{8,00,000}{52,00,000} \times 100$$

$$= \mathbf{15.38\% \text{ (approx.)}}$$

$$\text{ROCE (Post-tax)} = \frac{\text{PBIT}(1-t)}{\text{Capital Employed}} \times 100$$

$$= \frac{8,00,000\,(1-0.25)}{52,00,000} \times 100$$

$$= \mathbf{11.54\% \text{ (approx.)}}$$

(ii) Earnings Per share (EPS)

$$= \frac{\text{Profit available to equity shareholders}}{\text{Number of equity shares outstanding}}$$

$$= \frac{4,47,500}{1,00,000}$$

= **₹ 4.475**

(iii) P/E Ratio $= \frac{\text{Market Price per Share (MPS)}}{\text{Earning per Share (EPS)}}$

$= \frac{28}{4.475}$ = 6.26 times (approx.)

Workings:

(a) Income Statement

Particulars	Amount (₹)
Profit before Interest and Tax (PBIT)	8,00,000
Interest on Debentures (12.5% of ₹ 12,00,000)	(1,50,000)
Profit before Tax (PBT)	6,50,000
Tax @ 25%	(1,62,500)
Profit after Tax (PAT)	4,87,500
Preference Dividend (10% of ₹ 4,00,000)	(40,000)
Profit available to Equity shareholders	4,47,500

(b) Calculation of Capital Employed

= Equity Shareholder's Fund + Preference share Capital + Debentures

= (₹ 20,00,000 + ₹ 16,00,000) + ₹ 4,00,000 + ₹ 12,00,000 = ₹ 52,00,000

Q.17 Return Ratios | RTP July 21

Given below are the estimations for the next year by Niti Ltd.:

Particulars	(₹ in crores)
Fixed Assets	5.20
Current Liabilities	4.68
Current Assets	7.80
Sales	23.00
EBIT	2.30

The company will issue equity funds of ₹ 5 crores in the next year. It is also considering the debt alternatives of ₹ 3.32 crores for financing the assets. The company wants to adopt one of the policies given below:

(₹ in crores)

Financing Policy	Short term debt @ 12%	Long term debt @ 16%	Total
Conservative	1.08	2.24	3.32
Moderate	2.00	1.32	3.32

Aggressive	3.00	0.32	3.32

Assuming corporate tax rate at 30%, CALCULATE the following for each of the financing policy:

(i) Return on total assets

(ii) Return on owner's equity

(iii) Net Working capital

(iv) Current Ratio

Also advise which Financing policy should be adopted if the company wants high returns.

Ans. **(i) Return on total assets**

$$\text{Return on total assets} = \frac{\text{EBIT}(1-T)}{\text{Total assets (FA + CA)}}$$

$$= \frac{2.30 \text{ crores}(1-0.3)}{5.20 \text{ crores} + ` 7.80 \text{ crores}}$$

$$= \frac{1.61 \text{crores}}{13 \text{ crores}} = 0.1238 \text{ or } 12.38\%$$

(ii) Return on owner's equity

(Amount in ₹)

	Financing policy (₹)		
	Conservative	**Moderate**	**Aggressive**
Expected EBIT	2,30,00,000	2,30,00,000	2,30,00,000
Less: Interest			
Short term Debt @ 12%	12,96,000	24,00,000	36,00,000
Long term Debt @ 16%	35,84,000	21,12,000	5,12,000
Earnings before tax (EBT)	1,81,20,000	1,84,88,000	1,88,88,000
Less: Tax @ 30%	54,36,000	55,46,400	56,66,400
Earnings after Tax (EAT)	1,26,84,000	1,29,41,600	1,32,21,600
Owner's Equity	5,00,00,000	5,00,00,000	5,00,00,000
Return on owner's equity $\frac{\text{Net Profit after taxes (EAT)}}{\text{Owners' equity}}$	= 1,26,84,000 / 5,00,00,000 = 0.2537 or 25.37%	= 1,29,41,600 / 5,00,00,000 = 0.2588 or 25.88%	= 1,32,21,600 / 5,00,00,000 = 0.2644 or 26.44%

(iii) Net Working capital

(₹ in crores)

	Financing policy		
	Conservative	**Moderate**	**Aggressive**
Current Liabilities (Excluding Short Term Debt)	4.68	4.68	4.68
Short term Debt	1.08	2.00	3.00
Total Current Liabilities	5.76	6.68	7.68
Current Assets	7.80	7.80	7.80
Net Working capital = Current Assets - Current	7.80 - 5.76 = 2.04	7.80 - 6.68 = 1.12	7.80 - 7.68 = 0.12

Liabilities			

(iv) Current ratio

(₹ in crores)

	Financing policy		
	Conservative	Moderate	Aggressive
Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$	= $\frac{7.80}{5.76}$ = 1.35	= $\frac{7.80}{6.68}$ = 1.17	= $\frac{7.80}{7.68}$ = 1.02

Advise: It is advisable to adopt aggressive financial policy, if the company wants high return as the return on owner's equity is maximum in this policy i.e. 26.44%.

Q.18 Prepare B/S | RTP Nov 20

Following information has been provided from the books of M/s Laxmi & Co. for the year ending on 31st March, 2020:

Net Working Capital	₹ 4,80,000
Bank overdraft	₹ 80,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	₹ 3,20,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

You are required to PREPARE a summarised Balance Sheet as at 31st March, 2020.

Ans. **Working notes:**

(i) Current Assets and Current Liabilities computation:

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{2.5}{1}$$

Or Current assets	=	2.5 Current liabilities
Now, Working capital	=	Current assets - Current liabilities
Or ₹ 4,80,000	=	2.5 Current liability − Current liability
Or 1.5 Current liability	=	₹ 4,80,000
Current Liabilities	=	₹ 3,20,000
So, Current Assets	=	₹ 3,20,000 x 2.5 = ₹ 8,00,000

(ii) Computation of stock

Liquid ratio	=	$\frac{\text{Liquid assets}}{\text{Current liabilities}}$
Or 1.5	=	$\frac{\text{Current assets - Inventories}}{3,20,000}$
Or 1.5 x ₹ 3, 20,000	=	₹ 8,00,000 - Inventories
Or Inventories	=	₹ 8,00,000 – ₹ 4, 80,000

Or Stock = ₹ 3,20,000

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors

$$\text{Fixed Asset to Proprietary ratio} = \frac{\text{Fixed Assets}}{\text{Proprietary fund}} = 0.75$$

Fixed Assets	=	0.75 Proprietary fund (PF)[FA+NWC = PF]
or NWC	=	PF- FA [(i.e. .75 PF)]
and Net Working Capital (NWC)	=	0.25 Proprietary fund
Or ₹ 4,80,000/0.25	=	Proprietary fund
Or Proprietary fund	=	₹ 19,20,000
and Fixed Assets	=	0.75 proprietary fund
	=	0.75 x ₹ 19,20,000 = ₹ 14,40,000
Capital	=	Proprietary fund - Reserves & Surplus
	=	₹ 19,20,000 - ₹ 3,20,000 = ₹ 16,00,000
Sundry Creditors	=	(Current liabilities - Bank overdraft)
	=	(₹ 3,20,000 - ₹ 80,000) = ₹ 2,40,000

Balance Sheet as at 31st March, 2020

Liabilities	₹	Assets	₹
Capital	16,00,000	Fixed Assets	14,40,000
Reserves & Surplus	3,20,000	Stock	3,20,000
Bank overdraft	80,000	Other Current Assets	4,80,000
Sundry creditors	2,40,000		
	22,40,000		22,40,000

Q.19 ROCE / EPS / P/E | RTP May 20

MT Limited has the following Balance Sheet as on March 31, 2019 and March 31, 2020:

Balance Sheet

	₹ in lakhs	
	March 31, 2019	March 31, 2020
Sources of Funds:		
Shareholders' Funds	2,500	2,500
Loan Funds	3,500	3,000
	6,000	5,500
Applications of Funds: Fixed Assets	3,500	3,000
Cash and bank	450	400
Receivables	1,400	1,100
Inventories	2,500	2,000
Other Current Assets	1,500	1,000
Less: Current Liabilities	(1,850)	(2,000)
	6,000	5,500

The Income Statement of the MT Ltd. for the year ended is as follows:

	₹ in lakhs	
	March 31, 2019	March 31, 2020
Sales	22,500	23,800
Less: Cost of Goods sold	(20,860)	(21,100)
Gross Profit	1,640	2,700
Less: Selling, General and Administrative expenses	(1,100)	(1,750)
Earnings before Interest and Tax (EBIT)	540	950
Less: Interest Expense	(350)	(300)
Earnings before Tax (EBT)	190	650
Less: Tax	(57)	(195)
Profits after Tax (PAT)	133	455

Required:

CALCULATE for the year 2019-20-

(a) Inventory turnover ratio

(b) Financial Leverage

(c) Return on Capital Employed (ROCE)

(d) Return on Equity (ROE)

(e) Average Collection period.

[Take 1 year = 365 days]

Ans. **Ratios for the year 2019-2020**

(a) Inventory turnover ratio

$$= \frac{COGS}{\text{Average Inventory}} = \frac{21,100}{\frac{(2,500+2,000)}{2}} \text{ ₹} = 9.4$$

(b) Financial leverage

$$= \frac{EBIT}{EBT} = \frac{950}{650} = 1.46$$

(c) ROCE

$$= \frac{EBIT(1-t)}{\text{Average Capital Employed}} = \frac{950(1-0.3)}{\left(\frac{6,000+5,500}{2}\right)} = \frac{665}{5,750} \times 100 = 11.56\ \%$$

[Here Return on Capital Employed (ROCE) is calculated after Tax]

(d) ROE

$$= \frac{\text{Profits after tax}}{\text{Average shareholders' funds}} = \frac{455}{2,500} \times 100 = 18.2\%$$

(e) Average Collection Period

$$\text{Average Sales per day} = \frac{23,800}{365} = \text{₹ } 65.20 \text{ lakhs}$$

$$\text{Average collection period} = \frac{\text{Average Receivables}}{\text{Average sales per day}}$$

$$= \frac{`(1,400+1,100)}{2} \div 65.2 = \frac{1,250}{65.2} = 19.17 \text{days}$$

Q.20 All Ratios | RTP Nov 19

The following is the Profit and loss account and Balance sheet of KLM LLP.

Trading and Profit & Loss Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Opening stock	12,46,000	By Sales	1,96,56,000
To Purchases	1,56,20,000	By Closing stock	14,28,000
To Gross profit c/d	42,18,000		
	2,10,84,000		2,10,84,000
		By Gross profit b/d	42,18,000
To Administrative expenses	18,40,000	By Interest on investment	24,600
To Selling & distribution expenses	7,56,000	By Dividend received	22,000
To Interest on loan	2,60,000		
To Net profit	14,08,600		
	42,64,600		42,64,600

Balance Sheet as on…….

Capital & Liabilities	Amount (₹)	Assets	Amount (₹)
Capital	20,00,000	Plant & machinery	24,00,000
Retained earnings	42,00,000	Building	42,00,000
General reserve	12,00,000	Furniture	12,00,000
Term loan from bank	26,00,000	Sundry receivables	13,50,000
Sundry Payables	7,20,000	Inventory	14,28,000
Other liabilities	2,80,000	Cash & Bank balance	4,22,000
	1,10,00,000		1,10,00,000

You are required to COMPUTE:

Q.1 Gross profit ratio
(ii) Net profit ratio
(iii) Operating cost ratio
(iv) Operating profit ratio
(v) Inventory turnover ratio
(vi) Current ratio
(vii) Quick ratio
(viii) Interest coverage ratio
(ix) Return on capital employed
(x) Debt to assets ratio.

Ans. (i) Gross profit ratio = $\frac{\text{Gross profit}}{\text{Sales}} \times 100 = \frac{42,18,000}{1,96,56,000} \times ₹100 = 21.46\%$

(ii) Net profit ratio = $\frac{\text{Net profit}}{\text{Sales}} \times 100 = \frac{14,08,600}{1,96,56,000} \times 100 = 7.17\%$

(iii) Operating ratio = $\frac{\text{Operating cost}}{\text{Sales}} \times 100$

Operating cost = Cost of goods sold + Operating expenses

Cost of goods sold = Sales – Gross profit

= 1,96,56,000 - 42,18,000 = 1,54,38,000

Operating expenses = Administrative expenses + Selling & distribution expenses

= 18,40,000 + 7,56,000 = 25,96,000

Therefore, Operating ratio = $\frac{1,54,38,000 + 25,96,000}{1,96,56,000} \times 100$

= $\frac{1,80,34,000}{1,96,56,000} \times 100 = 91.75\%$

(iv) Operating profit ratio = 100 – Operating cost ratio

= 100 – 91.75% = 8.25%

(v) Inventory turnover ratio = $\frac{\text{Cost of goods sold}}{\text{Average stock}}$

= $\frac{1,54,38,000}{\frac{(14,28,000 + 12,46,000)}{2}}$

= $\frac{1,54,38,000}{13,37,000} = 11.55$ times

(vi) Current ratio = $\frac{\text{Current assets}}{\text{Current liablities}}$

Current assets = Sundry receivables + Inventory + Cash & Bank balance

= 13,50,000 + 14,28,000 + 4,22,000 = 32,00,000

Current liabilities = Sundry Payables + Other liabilities

= 7,20,000 + 2,80,000 = 10,00,000

Current ratio = $\frac{32,00,000}{10,00,000} = 3.2$ times

(vii) Quick Ratio = $\frac{\text{Current assets - Inventories}}{\text{Current liablities}}$

= $\frac{32,00,000 - 14,28,000}{10,00,000} = 1.77$ times

(viii) Interest coverage ratio = $\frac{\text{EBIDT}}{\text{Interest}} = \frac{\text{Net profit} + \text{Interest}}{\text{Interest}}$

= $\frac{14,08,600 + 2,60,000}{2,60,000} = 6.42$ times

(ix) Return on capital employed (ROCE) = $\frac{\text{EBIT}}{\text{Capital employed}} \times 100$

Capital employed = Capital + Retained earnings + General reserve + Term loan
= 20,00,000 + 42,00,000 + 12,00,000 + 26,00,000
= 1,00,00,000

Therefore, ROCE = $\frac{16,68,600}{1,00,00,000} \times 100 = 16.69\%$

(x) Debt to assets ratio = $\frac{\text{Debts}}{\text{Total assets}} \times 100$

= $\frac{26,00,000}{1,10,00,000} \times 100 = 23.64\%$

Q.21 Liquidity / Financial Ratio | RTP May 19

From the following table of financial ratios of R. Textiles Limited, comment on various ratios given at the end:

Ratios	2017	2018	Average of Textile Industry
Liquidity Ratios			
Current ratio	2.2	2.5	2.5
Quick ratio	1.5	2	1.5
Receivable turnover ratio	6	6	6
Inventory turnover	9	10	6
Receivables collection period	87 days	86 days	85 days
Operating profitability			
Operating income -ROI	25%	22%	15%
Operating profit margin	19%	19%	10%
Financing decisions			
Debt ratio	49.00%	48.00%	57%
Return			
Return on equity	24%	25%	15%

COMMENT on the following aspect of R. Textiles Limited

(i) Liquidity
(ii) Operating profits
(iii) Financing
(iv) Return to the shareholders

Ans.

Ratios	Comment
Liquidity	Current ratio has improved from last year and matching the industry average.

	Quick ratio also improved than last year and above the industry average. This may happen due to reduction in receivable collection period and quick inventory turnover. However, this also indicates idleness of funds. Overall it is reasonably good. All the liquidity ratios are either better or same in both the year compare to the Industry Average.
Operating Profits	Operating Income-ROI reduced from last year but Operating Profit Margin has been maintained. This may happen due to variability of cost on turnover. However, both the ratio are still higher than the industry average.
Financing	The company has reduced its debt capital by 1% and saved operating profit for equity shareholders. It also signifies that dependency on debt compared to other industry players (57%) is low.
Return to the shareholders	R's ROE is 24 per cent in 2017 and 25 per cent in 2018 compared to an industry average of 15 per cent. The ROE is stable and improved over the last year.

Q.22 Change in current ratio | RTP Nov 18

Assuming the current ratio of a Company is 2, STATE in each of the following cases whether the ratio will improve or decline or will have no change:

(i) Payment of current liability
(ii) Purchase of fixed assets by cash
(iii) Cash collected from Customers
(iv) Bills receivable dishonoured
(v) Issue of new shares

Ans. Current Ratio = $\frac{\text{Current Assets (CA)}}{\text{Current Liabilities (CL)}}$ = 2 i.e. 2 : 1

S. No.	Situation	Improve/ Decline/ No Change	Reason
(i)	Payment of Current liability	Current Ratio will improve	Let us assume CA is ₹ 2 lakhs & CL is ₹ 1 lakh. If payment of Current Liability = ₹10,000 then, CA = 1,90,000 CL = 90,000. Current Ratio = $\frac{1,90,000}{90,000}$ = 2.11 : 1. When Current Ratio is 2:1 Payment of Current liability will reduce the same amount in the numerator and denominator. Hence, the ratio will improve.
(ii)	Purchase of Fixed Assets by cash	Current Ratio will decline	Since the cash being a current asset converted into fixed asset, current assets reduced, thus current ratio will fall.
(iii)	Cash collected from Customers	Current Ratio will not change	Cash will increase and Debtors will reduce. Hence No Change in Current Asset.
(iv)	Bills Receivable dishonoured	Current Ratio will not change	Bills Receivable will come down and debtors will increase. Hence no change in Current Assets.
(v)	Issue of New Shares	Current Ratio will improve	As Cash will increase, Current Assets will increase and current ratio will increase.

Q.23 Prepare B/S | RTP May 18

Following figures are available in the books Tirupati Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
G P Ratio	25%

Gross profit during the year amounts to ₹ 8,00,000. There is no long-term loan or overdraft. Reserve and surplus amount to ₹ 2,00,000. Ending inventory of the year is ₹ 20,000 above the beginning inventory.

Required:

CALCULATE various assets and liabilities and PREPARE a Balance sheet of Tirupati Ltd.

Ans.

(a) $\text{G.P. ratio} = \frac{\text{Gross Profit}}{\text{Sales}} = 25\%$

$\text{Sales} = \frac{\text{Gross Profit}}{25} \times 100 = \frac{8,00,000}{25} \times 100 = ₹\ 32,00,000$

(b) Cost of Sales = Sales – Gross profit

= ₹ 32,00,000 - ₹ 8,00,000

= ₹ 24,00,000

(c) Receivable turnover = $\frac{\text{Sales}}{\text{Receivables}} = 4$

= $\text{Receivables} = \frac{\text{Sales}}{4} = \frac{32,00,000}{4} = ₹\ 8,00,000$

(d) Fixed assets turnover = $\frac{\text{Cost of Sales}}{\text{Fixed Assets}} = 8$

Fixed assets = $\frac{\text{Cost of Sales}}{8} = \frac{24,00,000}{8}$

(e) Inventory turnover = $\frac{\text{Cost of Sales}}{\text{Average Stock}} = 8$

Average Stock = $\frac{\text{Cost of Sales}}{8} = \frac{`24,00,000}{8} = ₹\ 3,00,000$

Average Stock = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$

Average Stock = $\frac{\text{Opening Stock} + \text{Opening Stock} + 20,000}{2}$

Average Stock = Opening Stock + ₹ 10,000

Opening Stock = Average Stock - ₹ 10,000

= ₹ 3,00,000 - ₹10,000

= ₹ 2,90,000

Closing Stock = Opening Stock + ₹ 20,000

= ₹ 2,90,000 + ₹ 20,000

= ₹ 3,10,000

(f) Payable turnover = $\frac{\text{Purchases}}{\text{Payables}}$ = 6

Purchases = Cost of Sales + Increase in Stock

= ₹ 24,00,000 + ₹ 20,000

= ₹ 24,20,000

Payables = $\frac{\text{Purchases}}{6} = \frac{24,20,000}{6}$ = ₹ 4,03,333

(g) Capital turnover = $\frac{\text{Cost of Sales}}{\text{Capital Employed}}$ = 2

Capital Employed = $\frac{\text{Cost of Sales}}{2} = \frac{24,00,000}{2}$ = ₹12,00,000

(h) Share Capital = Capital Employed – Reserves & Surplus

= ₹ 12,00,000 – ₹ 2,00,000 = ₹ 10,00,000

Balance Sheet of Tirupati Ltd as on……

Liabilities	Amount (₹)	Assets	Amount (₹)
Share Capital	10,00,000	Fixed Assets	3,00,000
Reserve & Surplus	2,00,000	Closing Inventories	3,10,000
Payables	4,03,333	Receivables	8,00,000
		Other Current Assets	1,93,333
	16,03,333		16,03,333

(Fixed Asset turnover, inventory turnover capital turnover is calculated on cost sales)

Q.24 Inventory T/O | MTP Nov 23 (2)

ABC Ltd. has total sales of 12,00,000 all of which are credit sales. It has a gross profit ratio of 20% on sales and a current ratio of 2. The company's current liabilities are ₹ 3,00,000. Further, it has inventories of ₹ 1,00,000, marketable securities of ₹ 70,000 and cash of ₹ 50,000. From the above information:

(i) CALCULATE the average inventory if the expected inventory turnover ratio is three times?

(ii) Also CALCULATE the average collection period if the opening balance of debtors is expected to be ₹ 1,20,000.

Assume 360 days a year.

Ans. **(i) Calculation of Average Inventory**

Since gross profit is 20% of sales, the cost of goods sold should be 80% of the sales.

Cost of goods sold = 12,00,000 x $\frac{80}{100}$ = 9,60,000

Inventory Turnover = $\frac{\text{Cost of goods sold}}{\text{Average Inventory}}$

= $\frac{9,60,000}{\text{Average Inventory}}$

$$\text{Average Inventory} = \frac{9,60,000}{3} = 3,20,000$$

(ii) Calculation of Average Collection Period

$$\text{Average Collection Period} = \frac{\text{Average Receivable}}{\text{Credit Sales}} \times 360$$

$$\text{Where, Average Receivables} = \frac{\text{Opening Receivables} - \text{Closing Receivables}}{2}$$

Calculation of Closing balance of Receivables

	₹	₹
Current Assets (2 x 3,00,000)		6,00,000
Less: Inventories	1,00,000	
Less: Marketable Securities	70,000	
Less: Cash	50,000	2,20,000
Receivables (Closing Balance)		**3,80,000**

$$\text{Now, Average Receivables} = \frac{1,20,000 + 3,80,000}{2} = 2,50,000$$

$$\text{So, Average Collection Period} = \frac{2,50,000}{12,00,000} \times 360 = 75 \text{ days}$$

Q.25 Prepare B/S | MTP Nov 23 (1)

Following information has been provided from the books of Laxmi Pvt. Ltd. for the year ending on 31st March 2022:

Net Working Capital	₹ 5,40,000
Bank overdraft	₹ 1,00,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	₹ 4,80,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

You are required to PREPARE a summarised Balance Sheet as of 31st March 2022 assuming that there is no long-term debt.

Ans. **Working notes:**

(i) Computation of Current Assets and Current Liabilities

$$\frac{\text{Current assets}}{\text{Current liabilities}} = 2.5$$

Current assets = 2.5 Current liabilities

Now, Working capital = Current assets - Current liabilities

₹ 5,40,000 = 2.5 Current liability - Current liability

Or 1.5 Current liability = ₹ 5,40,000

Current Liabilities = ₹ 3,60,000
So, Current Assets = ₹ 3,60,000 × 2.5 = ₹ 9,00,000

(ii) Computation of Inventories

$$\text{Liquid ratio} = \frac{\text{Liquid assets}}{\text{Current liabilities}}$$

$$1.5 = \frac{\text{Current assets - Inventories}}{3,60,000}$$

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors

$$\text{Fixed Asset to Proprietary ratio} = \frac{\text{Fixed assets}}{\text{Proprietary fund}} = 0.75$$

Fixed Assets = 0.75 Proprietary fund
Proprietary fund = Fixed Assets + Net Working Capital - Long Term Debt
= 0.75 Proprietary fund + ₹ 5,40,000 - 0
Proprietary fund = ₹ 21,60,000
And Fixed Assets = 0.75 proprietary fund
= 0.75 x ₹ 21,60,000 = ₹ 16,20,000
Capital = Proprietary fund - Reserves & Surplus
= ₹ 21,60,000 - ₹ 4,80,000 = ₹ 16,80,000
Sundry Creditors = Current liabilities - Bank overdraft
= ₹ 3,60,000 - ₹ 1,00,000 = ₹ 2,60,000

Balance Sheet as of 31st March 2022

Liabilities	₹	Assets	₹
Capital	16,80,000	Fixed Assets	16,20,000
Reserves & Surplus	4,80,000	Inventories	3,60,000
Bank overdraft	1,00,000	Other Current Assets	5,40,000
Sundry creditors	2,60,000	(Balancing figure)	
	25,20,000		**25,20,000**

Q.26 Prepare B/S | MTP May 23 (2)

Using the following information, PREPARE the balance sheet:

Long-term debt to net worth	0.25
Total asset turnover	3
Average collection period	9 days
Inventory turnover	13
Gross profit margin	20%
Acid-test ratio	1.5

*Assume a 360-day year and all sales on credit.

Liabilities	₹	Assets	₹
Notes and payables	2,50,000	Cash	?
Long-term debt	?	Accounts receivable	?

Common stock	8,00,000	Inventory	?
Retained earnings	16,00,000	Plant and equipment	?
Total liabilities and equity	?	Total assets	?

Ans.

Working Notes:

(i) Long term Debt

Long Term Debt/ Net worth = 0.25

Long Term Debt/ (8,00,000+16,00,000) = 0.25

Long term debt = 6,00,000

(ii) Total assets

Total liabilities and Equity = Notes and payables + Long-term debt + Common stock + Retained earnings

= 2,50,000+6,00,000+8,00,000+16,00,000

Total assets = Total liabilities and Equity = 32,50,000

(iii) Sales and Cost of Goods sold

Total asset turnover = 3 = Sales/ Total Assets = Sales/32,50,000

Sales = 97,50,000

Cost of goods sold = (100% - Gross Profit margin) x Sales

= (100% - 20%) x 97,50,000 =78,00,000.

(iv) Current Assets

Inventory turnover = 13 = COGS/ Inventory = 78,00,000/Inventory

Inventory = ₹ 6,00,000

Average collection period = 9 = Receivables/Sales x 360 = Receivables/ 97,50,000 x 360

Accounts receivables = 2,43,750

Acid-test ratio = 1.5 = (Cash+ Accounts Receivables) /Notes and Payables

= (Cash +2,43,750)/2,50,000 = 1.5

Cash = 1,31,250

(v) Plant and equipment

= Total Assets - Current Assets

= 32,50,000 - (1,31,250+2,43,750+6,00,000) = 22,75,000

Balance Sheet

Liabilities	₹	**Assets**	₹
Notes and payables	2,50,000	Cash	1,31,250
Long-term debt	6,00,000	Accounts receivable	2,43,750
Common stock	8,00,000	Inventory	6,00,000
Retained earnings	16,00,000	Plant and equipment	22,75,000
Total liabilities and equity	**32,50,000**	**Total assets**	**32,50,000**

Q.27 Prepare B/S | MTP May 23 (1)

Based on the following particulars SHOW various assets and liabilities of Raina Ltd.

Fixed assets turnover ratio

(Based on Cost of sales) 10 times

Capital turnover ratio

(Based on Cost of sales) 3 times

Inventory Turnover	10 times
Receivable turnover	5 times
Payable turnover	5 times
GP Ratio	40%

Gross profit during the year amounts to Rs.15,00,000. There is no long -term loan or overdraft. Reserve and surplus amount to Rs.5,00,000. Ending inventory of the year is Rs. 40,000 above the beginning inventory.

Ans. G.P. ratio = Gross Profit/Sales = 40

(a) Sales $= \frac{\text{Gross Profit}}{40} \times 100 = \frac{15,00,000}{40} \times 100$

$= 37,50,000$

(b) Cost of Sales = Sales Gross Profit = ₹ 37,50,000 - ₹ 15,00,000

= ₹ 22,50,000

(c) Receivable turnover $= \frac{\text{Sales}}{\text{Receivables}} = 5$

$= \text{Receivables} = \frac{\text{Sales}}{5} = \frac{37,50,000}{5}$

= ₹7,50,000

(d) Fixed assets turnover $= \frac{\text{Cost of Sales}}{\text{Fixed Assets}} = 10$

Or Fixed assets $= \frac{\text{Cost of Sales}}{10} = \frac{22,50,000}{10} =$ ₹ 2,25,000

(e) Inventory turnover $= \frac{\text{Cost of Sales}}{\text{Average Stock}} = 10$

Average Stock $= \frac{\text{Cost of Sales}}{10} = \frac{22,50,000}{10} =$ ₹ 2,25,000

Average Stock $= \frac{\text{Opening Stock} + \text{Closing stock}}{2} = \frac{\text{Opening stock} + \text{Opening stock} + 40,000}{2}$

Average Stock = Opening+ ₹ 20,000

Opening Stock = Average Stock- ₹ 20,000

Average Stock = ₹ 2,25,000 – ₹ 20,000

Opening Stock = ₹ 2,05,000

Closing Stock = Opening Stock + ₹ 40,000

Closing Stock = ₹ 2,05,000 +₹ 40,000 =₹ 2,45,000

(f) Payable turnover $= \frac{\text{Purchase}}{\text{Payables}} = 5$

Purchases = Cost of Sales + Increase in Stock

Purchases = ₹22,50,000 + ₹40,000 = ₹22,90,000

Payables $= \frac{\text{Purchase}}{5} = \frac{22,90,000}{5}$

= ₹4,58,000

(h) Capital Employed $= \frac{\text{Cost of Sales}}{3} = \frac{22,50,000}{3}$

= ₹7,50,000

Equity share Capital = Capital Employed – Reserves & Surplus

= ₹7,50,000 – ₹5,00,000 = ₹2,50,000

Balance Sheet of T Ltd as on……

Liabilities	₹	Assets	₹
Capital	2,50,000	Fixed Assets	2,25,000
Reserve & Surplus	5,00,000	Stock	2,45,000
Payables	4,58,000	Receivables	7,50,000
		Other Current Assets (balancing figure)	2,38,000
	14,58,000		14,58,000

Q.28 Prepare B/S & PL | MTP Nov 22 (2)

From the following information and ratios, PREPARE the Balance sheet as at 31st March 2022 and Income statement for the year ended on that date for M/s Ganguly & Co -

Average Stock	₹10 lakh
Current Ratio	3:1
Acid Test Ratio	1:1
PBIT to PBT	2.2:1
Average Collection period (Assume 360 days in a year)	30 days
Stock Turnover Ratio (Use sales as turnover)	5 times
Fixed assets turnover ratio	0.8 times
Working Capital	₹10 lakh
Net profit Ratio	10%
Gross profit Ratio	40%
Operating expenses (excluding interest)	₹ 9 lakh
Long term loan interest	12%
Tax	Nil

Ans.

1. **Current Ratio = 3:1**

Current Assets (CA)/Current Liability (CL) = 3:1

CA = 3CL

WC = 10,00,000

CA – CL = 10,00,000

3CL – CL = 10,00,000

2CL = 10,00,000

CL = 10, 00, 000

CL = ₹5,00,000

CA = 3 x 5,00,000

CA = ₹15,00,000

2. Acid Test Ratio = CA – Stock / CL = 1:1
= 15, 00, 000 – Stock/5,00,000 = 1
15,00,000 – stock = 5,00,000
Stock = ₹10,00,000

3. Stock Turnover ratio (on sales) = 5
Sales/ Avg stock = 5
Sales/10,00,000 = 5
Sales = ₹50,00,000

4. **Gross Profit** = 50,00,000 x 40% = **₹20,00,000**
Net profit (PBT) = 50,00,000 x 10% = **₹5,00,000**

5. PBIT/PBT = 2.2
PBIT = 2.2 x 5,00,000
PBIT= 11,00,000
Interest = 11,00,000 – 5,00,000 = **₹6,00,000**
Long term loan = $\frac{6,00,000}{0.12}$ = **₹50,00,000**

6. Average collection period = 30 days
Receivables = 30/360 x 50.00.000 = 4,16,667

7. Fixed Assets Turnover Ratio = 0.8
50,00,000/ Fixed Assets = 0.8
Fixed Assets = **₹62,50,000**

Income Statement

	Amount (₹)
Sales	50,00,000
Less: Cost of Goods Sold	30,00,000
Gross Profit	20,00,000
Less: Operating Expenses	9,00,000
Less: Interest.	6,00,000
Net Profit	5,00,000

Balance sheet

Liabilities	Amount (₹)	Assets		Amount (₹)
Equity share capital	22,50,000	Fixed asset		62,50,000
Long term debt	50,00,000	Current assets:		
Current liability	5,00,000	Stock	10,00,000	
		Receivables	4,16,667	
		Other	83,333	15,00,000
	77,50,000			77,50,000

Q.29 ROCE | MTP Nov 22 (1)

PI Limited has the following Balance Sheet as on March 31, 2020 and March 31, 2021:

Balance Sheet

Particulars	March 31, 2020	March 31, 2021
Sources of Funds:		
Shareholders' Funds	87,500	87,500
Loan Funds	1,22,500	1,05,000
	2,10,000	1,92,500
Applications of Funds:		
Fixed Assets	87,500	1,05,000
Cash and bank	15,750	14,000
Receivables	49,000	38,500
Inventories	87,500	70,000
Other Current Assets	35,000	35,000
Less: Current Liabilities	(64,750)	(70,000)
	2,10,000	1,92,500

The Income Statement of the PI Ltd. for the year ended is as follows:

Particulars	March 31, 2020	March 31, 2021
Sales	7,87,500	8,33,000
Less: Cost of Goods sold	(7,30,100)	(7,38,500)
Gross Profit	57,400	94,500
Less: Selling, General and Administrative expenses	(38,500)	(61,250)
Earnings before Interest and Tax (EBIT)	18,900	33,250
Less: Interest Expense	(12,250)	(10,500)
Earnings before Tax (EBT)	6,650	22,750
Less: Tax	(1,995)	(6,825)
Profits after Tax (PAT)	4,655	15,925

You are required to CALCULATE for the year 2020-21:

(i) Inventory turnover ratio

(ii) Financial Leverage

(iii) Return on Capital Employed (after tax)

Ans. Ratios for the year 2020-21

(i) Inventory turnover ratio

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

(ii) Financial leverage

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

(iii) ROCE

$$= \frac{EBIT(1-t)}{\text{Average Capital Employed}} = \frac{33,250(1-0.3)}{\left(\frac{2,10,000+1,92,500}{2}\right)} = \frac{23,275}{2,01,250} \times 100 = 11.56\ \%$$

Q.30 Prepare B/S | MTP May 22 (2)

From the following information, you are required to PREPARE a summarised Balance Sheet for Rudra Ltd. for the year ended 31st March, 2022

Debt Equity Ratio	1:1
Current Ratio	3:1
Acid Test Ratio	8:3
Fixed Asset Turnover (on the basis of sales)	4
Stock Turnover (on the basis of sales)	6
Cash in hand	5,00,000
Stock to Debtor	1:1
Sales to Net Worth	4
Capital to Reserve	1:2
Gross Profit	20% of Cost
COGS to Creditor	10:1

Interest for entire year is yet to be paid on Long Term loan @ 10% .

Ans.

Balance Sheet of Rudra Ltd.

Liabilities	Amount (₹)	Assets	Amount (₹)
Capital	10,00,000	Fixed Assets	30,00,000
Reserves	20,00,000	Current Assets:	
Long Term Loan @ 10%	30,00,000	Stock in Trade	20,00,000
Current Liabilities:		Debtors	20,00,000
Creditors	10,00,000	Cash	5,00,000
Other Short-term Current Liability (Other STCL)	2,00,000		
Outstanding Interest	3,00,000		
	75,00,000		**75,00,000**

Working Notes:

Let sales be ₹ x

Balance Sheet of Rudra Ltd.

Liabilities	Amount (₹)	Assets	Amount (₹)
Capital		Fixed Assets	x/4
Reserves		Current Assets:	
Net Worth	x/4	Stock in Trade	x/6
Long Term Loan @ 10%	x/4	Debtors	x/6

		Cash	5,00,000
Current liabilities:			
Creditors	x/12		
Other Short-term Current Liability			
Outstanding Interest			
Total Current Liabilities	x/9+5,00,000/3		
Total		**Total**	

1 Fixed Asset Turnover = 4 $= \frac{x}{\text{Fixed Assets}}$

Fixed Assets $= \frac{x}{4}$

2. Stock Turnover = 6 $= \frac{x}{\text{Stock}}$

Stock $= \frac{x}{6}$

3. Sales to net worth = 4 $= \frac{x}{\text{Net worth}}$

net worth $= \frac{x}{4}$

4. Debt: Equity = 1 : 1

$\frac{\text{Long Term Loan}}{\text{Net worth}} = \frac{1}{1}$

Long term loan = Net worth = $\frac{x}{4}$

5. Gross Profit to Cost = 20%

$\frac{GP}{\text{Sales} - GP} = 20\%$

$\frac{GP}{x - GP} = 20\%$

$GP = 0.2x - 0.2\,GP$

$1.2\,GP = 0.2x$

$GP = \frac{0.2x}{1.2}$

$GP = x/6$

Cost of Goods Sold $= x - x/6 = 5/6\,x$

6. COGS to creditors = 10:1

$\frac{COGS}{\text{Creditors}} = \frac{10}{1}$

$\frac{\frac{5x}{6}}{\text{creditors}} = \frac{10}{1}$

Creditors $= \frac{5x}{60} = \frac{x}{12}$

7. $\frac{\text{Stock}}{\text{Debtor}} = 1$

Debtor = Stock $= \frac{x}{6}$

8. Current Ratio = 3 : 1

$$\frac{\text{Stock + Debtors + Cash}}{\text{Debtor}} = \frac{3}{1}$$

$$\frac{\frac{x}{6}+\frac{x}{6}+5,00,000}{\text{Current Liabilities}} = 3$$

$$\frac{\frac{x}{3}+5,00,000}{3} = CL$$

$$CL = \frac{x}{9}+\frac{5,00,000}{3}$$

9. $CA = 3CL$

$$= 3\left(\frac{x}{9}+\frac{5,00,000}{3}\right)$$

$$CA = \frac{x}{3} + 5,00,000$$

10. Net worth + Long Term Loan + Current Liability = Fixed Asset + Current Assets

$$\frac{x}{4}+\frac{x}{4}+\frac{x}{9}+\frac{5,00,000}{3} = \frac{x}{4}+\frac{x}{3}+5,00,000$$

$$\frac{x}{4}+\frac{x}{9}-\frac{x}{3} = 5,00,000 - \frac{5,00,000}{3}$$

$$\frac{9x+4x-12x}{36} = \frac{15,00,000-5,00,000}{3}$$

$$\frac{x}{36} = \frac{10,00,000}{3}$$

$$= 1,20,00,000$$

11. Now, from above calculations, we get,

-> Fixed Asset $= \frac{x}{4} = \frac{1,20,00,000}{4} = 30,00,000$

-> Stock $= \frac{x}{6} = \frac{1,20,00,000}{6} = 20,00,000$

-> Debtor $= \frac{x}{6} = \frac{1,20,00,000}{6} = 20,00,000$

-> Net Worth = x / 4 = 30,00,000

Now, Capital to Reserve is 1 : 2

Capital = ₹ 10,00,000

and, Reserve = ₹ 20,00,000

-> Long Term Loan = $\frac{x}{4}$ = 30,00,000

-> Outstanding Interest = 30,00,000×10% = 3,00,000

-> Creditors $= \frac{x}{12} = \frac{1,20,00,000}{12} = 10,00,000$

-> Current Liabilities = Creditors + Other STCL + Outstanding Interest

$\frac{x}{9} = \frac{5,00,000}{3}$ = 10,00,000+ Other STCL + 3,00,000

$\frac{1,20,00,000}{9} = \frac{5,00,000}{3}$ = 13,00,000+ Other STCL

15,00,000	= Other STCL + 13,00,000
Other STCL	= 2,00,000

Q.31 Prepare B/S | MTP May 22 (1)

Owner's equity of Yay Ltd. is ₹ 6,00,000. The financial ratios of the company are given below:

Current debt to total debt	0.4
Total debt to Owner's equity	0.6
Fixed assets to Owner's equity	0.6
Total assets turnover	2 times
Inventory turnover	8 times

COMPLETE the following Balance Sheet from the information given above:

Liabilities	(₹)	Assets	(₹)
Current Debt	-	Cash	-
Long-term Debt	-	Inventory	-
Total Debt	-	Total Current Assets	-
Owner's Equity	-	Fixed Assets	-
	9,60,000		-

Ans.

Balance Sheet

Liabilities	(₹)	**Assets**	(₹)
Current debt	1,44,000	Cash (balancing figure) Inventory	3,60,000
Long term debt	2,16,000	Total Current Assets	2,40,000
Total Debt	3,60,000	Fixed Assets	6,00,000
Owner's Equity	6,00,000	Total Assets	3,60,000
Total liabilities	9,60,000		9,60,000

Working Notes:

1. Total debt = 0.60 x Owner's Equity = 0.60 x ₹ 6,00,000 = ₹ 3,60,000

   Further, Current debt to Total debt = 0.40.

   So, Current debt = 0.40 × ₹ 3,60,000 = ₹ 1,44,000

   Long term debt = ₹ 3,60,000 - ₹ 1,44,000 = ₹ 2,16,000

2. Fixed assets = 0.60 × Owner's Equity = 0.60 × ₹ 6,00,000 = ₹ 3,60,000

3. Total Assets = Total Liabilities = ₹ 9,60,000

   Total assets to turnover = 2 TOimes; Inventory turnover = 8 Times

   Hence, Inventory /Total assets = 2/8=1/4, Therefore, Inventory = ₹ 9,60,000/4 = ₹ 2,40,000

Q.32 Decision on basis of ratio | MTP Dec 21 (2)

Jensen and spencer pharmaceutical is in the business of manufacturing pharmaceutical drugs including the newly invented Covid vaccine. Due to increase in demand of Covid vaccines, the production had increased at all time high level and the company urgently needs a loan to meet the cash and investment requirements. It

had already submitted a detailed loan proposal and project report to Expo-Impo bank, along with the financial statements of previous three years as follows:

Statement of Profit and Loss **(In ₹ '000)**

	2018-19	2019-20	2020-21
Sales			
Cash	400	960	1,600
Credit	3,600	8,640	14,400
Total sales	4,000	9,600	16,000
Cost of goods sold	2,480	5,664	9,600
Gross profit	1,520	3,936	6,400
Operating expenses:			
General, administration, and selling expenses	160	900	2,000
Depreciation	200	800	1,320
Interest expenses (on borrowings)	120	316	680
Profit before tax (PBT)	1,040	1,920	2,400
Tax @ 30%	312	576	720
Profit after tax (PAT)	728	1,344	1,680

BALANCE SHEET **(In ₹ '000)**

	2018-19	2019-20	2020-21
Assets			
Non-Current Assets			
Fixed assets (net of depreciation)	3,800	5,000	9,400
Current Assets			
Cash and cash equivalents	80	200	212
Accounts receivable	600	3,000	4,200
Inventories	640	3,000	4,500
Total	**5,120**	**11,200**	**18,312**
Equity & Liabilities			
Equity share capital (shares of ₹10 each)	2,400	3,200	4,000
Other Equity	728	2,072	3,752
Non-Current borrowings	1,472	2,472	5,000
Current liabilities	520	3,456	5,560
Total	**5,120**	**11,200**	**18,312**

INDUSTRY AVERAGE OF KEY RATIOS

Ratio	Sector Average
Current ratio	2.30:1
Acid test ratio (quick ratio)	1.20:1
Receivable turnover ratio	7 times
Inventory turnover ratio	4.85 times
Long-term debt to total debt	24%
Debt-to-equity ratio	35%
Net profit ratio	18%
Return on total assets	10%

Interest coverage ratio (times interest earned)	10

As a loan officer of Expo-Impo Bank, you are REQUIRED to apprise the loan proposal on the basis of comparison with industry average of key ratios considering closing balance for accounts receivable of ₹ 6,00,000 and inventories of ₹ 6,40,000 respectively as on 31st March, 2018.

Ans.

(In ₹ '000)

Ratio	Formula	2018-19	2019-20	2020-21	Industry Average
Current Ratio	Current assets / Current liabilities	1,320 / 520 = 2.54	6,200 / 3,456 = 1.80	8,912 / 5,560 = 1.60	2.30:1
Acid test ratio (quick ratio)	Quick Assets / Current Liabilities	680 / 520 = 1.31	3,200 / 3,456 = 0.93	4,412 / 5,560 = 0.79	1.20:1
Receivable turnover ratio	Credit Sales / Average Accounts Receivable	3,600 / (600+600)/2 = 6	8,640 / (600+3,000)/2 = 4.80	14,400 / (3,000+4,200)/2 = 4	7 times
Inventory turnover ratio	COGS / Average Inventory	2,480 / (640+640)/2 = 3.88	5,664 / (640+3,000)/2 = 3.11	9,600 / (3,000+4,500)/2 = 2.56	4.85 times
Long-term debt to total debt	Long term Debt × 100 / Total Debt	1,472 × 100 / 1,992 = 73.90%	2,472 × 100 / 5,928 = 41.70%	5,000 × 100 / 10,560 = 47.35%	24%
Debt-to-equity ratio	Long term Debt ×100 / Shareholders' Equity	1,472 × 100 / 3,128 = 47.06%	2,472 × 100 / 5,272 = 46.89%	5,000 × 100 / 7,752 = 64.50%	35%
Net profit ratio	Net Profit ×100 / Sales	728 × 100 / 4,000 = 18.2%	1,344 × 100 / 9,600 = 14%	1,680 × 100 / 16,000 = 10.5%	18%
Return on total assets	Net Profit after taxes ×100 / Total assets	728 × 100 / 5,120 = 14.22%	1,344 × 100 / 11,200 = 12%	1,680 × 100 / 18,312 = 9.17%	10%
Interest coverage ratio (times interest earned)	EBIT / Interest	1,160 / 120 = 9.67	2,236 / 316 = 7.08	3,080 / 680 = 4.53	10

Conclusion:

In the last two years, the current ratio and quick ratio are less than the ideal ratio (2:1 and 1:1 respectively) indicating that the company is not having enough resources to meet its current obligations. Receivables are

growing slower. Inventory turnover is slowing down as well, indicating a relative build-up in inventories or increased investment in stock. High Long-term debt to total debt ratio and Debt to equity ratio compared to that of industry average indicates high dependency on long term debt by the company. The net profit ratio is declining substantially and is much lower than the industry norm. Additionally, though the Return on Total Asset(ROTA) is near to industry average, it is declining as well. The interest coverage ratio measures how many times a company can cover its current interest payment with its available earnings. A high interest coverage ratio means that an enterprise can easily meet its interest obligations, however, it is declining in the case of Jensen & Spencer and is also below the industry average indicating excessive use of debt or inefficient operations.

On overall comparison of the industry average of key ratios than that of Jensen & Spencer, the company is in deterioration position. The company's profitability has declined steadily over the period. However, before jumping to the conclusion relying only on the key ratios, it is pertinent to keep in mind the industry, the company dealing in with i.e. manufacturing of pharmaceutical drugs. The pharmaceutical industry is one of the major contributors to the economy and is expected to grow further. After the covid situation, people are more cautious towards their health and are going to spend relatively more on health medicines. Thus, while analysing the loan proposal, both the factors, financial and non-financial, needs to be kept in mind.

Q.33 Average Inventory | MTP Dec 21 (1)

ABC Ltd. has total sales of 10,00,000 all of which are credit sales. It has a gross profit ratio of 25% and a current ratio of 2. The company's current liabilities are ₹ 2,00,000. Further, it has inventories of ₹ 80,000, marketable securities of ₹ 50,000 and cash of ₹ 30,000. From the above information:

(i) CALCULATE the average inventory, if the expected inventory turnover ratio is three times?

(ii) Also CALCULATE the average collection period if the opening balance of debtors is expected to be ₹ 1,50,000. Assume 360 days a year.

Ans.

(i) Calculation of Average Inventory

Since gross profit is 25% of sales, the cost of goods sold should be 75% of the sales.

Cost of goods sold = 10,00,000 x 75/100 = 7,50,000

$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Average Inventory}}$$

$$3 = \frac{7,50,000}{\text{Average Inventory}}$$

$$\text{Average Inventory} = \frac{7,50,000}{3} = 2,50,000$$

(ii) Calculation of Average Collection Period

$$\text{Average Collection Period} = \frac{\text{Average Debtors}}{\text{Credit Sales}} \times 360$$

$$\text{Where, Average Debtors} = \frac{\text{Opening Debtors} + \text{Closing Debtors}}{2}$$

Calculation of Closing balance of debtors

	₹	₹

Current Assets (2 x 2,00,000)		4,00,000
Less: Inventories	80,000	
Marketable Securities	50,000	
Cash	30,000	1,60,000
Debtors Closing Balance		**2,40,000**

Now, Average Debtors = $\frac{1,50,000 + 2,40,000}{2}$ = 1,95,000

So, Average Collection Period = $\frac{1,95,000}{10,00,000}$ x 360 = 70.2 or 70 days

Q.34 Prepare B/S | MTP Dec 21 (1)

The following figures and ratios are related to a company:

(i)	Sales for the year (all credit)	₹ 30,00,000
(ii)	Gross Profit ratio	25 percent
(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1 : 1
(vi)	Current ratio	1.5 : 1
(vii)	OReceivables (Debtors) collection period	2 months
(viii)	Reserves and surplus to Share capital	0.6 : 1
(ix)	Capital gearing ratio	0.5
(x)	Fixed assets to net worth	1.20 : 1

You are REQUIRED to prepare:

(a) Balance Sheet of the company on the basis of above details.

(b) The statement showing working capital requirement, if the company wants to make a provision for contingencies @ 10 percent of net working capital including such provision.

Ans. **Working Notes:**

(i) Cost of Goods Sold = Sales – Gross Profit (25% of Sales)
= ₹ 30,00,000 – ₹ 7,50,000
= ₹ 22,50,000

(ii) Closing Stock = Cost of Goods Sold / Stock Turnover
= ₹ 22,50,000/6 = ₹ 3,75,000

(iii) Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
= ₹ 22,50,000/1.5
= ₹ 15,00,000

(iv) Current Assets:
Current Ratio = 1.5 and Liquid Ratio = 1
Stock = 1.5 – 1 = 0.5
Current Assets = Amount of Stock × 1.5/0.5
= ₹ 3,75,000 × 1.5/0.5 = ₹ 11,25,000

(v) Liquid Assets (Debtors and Cash)

= Current Assets – Stock
= ₹ 11,25,000 – ₹ 3,75,000
= ₹ 7,50,000

(vi) Debtors = Sales × Debtors Collection period /12
= ₹ 30,00,000 × 2 /12
= ₹ 5,00,000

(vii) Cash = Liquid Assets – Debtors
= ₹ 7,50,000 – ₹ 5,00,000 = ₹ 2,50,000

(viii) Net worth = Fixed Assets /1.2
= ₹ 15,00,000/1.2 = ₹ 12,50,000

(ix) Reserves and Surplus
Reserves and Share Capital = 0.6 + 1 = 1.6
Reserves and Surplus = ₹ 12,50,000 × 0.6/1.6
= ₹ 4,68,750

(x) Share Capital = Net worth – Reserves and Surplus
= ₹ 12,50,000 – ₹ 4,68,750
= ₹ 7,81,250

(xi) Current Liabilities = Current Assets/Current Ratio
= ₹ 11,25,000/1.5 = ₹ 7,50,000

(xii) Long-term Debts
Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund
Long-term Debts = ₹ 12,50,000 × 0.5 = ₹ 6,25,000

(a) Preparation of Balance Sheet of a Company

Balance Sheet

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital	7,81,250	Fixed Assets	15,00,000
Reserves and Surplus	4,68,750	Current Assets	
Long-term Debts	6,25,000	Stock	3,75,000
Current Liabilities	7,50,000	Debtors	5,00,000
		Cash	2,50,000
	26,25,000		**26,25,000**

(b) Statement Showing Working Capital Requirement

	(₹)	(₹)
Current Assets		
(i) Stocks		3,75,000
(ii) Receivables (Debtors)		5,00,000
(iii) Cash in hand & at bank		2,50,000
A. Current Assets: Total		11,25,000
Current Liabilities		
B. Current Liabilities: Total		7,50,000
Add: Provision for contingencies		3,75,000
		41,667
		4,16,667

Working capital requirement		

Q.35 Prepare B/S | MTP May 21 (2)

XYZ Ltd. has Owner's equity of Rs. 2,00,000 and the ratios of the company are as follows:

Current debt to total debt	0.3
Total debt to Owner's equity	0.5
Fixed assets to Owner's equity	0.6
Total assets turnover	2 times
Inventory turnover	10 times

COMPLETE the following Balance Sheet from the information given above:

Liabilities	(Rs.)	Assets	(Rs.)
Current Debt	-	Cash	-
Long-term Debt	-	Inventory	-
Total Debt	-	Total Current Assets	-
Owner's Equity	-	Fixed Assets	-

Ans.

Balance Sheet

Liabilities	(Rs.)	Assets	(Rs.)
Current debt	30,000	Cash (balancing figure)	1,20,000
Long term debt	70,000	Inventory	60,000
Total Debt	1,00,000	Total Current Assets	1,80,000
Owner's Equity	2,00,000	Fixed Assets	1,20,000
Total liabilities	3,00,000	Total Assets	3,00,000

Workings:

1. Total debt = 0.50 x Owner's Equity = 0.50 x Rs. 2,00,000 = Rs. 1,00,000

   Further, Current debt to Total debt = 0.30

   So, Current debt = 0.30 × Rs. 1,00,000 = Rs. 30,000

   Long term debt = Rs. 1,00,000 - Rs. 30,000 = Rs. 70,000

2. Fixed assets = 0.60 × Owner's Equity = 0.60 × Rs. 2,00,000 = Rs. 1,20,000

3. Total Liabilities = Total Debt + Owner's Equity

   = Rs. 1,00,000 + Rs. 2,00,000 = Rs. 3,00,000

   Total Assets = Total Liabilities = Rs. 3,00,000

   Total assets to turnover = 2 Times; Inventory turnover = 10 Times

   Hence, Inventory /Total assets = 2/10=1/5, Therefore Inventory = Rs. 3,00,000/5 = Rs. 60,000

Q.36 Prepare B/S | MTP May 21 (1)

SN Ltd. has furnished the following ratios and information relating to the year ended 31 st March 2021:

Share Capital Rs. 6,25,000

Working Capital	Rs. 2,00,000
Gross Margin	25%
Inventory Turnover	5 times
Average Collection Period	1.5 months
Current Ratio	1.5:1
Quick Ratio	0.7:1
Reserves & Surplus to Bank & Cash	3 times

Further, the assets of the company consist of fixed assets and current assets, while its current liabilities comprise bank credit and others in the ratio of 3:1. Assume 360 days in a year.

You are required to PREPARE the Balance Sheet as on 31st March 2021.

(Note- Balance sheet may be prepared in traditional T Format.)

Ans. **Workings:**

1. Current Ratio $= \frac{\text{Current Assets(CA)}}{\text{Current Liabilities(CL)}} = \frac{15}{1}$

CA = 1.5 CL

Also, CA - CL = Rs. 2,00,000

1.5 CL- CL = Rs. 2,00,000

$CL = \frac{Rs.2,00,000}{0.5} = Rs.\ 4,00,000$

CA = 1.5 × Rs. 4,00,000 = Rs. 6,00,000

2. Bank Credit (BC) to Other Current Liabilities (OCL) ratio = 3:1

$\frac{\text{Bank Credit (BC)}}{\text{Other Current Liabilities (OCL)}} = \frac{3}{1}$

BC = 3 OCL Also, BC + OCL = CL

3 OCL + OCL = Rs. 4,00,000

$OCL = \frac{Rs.4,00,000}{4} = Rs.\ 1,00,000$

Bank Credit = 3 × Rs. 1,00,000 = Rs. 3,00,000

3. Quick Ratio $= \frac{\text{Current Assets - Inventories}}{\text{Current Liabilities}}$

$0.7 = \frac{Rs.\ 6,00,000 - Inventories}{Rs.4,00,000}$

Inventories = Rs. 6,00,000 – Rs. 2,80,000 = Rs. 3,20,000

4. Inventory Turnover = 5 times

$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold (COGS)}}{\text{Average Inventory}}$$

$$\text{Average Inventory} = \frac{\text{Cost of goods sold (COGS)}}{\text{Inventory Turnover}}$$

COGS = Rs. 3,20,000 × 5 = Rs. 16,00,000

5. Gross Margin $= \frac{\text{Sales - COGS}}{\text{25\% Sales}} \times 100 =$

$$\text{Sales} = \frac{16,00,000}{0.75} = \text{Rs. } 21,33,333.33$$

6. Average Collection Period (ACP) = 1.5 months = 45 days

$$\text{Debtors Turnover} = \frac{360}{ACP} = \frac{360}{45} = 8 \text{ times}$$

$$\text{Also, Debtors Turnover} = \frac{\text{Sales}}{\text{Average Debtors}}$$

$$\text{Hence, Debtors} = \frac{\text{Rs.}21,33,333.33}{8} = \text{Rs.}2,66,667$$

Q.37 Calculate Ratios | MTP May 20

The following accounting information and financial ratios of A&R Limited relate to the year ended 31st March, 2020:

Inventory Turnover Ratio	6 Times
Creditors Turnover Ratio	10 Times
Debtors Turnover Ratio	8 Times
Current Ratio	2.4
Gross Profit Ratio	25%

Total sales Rs.6,00,00,000; cash sales 25% of credit sales; cash purchases Rs.46,00,000; working capital Rs.56,00,000; closing inventory is Rs.16,00,000 more than opening inventory.

You are required to CALCULATE:

(i) Average Inventory
(ii) Purchases
(iii) Average Debtors
(iv) Average Creditors
(v) Average Payment Period
(vi) Average Collection Period
(vii) Current Assets
(viii) Current Liabilities.

Take 365 days a year

Ans.

(i) Computation of Average Inventory

Gross Profit = 25% of Rs.6,00,00,000 = Rs.1,50,00,000

Cost of goods sold (COGS) = Sales - Gross Profit

= Rs.6,00,00,000 – Rs.1,50,00,000

= Rs.4,50,00,000

$$\text{Inventory Turnover Ratio} = \frac{COGS}{\text{Average Inventory}}$$

$$6 = \frac{Rs.4,50,00,000}{\text{Average Inventory}}$$

Average inventory = Rs.75,00,000

(ii) Computation of Purchases

Purchases = COGS + (Closing Stock – Opening Stock)

= Rs.4,50,00,000 + 16,00,000

* Purchases = Rs.4,66,00,000

* Increase in Stock = Closing Stock – Opening Stock = Rs.16,00,000

(iii) Computation of Average Debtors

Let Credit Sales be Rs.100, Cash sales = $\frac{25}{100}$ x 100 = Rs.25

Total Sales = 100 + 25= Rs.125

Total sales is Rs.125 credit sales is Rs.100

If total sales is Rs.6,00,00,000, then credit sales is = $\frac{Rs.6,00,00,000 \times 100}{125}$

Credit Sales = Rs.4,80,00,000

Cash Sales = (Rs.6,00,00,000 – Rs.4,80,00,000) = Rs.1,20,00,000

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average debtors}} = 8$$

$$= \frac{Rs.4,80,00,000}{\text{Average debtors}} = 8$$

$$\text{Average Debtors} = \frac{Rs.4,80,00,000}{8}$$

Average Debtors = Rs.60,00,000

(iv) Computation of Average Creditors

Credit Purchases = Purchases – Cash Purchases

= Rs.4,66,00,000 – Rs.46,00,000 = Rs.4,20,00,000

$$\text{Creditors Turnover Ratio} = \frac{\text{Credit Purchases}}{\text{Average Creditors}}$$

$$10 = \frac{Rs.4,20,00,000}{\text{Average Creditors}}$$

Average Creditors = Rs.42,00,000

(v) Computation of Average Payment Period

$$\text{Average Payment Period} = \frac{\text{Average Creditors}}{\text{Average Daily Credit Purchases}}$$

$$= \frac{\text{Rs. 42,00,000}}{\left(\frac{\text{Credit Purchases}}{365}\right)} = \frac{\text{Rs. 42,00,000}}{\left(\frac{4,20,00,000}{365}\right)}$$

$$\text{Alternatively} = \frac{\text{Rs.42, 00, 000}}{\text{Rs.4,20,00,000}} \times 365 = 36.5 \text{ days}$$

Average Payment Period = 365/Creditors Turnover Ratio

$$= \frac{365}{10} = 36.5 \text{ days}$$

(vi) Computation of Average Collection Period

$$\text{Average Collection Period} = \frac{\text{Average Debtors}}{\text{Net Credit Sales}} \times 365$$

$$= \frac{\text{Rs.60, 00, 000}}{\text{Rs.4,80,00,000}} \times 365 = 45.625 \text{ days}$$

Alternatively

$$\text{Average collection period} = \frac{365}{\text{Debtors Turnover Ratio}} = 45.625 \text{ days}$$

(vii) Computation of Current Assets

$$\text{Current Ratio} = \frac{\text{Current Assets (CA)}}{\text{Current Liabilities (CL)}} \times 2.4$$

2.4 Current Liabilities = Current Assets

$$\text{or CL} = \frac{CA}{2.4}$$

Further, Working capital = Current Assets – Current liabilities

$$\text{So, Rs.56,00,000} = CA - \frac{CA}{2.4}$$

$$\text{Rs.56,00,000} = \frac{1.4CA}{2.4} \quad \text{Or, } 1.4\ CA = \text{Rs.1,34,40,000}$$

CA = Rs.96,00,000

(viii) Computation of Current Liabilities

$$\text{Current liabilities} = \frac{\text{Rs.96, 00, 000}}{2.4} = \text{Rs.40,00,000}$$

Q.38 Return on Assets | MTP Nov 19

MNP Limited has made plans for the year 2019 -20. It is estimated that the company will employ total assets of Rs.50,00,000; 30% of assets being financed by debt at an interest cost of 9% p.a. The direct costs for the year are estimated at Rs. 30,00,000 and all other operating expenses are estimated at Rs. 4,80,000. The sales revenue are estimated at Rs. 45,00,000. Tax rate is assumed to be 40%.

CALCULATE:

(i) Net profit margin (After tax);
(ii) Return on Assets (After tax);
(iii) Asset turnover; and
(iv) Return on Equity

Ans. **The net profit is calculated as follows:**

	Rs.
Sales Revenue	45,00,000
Less: Direct Costs	30,00,000
Gross Profits	15,00,000
Less: Operating Expense	4,80,000
Earnings before Interest and tax (EBIT)	10,20,000
Less: Interest on debt (9% × 15,00,000)	1,35,000
Earnings before Tax) (EBT)	8,85,000
Less: Taxes (@ 40%)	3,54,000
Profit after Tax (PAT)	5,31,000

(i) Net Profit Margin (After Tax)

$$\text{Net Profit Margin} = \frac{EBIT(1-t)}{Sales} \times 100 = \frac{Rs.10,20,000 \times (1-0.4)}{Rs.45,00,000} = 13.6\%$$

(ii) Return on Assets (ROA) (After tax)

$$ROA = \frac{EBIT(1-t)}{Total\ Assets}$$

$$= \frac{Rs.10,20,000\ (1-0.4)}{Rs.50,00,000} = \frac{Rs.6,12,000}{Rs.50,00,000} = 0.1224 = 12.24\ \%$$

(iii) Asset Turnover

$$\text{Asset Turnover} = \frac{Sales}{Assets} = \frac{Rs.45,00,000}{Rs.50,00,000} = 0.9$$

Asset Turnover = 0.9 times

(iv) Return on Equity (ROE)

$$ROE = \frac{PAT}{Equity} = \frac{Rs.5,31,000}{Rs.35,00,000} = 15.17\%$$

ROE = 15.17%

Q.39 Prepare B/S | MTP May 19 (1)

Using the following information, PREPARE and complete the Balance Sheet given below:

(i)	Total debt to net worth	:	1 : 2
(ii)	Total assets turnover	:	2
(iii)	Gross profit on sales	:	30%
(iv)	Average collection period (Assume 360 days in a year)	:	40 days

(v) Inventory turnover ratio based on cost of goods sold and year-end inventory : 3

(vi) Acid test ratio : 0.75

Ans. Net worth = Capital + Reserves and surplus

= 4,00,000 + 6,00,000 = Rs.10,00,000

$$\frac{\text{Total Debt}}{\text{Net worth}} = \frac{1}{2}$$

Total debt = Rs. 5,00,000

Total Liability side = Rs. 4,00,000 + Rs. 6,00,000 + Rs. 5,00,000

= Rs. 15,00,000

= Total Assets

$$\text{Total Assets Turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

$$2 = \frac{\text{Sales}}{\text{Rs.15,00,000}}$$

Sales = Rs. 30,00,000

Gross Profit on Sales : 30% i.e. Rs. 9,00,000

Cost of Goods Sold (COGS) = Rs. 30,00,000 – Rs. 9,00,000

= Rs. 21,00,000

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{Inventory}}$$

$$3 = \frac{\text{Rs.21,00,000}}{\text{Inventory}}$$

Inventory = Rs. 7,00,000

$$\text{Average collection period} = \frac{\text{Average debtors}}{\text{Sales / day}}$$

$$40 = \frac{\text{Debtors}}{\text{Rs.30,00,000 / 360}}$$

Debtors = Rs.3,33,333.

$$\text{Acid test ratio} = \frac{\text{Current Assets - Stock (Quick Asset)}}{\text{Current liabilities}}$$

$$0.75 = \frac{\text{Current Assets - Rs.7,00,000}}{\text{Rs.5,00,000}}$$

Current Assets = Rs.10,75,000.

Fixed Assets = Total Assets – Current Assets

= Rs.15,00,000 – Rs.10,75,000 = Rs.4,25,000

Cash and Bank balance = Current Assets – Inventory – Debtors

= Rs.10,75,000 – Rs.7,00,000 – Rs.3,33,333 = Rs.41,667

Balance Sheet as on March 31, 20X8

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	4,00,000	Plant and Machinery and other	
Reserves & Surplus	6,00,000	Fixed Assets	4,25,000
Total Debt:		Current Assets:	
Current liabilities	5,00,000	Inventory	7,00,000
		Debtors	3,33,333
		Cash	41,667
	15,00,000		15,00,000

Q.40 Prepare B/S | MTP May 19 (2)

With the help of the following information ANALYSE and complete the Balance Sheet of Anup Ltd.:

Equity share capital	Rs. 1,00,000
The relevant ratios of the company are as follows:	
Current debt to total debt	0.40
Total debt to Equity share capital	0.60
Fixed assets to Equity share capital	0.60
Total assets turnover	2 Times
Inventory turnover	8 Times

Ans.

MNOP Ltd.

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Equity share capital	1,00,000	Fixed assets	60,000
Current debt	24,000	Cash (balancing figure)	60,000
Long term debt	36,000	Inventory	40,000
	1,60,000		1,60,000

Working Notes

1. Total debt= 0.60 x Equity share capital = 0.60 Rs. 1,00,000 = Rs. 60,000

   Further,Current debt to total debt = 0.40. So, currentdebt = 0.40 × Rs.60,000 = Rs.24,000, Long term debt= Rs.60,000 - Rs.24,000= Rs. 36,000

2. Fixed assets = 0.60 × Equity share Capital = 0.60 × Rs. 1,00,000 = Rs. 60,000

3. Total assetsto turnover = 2 Times:Inventory turnover = 8 Times

   Hence, Inventory /Total assets= 2/8=1/4, Total assets= Rs. 1,60,000

Q.41 Prepare B/S | MTP Nov 18 (2)

From the following information, PREPARE a summarised Balance Sheet as at 31st March, 20X6:

Working Capital Rs.2,40,000

Bank overdraft	Rs.40,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	Rs.1,60,000
Current ratio	2.5
Liquid ratio	1.5

Ans. **Working notes:**

(i) Current assets and Current liabilities computation:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2.5}{1}$$

Or, $\frac{\text{Current assets}}{2.5} = \frac{\text{Current liabilities}}{1}$ = k (say)

Or, Current Assets = 2.5 k and Current Liabilities = k

Or, Working capital = (Current Assets − Current Liabilities) Or, Rs.2,40,000 = k (2.5 − 1) = 1.5 k

Or, k = Rs.1,60,000

Current Liabilities = Rs. 1,60,000

Current Assets = Rs.1,60,000 × 2.5 = Rs.4,00,000

(ii) Computation of stock

$$\text{Liquid ratio} = \frac{\text{Liquid assets}}{\text{Current liabilities}}$$

$$\text{Or, } 1.5 = \frac{\text{Current Assets - Stock}}{\text{Rs.1,60,000}}$$

Or, 1.5 × Rs.1,60,000 = Rs.4,00,000 − Stock

Or, Stock = Rs.1,60,000

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry payables (creditors)

$$\text{Proprietary ratio} = \frac{\text{Fixed assets}}{\text{Proprietary fund}} = 0.75$$

Fixed assets = 0.75 Proprietary fund

And Net working capital = 0.25 Proprietary fund

Or, Rs.2,40,000/0.25 = Proprietary fund

Or, Proprietary fund = Rs.9,60,000

And Fixed assets = 0.75 proprietary fund

= 0.75 x Rs.9,60,000

= Rs.7,20,000

Equity Capital = Proprietary fund - Reserves & Surplus

= Rs.9,60,000 - Rs.1,60,000

= Rs.8,00,000

Sundry payables (creditors) = (Current liabilities − Bank overdraft)

= (Rs.1,60,000 − Rs.40,000) = Rs.1,20,000

Balance Sheet

Liabilities	(Rs.)	Assets	(Rs.)
Equity Capital	8,00,000	Fixed assets	7,20,000

Reserves & Surplus	1,60,000	Stock	1,60,000
Bank overdraft	40,000	Current assets	2,40,000
Sundry payables	1,20,000		
	11,20,000		11,20,000

Q.42 Debtor / Creditor | MTP Nov 18 (1)

Following information relate to a concern:

Debtors Velocity	3 months
Credits Velocity	2 months
Stock Turnover Ratio	1.5
Gross Profit Ratio	25%
Bills Receivables	Rs. 25,000
Bills Payables	Rs. 10,000
Gross Profit	Rs. 4,00,000
Fixed Assets to turnover Ratio	4

Closing stock of the period is Rs. 10,000 above the opening stock. CALCULATE

(i) Sales and cost of goods sold
(ii) Sundry Debtors
(iii) Sundry Creditors
(iv) Closing Stock
(v) Fixed Assets

Ans.

(i) Determination of Sales and Cost of goods sold:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$\text{Or, } \frac{25}{100} = \frac{\text{Rs.4,00,000}}{\text{Sales}}$$

$$\text{Or, Sales} = \frac{\text{Rs.4,00,000}}{25} = \text{Rs. 16,00,000}$$

Cost of Goods Sold = Sales – Gross Profit
= Rs. 16,00,000 - Rs. 4,00,000 = Rs. 12,00,000

(ii) Determination of Sundry Debtors:

Debtors velocity is 3 months or Debtors' collection period is 3 months,

$$\text{So, Debtors' turnover ratio} = \frac{12\text{months}}{3\text{months}} = 4$$

$$\text{Debtors' turnover ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

$$= \frac{\text{Rs.16,00,000}}{\text{Bills Receivable} + \text{Sundry Debtors}} = 4$$

Or, Sundry Debtors + Bills receivable = Rs. 4,00,000
Sundry Debtors = Rs. 4,00,000 – Rs. 25,000 = Rs. 3,75,000

(iii) Determination of Sundry Creditors:

Creditors velocity of 2 months or credit payment period is 2 months.

So, Creditors' turnover ratio = $\frac{12\text{months}}{2\text{months}}$ = 6

Creditors turnover ratio = $\frac{\text{Credit Purchases}^*}{\text{Average Accounts Payables}}$

= $\frac{\text{Rs.12,10,000}}{\text{Sundry Creditors + Bills Payables}}$ = 6

So, Sundry Creditors + Bills Payable = Rs. 2,01,667

Or, Sundry Creditors + Rs. 10,000 = Rs. 2,01,667

Or, Sundry Creditors = Rs. 2,01,667 – Rs. 10,000 = Rs. 1,91,667

(iv) Closing Stock

Stock Turnover Ratio = $\frac{\text{Cost of Goods Sold}}{\text{Average Stock}}$ = $\frac{\text{Rs.12,00,000}}{\text{Average Stock}}$ = 1.5

So, Average Stock = Rs. 8,00,000

Now Average Stock = $\frac{\text{Opening Stock + Closing Stock}}{2}$

Or $\frac{\text{Opening Stock + (Opening Stock + Rs.10, 000)}}{2}$ = Rs. 8,00,000

Or, Opening Stock = Rs. 7,95,000

So, Closing Stock= Rs. 7,95,000 + Rs. 10,000 = Rs. 8,05,000

(v) Calculation of Fixed Assets

Fixed Assets Turnover Ratio = $\frac{\text{Cost of Goods Sold}}{\text{Fixed Assets}}$ = 4

Or, $\frac{\text{Rs.12,00,000}}{\text{Fixed Assets}}$ = 4

Or, Fixed Asset = Rs. 3,00,000

Workings:

***Calculation of Credit purchases:**

Cost of goods sold = Opening stock + Purchases – Closing stock

Rs. 12,00,000 = Rs. 7,95,000 + Purchases – Rs. 8,05,000

Rs. 12,00,000 + Rs. 10,000 = Purchases Rs. 12,10,000 = Purchases (credit).

Assumption:

(i) All sales are credit sales

(ii) All purchases are credit purchase

(iii) Stock Turnover Ratio and Fixed Asset Turnover Ratio may be calculated either on Sales or on Cost of Goods Sold.

Q.43 | Prepare B/S | MTP May 18

Based on the following particulars, PREPARE a balance sheet showing various assets and liabilities of T Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
GP Ratio	25%

Gross profit during the year amounts to ₹ 8,00,000. There is no long-term loan or overdraft.
Reserve and surplus amount to ₹ 2,00,000. Ending inventory of the year is ₹ 20,000 above the beginning inventory.

Ans.

(a) G.P. ratio = $\frac{\text{Gross Profit}}{\text{Sales}}$ = 25%

Sales = $\frac{\text{Gross Profit}}{25} \times 100$ = $\frac{\text{`}8,00,000}{25} \times 100$ = ₹32,00,000

(b) Cost of Sales = Sales – Gross profit
= ₹ 32,00,000 - ₹ 8,00,000
= ₹ 24,00,000

(c) Receivable turnover = $\frac{\text{Sales}}{\text{Receivables}}$ = 4

= Receivables = $\frac{\text{Sales}}{4}$

= $\frac{32,00,000}{4}$ = ₹ 8,00,000

Q.44 All Ratios | ICAI MAT

In a meeting held at Solan towards the end of 2021-22, the Directors of HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01. 04.2022 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:

INCOME STATEMENT

Particulars	*2021-22 (₹)*		*2022-23 (₹)*	
Cash Sales	*30,000*		*32,000*	
Credit Sales	*2,70,000*	*3,00,000*	*3,42,000*	*3,74,000*
Less: Cost of goods sold		*2,36,000*		*2,98,000*
Gross profit		*64,000*		*76,000*
Less: Operating Expenses:				
Warehousing	*13,000*		*14,000*	
Transport	*6,000*		*10,000*	
Administrative	*19,000*		*19,000*	
Selling	*11,000*	*49,000*	*14,000*	*57,000*
Net Profit		*15,000*		*19,000*

BALANCE SHEET

Assets & Liabilities	*2021-22 (₹)*		*2022-23 (₹)*	
Fixed Assets (Net Block)	-	*30,000*	-	*40,000*

Receivables	*50,000*		*82,000*	
Cash at Bank	*10,000*		*7,000*	
Stock	*60,000*		*94,000*	
Total Current Assets (CA)	*1,20,000*		*1,83,000*	
Payables	*50,000*		*76,000*	
Total Current Liabilities (CL)	*50,000*		*76,000*	
Working Capital (CA - CL)		*70,000*		*1,07,000*
Net Assets		*1,00,000*		*1,47,000*
Represented by:				
Share Capital		*75,000*		*75,000*
Reserve and Surplus		*25,000*		*42,000*
Debentures		-		*30,000*
		1,00,000		*1,47,000*

You are required to CALCULATE the following ratios for the years 2021-22 and 2022-23:

(i) Gross Profit Ratio
(ii) Operating Expenses to Sales Ratio
(iii) Operating Profit Ratio
(iv) Capital Turnover Ratio
(v) Stock Turnover Ratio
(vi) Net Profit to Net Worth Ratio
(vii) Receivables Collection Period

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of ₹ 40,000 for the year 2021-22. Ignore Taxation.

Ans.

Computation of Ratios		
Ratio	**2021-22 (₹)**	**2022-23 (₹)**
1. Gross profit ratio (Gross profit/sales)	$\frac{64,000 \times 100}{3,00,000}$ =21.3%	$\frac{76,000 \times 100}{3,74,000}$ =20.3%
2. Operating expense to sales ratio (Operating exp/ Total sales)	$\frac{49,000 \times 100}{3,00,000}$ =16.3%	$\frac{57,000 \times 100}{3,74,000}$ =15.2%
3. Operating profit ratio (Operating profit/ Total sales)	$\frac{15,000 \times 100}{3,00,000}$ = 5%	$\frac{19,000 \times 100}{3,74,000}$ =5.08%
4. Capital turnover ratio (Sales/capital employed)	$\frac{3,00,000}{1,00,000}$ = 3	$\frac{3,74,000}{1,47,000}$ = 2.54
5. Stock turnover ratio (COGS/ Average stock) (Refer to W.N. 1)	$\frac{2,36,000}{50,000}$ = 4.72	$\frac{2,98,000}{77,000}$ = 3.87
6. Net Profit to Net worth ratio (Net profit / Net worth)	$\frac{15,000 \times 100}{1,00,000}$ = 15%	$\frac{19,000 \times 100}{1,17,000}$ =16.24%
7. Receivables collection period	$\frac{50,000}{739.73}$ = 67.6 days	$\frac{82,000}{936.99}$ = 87.5 days

(Average receivables/Average daily credit sales) (Refer to W.N. 2)		
Working notes (W.N.):		
1. Average Stock = (opening stock + closing stock)/2	(40,000 + 60,000)/2 = 50,000	(60,000 + 94,000)/2 = 77,000
2. Average daily sales = Credit sales / 365	$\frac{2,70,000}{365}$ = 739.73	$\frac{3,42,000}{365}$ = 936.99

Analysis: The decline in the Gross profit ratio could be either due to a reduction in the selling price or increase in the direct expenses (since the purchase price has remained the same). In this case, cost of goods sold have increased more than proportion of increment in sales & hence impacting gross profit ratio.
Similarly, there is a decline in the ratio of operating expenses to sales. Further analysis reveals that in comparison to increase in sales, there has a lesser proportionate increase in operating expenses. As a result, even the operating profit ratio has remained the same approximately in spite of a decline in the Gross profit ratio.
The company has not been able to deploy its capital efficiently. This is indicated by a decline in the Capital turnover ratio from 3 to 2.54 times.
The decline in stock turnover ratio implies that the company has increased its investment in stock. Net Profit to Net worth ratio has increased indicating that the company's Net worth or Shareholders' capital is efficient in generating profits.
The increase in the Receivables collection period indicates that the company has become liberal in extending credit on sales. There is a corresponding increase in
the receivables also due to such credit policy.

Q.45 All Ratios ICAI MAT

Following is the abridged Balance Sheet of Alpha Ltd.:

Liabilities	₹	**Assets**	₹	₹
Share Capital	1,00,000	Land and Buildings		80,000
Profit and Loss Account	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	15,000	35,000
				1,15,000
		Stock	21,000	
		Receivables	20,000	
		Bank	1,000	42,000
Total	1,57,000	Total		1,57,000

With the help of the additional information furnished below, you are required to

PREPARE Trading and Profit & Loss Account and Balance Sheet as at 31st March, 2023:

(i) The company went in for re-organisation of capital structure, with share capital remaining the same as follows:

Share capital	50%
Other Shareholders' funds	15%
5% Debentures	10%
Current Liabilities	25%

Debentures were issued on 1st April, interest being paid annually on 31st March.

(ii) Land and Buildings remained unchanged. Additional plant and machinery has been bought and a further ₹ 5,000 depreciation was written off.
(The total fixed assets then constituted 60% of total fixed and current assets.)

(iii) Working capital ratio was 8 : 5.

(iv) Quick assets ratio was 1 : 1.

(v) The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.

(vi) Return on net worth was 10%.

(vii) Gross profit was at the rate of 15% of selling price. (viii) Stock turnover was eight times for the year. Ignore Taxation.

Ans.

Particulars	%	(₹)
Share capital (given to be same)	50%	1,00,000
Other shareholders funds	15%	30,000
5% Debentures	10%	20,000
Current Liabilities	25%	50,000
Total (1,00,000 / 50%)	100%	2,00,000

Calculation of Assets

Total liabilities	=	Total Assets
₹ 2,00,000	=	Total Assets
Fixed Assets	=	60% of total fixed assets and current assets
	=	₹ 2,00,000 × 60/100 = ₹ 1,20,000
Current Assets	=	Total Assets – Fixed Assets
	=	₹ 2,00,000 – ₹ 1,20,000 = ₹ 80,000

Calculation of additions to Plant & Machinery

	₹
Total fixed assets	1,20,000
Less: Land & Buildings	80,000
Plant and Machinery (after providing depreciation)	40,000
Less: Existing Plant & Machinery (after extra depreciation of ₹ 5,000) i.e. 50,000 – 20,000	30,000
Addition to the Plant & Machinery	10,000

Calculation of stock

Quick ratio: $= \frac{\text{Current assets} - \text{stock}}{\text{Current liabilities}} = 1$

$= \frac{`80,\ 000\ -\ stock}{50,000} = 1$

₹ 50,000 = ₹ 80,000 – Stock

Stock = ₹ 80,000 - ₹ 50,000

= ₹ 30,000

Receivables = 4/5th of quick assets

= (₹ 80,000 – ₹ 30,000) x 4/5

= ₹ 40,000

Receivables turnover $= \frac{\text{Receivables}}{\text{Credit Sales}} \times 12\text{Months} = 2 \text{ months}$

$= \frac{40,000 \times 12}{\text{Credit Sales}} = 2 \text{ months}$

2×credit sales = 4,80,000

Credit sales = 4,80,000/2

= ₹ 2,40,000 = Total Sales (As there were no cash sales)

Gross profit = 15% of sales = ₹ 2,40,000 x 15/100 = ₹ 36,000

Return on net worth (net profit)

Net worth = ₹ 1,00,000 + ₹ 30,000

= ₹ 1,30,000

Net profit = ₹ 1,30,000 x 10/100 = ₹ 13,000

Debenture interest = ₹ 20,000 x 5/100 = ₹ 1,000

Projected profit and loss account for the year ended 31st March, 2023

Particulars	₹	Particulars	₹
To cost of goods sold	2,04,000	By sales	2,40,000
To gross profit	36,000		
	2,40,000		2,40,000
To debenture interest	1,000	By gross profit	36,000
To administration and other expenses (bal. fig.)	22,000		
To net profit	13,000		
	36,000		36,000

Projected Balance Sheet as at 31st March, 2023

Liabilities	₹	Assets		₹
Share capital	1,00,000	Fixed assets:		
Profit and loss A/c	30,000	Land & buildings		80,000
(17,000+13,000)		Plant & machinery	60,000	
5% Debentures	20,000	*Less*: Depreciation	20,000	40,000
Current liabilities	50,000	Current assets		
		Stock	30,000	

		Receivables	40,000	
		Bank	10,000	
				80,000
	2,00,000			2,00,000

Q.46 All Ratios | ICAI MAT

X Co. has made plans for the next year. It is estimated that the company will employ total assets of ₹ 8,00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at ₹ 4,80,000 and all other operating expenses are estimated at ₹ 80,000. The goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent. You are required to CALCULATE: (i) Operating profit margin (before tax); (ii) net profit margin (after tax); (iii) return on assets (on operating profit after tax); (iv) asset turnover and (v) return on owners' equity.

Ans. **The net profit is calculated as follows:**

Particulars	₹
Sales (150% of ₹ 4,80,000)	7,20,000
Direct costs	(4,80,000)
Gross profit	2,40,000
Operating expenses	(80,000)
Profit before Interest and Tax (EBIT)	1,60,000
Interest changes (8% of ₹ 4,00,000)	(32,000)
Profit before taxes	1,28,000
Taxes (@ 50%)	(64,000)
Net profit after taxes	64,000

(i) Operating profit margin = $\frac{EBIT}{Sales} = \frac{1,60,000}{7,20,000}$ = 0.2222 or 22.22%

(ii) Net profit margin = $\frac{NetProfit\ after\ taxes}{Sales} = \frac{64,000}{7,20,000}$ = 0.89 or 8.9%

(iii) Return on assets = $\frac{EBIT(1-T)}{Assets} = \frac{1,60,000(1-0.5)}{8,00,000}$ = 0.10 or 10%

(iv) Asset turnover = $\frac{Sales}{Assets} = \frac{7,20,000}{8,00,000}$ = 0.9 times

(v) Return on equity = $\frac{NetProfit\ after\ taxes}{Owners'\ equity} = \frac{64,000}{50\%\ of\ `\ 8,00,000}$

= $\frac{64,000}{4,00,000}$ = 0.16 or 16%

Q.47 Balance Sheet | ICAI MAT

From the following ratios and information given below, PREPARE Trading Account, Profit and Loss Account and

Balance Sheet of Aebece Company:	
Fixed Assets	₹ 40,00,000
Closing Stock	₹ 4,00,000
Stock turnover ratio	10
Gross profit ratio	25 percent
Net profit ratio	20 percent
Net profit to capital	1/5
Capital to total liabilities	1/2
Fixed assets to capital	5/4
Fixed assets/Total current assets	5/7

Ans.

Workings:

(i) $\frac{\text{Fixed Assets}}{\text{Total Current Assets}} = \frac{5}{7}$

Or, Total Current Assets = $\frac{40,00,000 \times 7}{5}$ = ₹ 56,00,000

(ii) $\frac{\text{Fixed Assets}}{\text{Capital}} = \frac{5}{4}$

Or, Capital = $\frac{40,00,000 \times 4}{5}$ = ₹ 32,00,000

(iii) $\frac{\text{Capital}}{\text{Total Liabilities}^*} = \frac{1}{2}$

Or, Total liabilities = ₹ 32,00,000 × 2 = ₹ 64,00,000

*It is assumed that total liabilities do not include capital.

(iv) $\frac{\text{Net Profit}}{\text{Capital}} = \frac{1}{5}$

Or, Net Profit = ₹ 32,00,000 × 1/5 = ₹ 6,40,000

(v) $\frac{\text{Net Profit}}{\text{Sales}} = \frac{1}{5}$

Or, Sales = ₹ 6,40,000 × 5 = ₹ 32,00,000

(vi) Gross Profit = 25% of ₹ 32,00,000 = ₹ 8,00,000

(vii) Stock Turnover $= \frac{\text{Cost of Goods Sold } (\text{i.e. Sales} - \text{Gross profit})}{\text{Average Stock}} = 10$

$= \frac{32,00,000 - ` 8,00,000}{\text{Average Stock}} = 10$

Or, Average Stock = ₹ 2,40,000

Or, $\frac{\text{Opening Stock} + ` 4,00,000}{2}$ = ₹ 2,40,000

Or, Opening Stock = ₹ 80,000

Trading Account

Particulars	(₹)	Particulars	(₹)
To Opening Stock	80,000	By Sales	32,00,000
To Manufacturing exp./	27,20,000		

Purchase (Balancing figure)			
To Gross Profit b/d	8,00,000	By Closing Stock	4,00,000
	36,00,000		36,00,000

Profit and Loss Account

Particulars	(₹)	Particulars	(₹)
To Operating Expenses (Balancing figure)	1,60,000	By Gross Profit c/d	8,00,000
To Net Profit	6,40,000		
	8,00,000		8,00,000

Balance Sheet

Capital and Liabilities	(₹)	Assets	(₹)
Capital	32,00,000	Fixed Assets	40,00,000
Liabilities	64,00,000	Current Assets:	
		Closing Stock	4,00,000
		Other Current Assets (Bal. figure)	52,00,000
	96,00,000		96,00,000

Q.48 Financial Performance | ICAI MAT

ABC Company sells plumbing fixtures on terms of 2/10, net 30. Its financial statements over the last 3 years are as follows:

Particulars	*2020-21*	*2021-22*	*2022-23*
	₹	₹	₹
Cash	*30,000*	*20,000*	*5,000*
Accounts receivable	*2,00,000*	*2,60,000*	*2,90,000*
Inventory	*4,00,000*	*4,80,000*	*6,00,000*
	6,30,000	*7,60,000*	*8,95,000*
Net fixed assets	*8,00,000*	*8,00,000*	*8,00,000*
	14,30,000	*15,60,000*	*16,95,000*

	₹	₹	₹
Accounts payable	*2,30,000*	*3,00,000*	*3,80,000*
Accruals	*2,00,000*	*2,10,000*	*2,25,000*

Bank loan (short-term)	*1,00,000*	*1,00,000*	*1,40,000*
	5,30,000	*6,10,000*	*7,45,000*
Long-term debt	*3,00,000*	*3,00,000*	*3,00,000*
Common stock	*1,00,000*	*1,00,000*	*1,00,000*
Retained earnings	*5,00,000*	*5,50,000*	*5,50,000*
	14,30,000	*15,60,000*	*16,95,000*
	₹	₹	₹
Sales	*40,00,000*	*43,00,000*	*38,00,000*
Cost of goods sold	*32,00,000*	*36,00,000*	*33,00,000*
Net profit	*3,00,000*	*2,00,000*	*1,00,000*

Considering opening balance of Accounts Receivable and Inventory as 2,00,000 and 4,00,000 respectively as on 01.04.2020, ANALYSE the company's financial condition and performance over the last 3 years. Are there any problems?

Ans.

Ratios	2020-21	2021-22	2022-23
Current ratio (Current Assets / Current Liabilities)	1.19 $\left(\frac{6,30,000}{5,30,000}\right)$	1.25 $\left(\frac{7,60,000}{6,10,000}\right)$	1.20 $\left(\frac{8,95,000}{7,45,000}\right)$
Acid-test ratio (Quick Assets / Current Liabilities)	0.43 $\left(\frac{2,30,000}{5,30,000}\right)$	0.46 $\left(\frac{2,80,000}{6,10,000}\right)$	0.40 $\left(\frac{2,95,000}{7,45,000}\right)$
Receivables turnover ratio (Sales/ Average Receivables) (Refer Working Notes)	20 $\left(\frac{40,00,000}{2,00,000}\right)$	18.70 $\left(\frac{43,00,000}{2,30,000}\right)$	13.82 $\left(\frac{38,00,000}{2,75,000}\right)$
Average collection period (365 / Receivables turnover ratio)	18.25 (365/20)	19.52 (365/18.70)	26.41 (365/13.82)
Inventory turnover ratio (COGS / Average Inventory) (Refer Working Notes)	8 $\left(\frac{32,00,000}{4,00,000}\right)$	8.18 $\left(\frac{36,00,000}{4,40,000}\right)$	6.11 $\left(\frac{33,00,000}{5,40,000}\right)$
Total debt to net worth (Short term + Long term Debt) / (Common stock + Retained earnings)	1.38 $\left(\frac{8,30,000}{6,00,000}\right)$	1.40 $\left(\frac{9,10,000}{6,50,000}\right)$	1.61 $\left(\frac{10,45,000}{6,50,000}\right)$
Long-term debt to total capitalization	0.33	0.32	0.32

	$\left(\frac{3,00,000}{9,00,000}\right)$	$\left(\frac{3,00,000}{9,50,000}\right)$	$\left(\frac{3,00,000}{9,50,000}\right)$
Gross profit margin (Gross Profit / Sales) {Gross profit = Sales – Cost of Goods sold}	0.20 $\left(\frac{8,00,000}{40,00,000}\right)$	0.16 $\left(\frac{7,00,000}{43,00,000}\right)$	0.13 $\left(\frac{5,00,000}{38,00,000}\right)$
Net profit margin (Net Profit / Sales)	0.075 $\left(\frac{3,00,000}{40,00,000}\right)$	0.047 $\left(\frac{2,00,000}{43,00,000}\right)$	0.026 $\left(\frac{1,00,000}{38,00,000}\right)$
Total Asset turnover (Sales / Total Assets)	2.80 $\left(\frac{40,00,000}{14,30,000}\right)$	2.76 $\left(\frac{43,00,000}{15,60,000}\right)$	2.24 $\left(\frac{38,00,000}{16,95,000}\right)$
Return on assets (Net profit/ Total Assets)	0.21 $\left(\frac{3,00,000}{14,30,000}\right)$	0.13 $\left(\frac{2,00,000}{15,60,000}\right)$	0.06 $\left(\frac{1,00,000}{16,95,000}\right)$
Working Notes			
Average receivables {(Opening + closing)/2}	(₹ 2,00,000 + ₹ 2,00,000)/2 = ₹ 2,00,000	(₹ 2,00,000 + ₹ 2,60,000)/2 = ₹ 2,30,000	(₹ 2,60,000 + ₹ 2,90,000)/2 = ₹ 2,75,000
Average Inventory {(Opening + closing)/2}	(₹ 4,00,000 + ₹ 4,00,000)/2 = ₹ 4,00,000	(₹ 4,00,000 + ₹ 4,80,000)/2 = ₹ 4,40,000	(₹ 4,80,000 + ₹ 6,00,000)/2 = ₹ 5,40,000

Analysis: The current ratio and quick ratio are less than the ideal ratio (2:1 and 1:1 respectively) indicating that the company is not having enough resources to meet its current obligations.

Receivables are growing slower, although the average collection period is still very reasonable relative to the terms given. Inventory turnover is slowing as well, indicating a relative build-up in inventories. The increase in receivables and inventories, coupled with the fact that net worth has increased very little, has resulted in the total debt-to-net worth ratio increasing to what would have to be regarded on an absolute basis as a high level. Long-term debt to total capitalization has not changed relatively coupled with the fact that retained earnings of only ₹ 50,000 is made in year 2019-20, and there is no issuance of new long-term debt in year 2019-20 and 2020-21.

Both the gross profit and net profit margins have declined substantially. The relationship between the two suggests that the company has incurred more relative expenses. The build-up in inventories and receivables has resulted in a decline in the asset turnover ratio, and this, coupled with the decline in profitability, has resulted in a sharp decrease in the return on assets ratio.

Q.49 All Ratios | ICAI MAT

Following information are available for Navya Ltd. along with various ratios relevant to the particular industry it belongs to. APPRAISE your comments on strength and weakness of Navya Ltd. comparing its ratios

with the given industry norms.

Navya Ltd.

Balance Sheet as at 31.3.2023

Liabilities	(₹)	Assets	(₹)
Equity Share Capital	48,00,000	Fixed Assets	24,20,000
10% Debentures	9,20,000	Cash	8,80,000
Sundry Creditors	6,60,000	Sundry debtors	11,00,000
Bills Payable	8,80,000	Stock	33,00,000
Other current Liabilities	4,40,000		-
Total	77,00,000	Total	77,00,000

Statement of Profitability

For the year ending 31.3.2023

Particulars	(₹)	(₹)
Sales		1,10,00,000
Less: Cost of goods sold: Material	41,80,000	
Wages	26,40,000	
Factory Overhead	12,98,000	81,18,000
Gross Profit		28,82,000
Less: Selling and Distribution Cost	11,00,000	
Administrative Cost	12,28,000	23,28,000
Earnings before Interest and Taxes		5,54,000
Less: Interest Charges		92,000
Earning before Tax		4,62,000
Less: Taxes @ 50%		2,31,000
Net Profit (PAT)		2,31,000

Industry Norms

Ratios	Norm
Current Ratio	2.5
Receivables Turnover Ratio	8.0
Inventory Turnover Ratio (based on Sales)	9.0
Total Assets Turnover Ratio	2.0
Net Profit Ratio	3.5%
Return on Total Assets (on EBIT)	7.0%
Return on Net worth (Based on Net profit)	10.5%
Total Debt/Total Assets	60.0%

Ans.

Ratios	Navya Ltd.	Industry Norms
1. Current Ratio = $\frac{\text{Current Ass}}{\text{Current Liabilities}}$	$\frac{₹52,80,000}{₹19,80,000}$ = 2.67	2.50
2 Receivable Turnover Ratio = $\frac{\text{Sales}}{}$	$\frac{₹1,10,00,000}{}$ =10.0	8.00

	Debtors	₹11,00,000	
3.	Inventory turnover ratio = $\frac{\text{Sales}}{\text{Stock}}$	$\frac{₹1,10,00,000}{₹33,00,000}$ = 3.33	9.00
4.	Total Asset Turn over ratio = $\frac{\text{Sales}}{\text{Total Assets}}$	$\frac{₹1,10,00,000}{₹77,00,000}$ = 1.43	2.00
5	Net Profit Ratio = $\frac{\text{Net Profit}}{\text{Sales}}$	$\frac{₹2,31,000}{₹1,10,00,000}$ = 2.10%	3.50%
6.	Return on Total Asset = $\frac{\text{EBIT}}{\text{Total Assets}}$	$\frac{₹5,54,000}{₹77,00,000}$ = 7.19%	7%
7.	Return on Net worth = $\frac{\text{Net Profit}}{\text{Net Worth}}$	$\frac{₹2,31,000}{₹48,00,000}$ = 4.81%	10.5%
8.	$\frac{\text{Total Debt}}{\text{Total Assets}}$	$\frac{₹29,00,000}{₹77,00,000}$ = 37.66%	60%

Comments:

1. The position of Navya Ltd. is better than the industry norm with respect to Current Ratio and Receivables Turnover Ratio.
2. However, the Inventory turnover ratio and Total Asset Turnover ratio is poor comparing to industry norm indicating that company is inefficient to utilize its inventory and assets.
3. The firm also has its net profit ratio and return on net worth ratio much lower than the industry norm.
4. Total debt to total assets ratio is lower that the industry standard which suggests that the firm is less levered by debt and more by equity resulting in less risky company.

Q.50 Avg. Inventory | ICAI MAT

The total sales (all credit) of a firm are ₹ 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm's current liabilities are ₹ 96,000; inventories ₹ 48,000 and cash ₹ 16,000.

(a) DETERMINE the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume 360 days a year).

(b) DETERMINE the average collection period if the opening balance of debtors is intended to be of ₹ 80,000? (Assume 360 days a year).

Ans. (a) $\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.

Cost of goods sold = 0.85 × ₹ 6,40,000 = ₹ 5,44,000.

Thus, $= \frac{5,44,000}{\text{Average inventory}} = 5$

Average inventory $= \frac{5,44,000}{5}$ = ₹ 1,08,800

(b) $\text{Average collection period} = \frac{\text{Average Receivables}}{\text{Credit Sales}} \times 360\text{days}$

$\text{Average Receivables} = \frac{(\text{Opening Receivables} + \text{Closing Receivables})}{2}$

Closing balance of receivables is found as follows:

	₹	₹
Current assets (2.5 of current liabilities)		2,40,000
Less: Inventories	48,000	
Cash	16,000	64,000
Receivables		1,76,000

Average Receivables = $\frac{(`1,\ 76,\ 000\ +\ `\ 80,\ 000)}{2}$ = ₹ 1,28,000

So, Average collection period = $\frac{(1,\ 28,\ 000\ )}{6,40,000}$ ×360 = 72 days

Q.51 Balance Sheet | ICAI MAT

Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2023:

Sales	₹ 60,00,000
Return on net worth	25%
Rate of income tax	50%
Share capital to reserves	7:3
Current ratio	2
Net profit to sales	6.25%
Inventory turnover (based on cost of goods sold)	12
Cost of goods sold	₹ 18,00,000
Interest on debentures	₹ 60,000
Receivables	₹ 2,00,000
Payables	₹ 2,00,000

You are required to:

(a) CALCULATE the operating expenses for the year ended 31st March, 2023.

(b) PREPARE a Balance Sheet as on 31st March, 2023 in the following format:

Balance Sheet as on 31st March, 2023

Liabilities	₹	**Assets**	₹
Share Capital		Fixed Assets	
Reserve and Surplus		Current Assets	
15% Debentures		Stock	
Payables		Receivables	
		Cash	

Ans. **(a) Calculation of Operating Expenses for the year ended 31st March, 2023**

		(₹)
Net Profit [@ 6.25% of Sales]		3,75,000

Add: Income Tax (@ 50%)		3,75,000
Profit Before Tax (PBT)		7,50,000
Add: Debenture Interest		60,000
Profit before interest and tax (PBIT)		8,10,000
Sales		60,00,000
Less: Cost of goods sold	18,00,000	
PBIT	8,10,000	26,10,000
Operating Expenses		33,90,000

(b) Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
Share Capital	10,50,000	Fixed Assets	17,00,000
Reserve and Surplus	4,50,000	Current Assets:	
15% Debentures	4,00,000	Stock	1,50,000
Payables	2,00,000	Receivables	2,00,000
		Cash	50,000
	21,00,000		21,00,000

Working Notes:

(i) Share Capital and Reserves and Surplus

The return on net worth is 25%. Therefore, the profit after tax of ₹ 3,75,000 should be equivalent to 25% of the net worth.

Net worth x $\frac{25}{100}$ = ₹ 3,75,000

Net worth = $\frac{3,75,000}{25}$ × 100 = ₹ 15,00,000

The ratio of share capital to reserves is 7:3

Share Capital = 15,00,000 x $\frac{7}{10}$ = ₹ 10,50,000

Reserves and Surplus = 15,00,000 $\frac{3}{10}$ = ₹ 4,50,000

(ii) Debentures

Interest on Debentures @ 15% = ₹ 60,000

Debentures = $\frac{60,000 \times 100}{15}$ = ₹ 4,00,000

(iii) Current Assets

Current Ratio = 2

Payables = ₹ 2,00,000

Current Assets = 2 Current Liabilities = 2 x 2,00,000 = ₹ 4,00,000

(iv) Fixed Assets

	₹
Share capital	10,50,000
Reserves and Surplus	4,50,000
Debentures	4,00,000
Payables	2,00,000
	21,00,000
Less: Current Assets	4,00,000
Fixed Assets	17,00,000

(v) Composition of Current Assets

Inventory Turnover = 12

$$\frac{\text{Cost of goods sold}}{\text{Closing stock}} = 12$$

$$\text{Closing stock} = \frac{18,\ 00,\ 000}{12} = ₹\ 1,50,000$$

Composition	₹
Stock	1,50,000
Receivables	2,00,000
Cash (balancing figure)	50,000
Total Current Assets	4,00,000

Q.52 Balance Sheet | ICAI MAT

Using the following information, PREPARE the balance sheet:

Long-term debt to net worth	*0.5*
Total asset turnover	*2.5*
Average collection period₹*	*18 days*
Inventory turnover	*9*
Gross profit margin	*10%*
Acid-test ratio	*1*

Assume a 360-day year and all sales on credit.

	₹		₹
Cash	*?*	*Notes and payables*	*1,00,000*
Accounts receivable	*?*	*Long-term debt*	*?*
Inventory	*?*	*Common stock*	*1,00,000*
Plant and equipment	*?*	*Retained earnings*	*1,00,000*
Total assets	*?*	*Total liabilities and equity*	*?*

Ans. **Working Notes:**

(i) Long term Debt

$$0.5 = \frac{\text{Long – term debt}}{\text{Net worth}} = \frac{\text{Long – term debt}}{`1,00,000 + `1,00,000}$$

Long term debt = ₹ 1,00,000

(ii) Total assets

Total liabilities and Equity = Notes and payables + Long-term debt + Common stock + Retained earnings

= ₹ 1,00,000 + ₹ 1,00,000 + ₹ 1,00,000 + ₹ 1,00,000 = ₹ 4,00,000

Total assets = Total liabilities and Equity = ₹ 4,00,000

(iii) Sales and Cost of Goods sold

$$\text{Total asset turnover} = 2.5 = \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Sales}}{4,00,000}$$

Sales = ₹ 10,00,000

Cost of goods sold = (100% - Gross Profit margin) x Sales

= (100% - 10%) × ₹ 10,00,000 = ₹ 9,00,000.

(iv) Current Assets

$$\text{Inventory turnover} = 9 = \frac{\text{Costof goods sold}}{\text{Inventory}} = \frac{9,00,000}{\text{Inventory}}$$

Inventory = ₹ 1,00,000

$$\text{Average collection period} = 18 = \frac{\text{Receivables} \times 360}{\text{Sales}} = \frac{\text{Receivables} \times 360}{10,00,000}$$

Accounts receivables = ₹ 50,000

$$\text{Acid-test ratio} = 1 = \frac{\text{Cash} + \text{Accounts Receivable}}{\text{Notes and Payables}} = \frac{\text{Cash} + `50,000}{1,00,000}$$

Cash = ₹ 50,000

(v) Plant and equipment

= Total Assets - Current Assets

= ₹ 4,00,000 - (₹ 1,00,000 + ₹ 50,000 + ₹ 50,000) = ₹ 2,00,000

Balance Sheet

	₹		₹
Cash	50,000	Notes and payables Long-	1,00,000
Accounts receivable	50,000	term debt Common stock	1,00,000
Inventory	1,00,000	Retained earnings	1,00,000
Plant and equipment	2,00,000		1,00,000
Total assets	4,00,000	Total liabilities and equity	4,00,000

Q.53 All Ratios | ICAI MAT

Manan Pvt. Ltd. gives you the following information relating to the year ending 31st March, 2023:

(1)	Current Ratio	2.5 : 1
(2)	Debt-Equity Ratio	1 : 1.5
(3)	Return on Total Assets (After Tax)	15%
(4)	Total Assets Turnover Ratio	2
(5)	Gross Profit Ratio	20%
(6)	Stock Turnover Ratio	7
(7)	Net Working Capital	₹ 13,50,000
(8)	Fixed Assets	₹ 30,00,000
(9)	1,80,000 Equity Shares of	₹ 10 each
(10)	60,000, 9% Preference Shares of	₹ 10 each
(11)	Opening Stock	₹ 11,40,000

You are required to CALCULATE:

(a) Quick Ratio
(b) Fixed Assets Turnover Ratio
(c) Proprietary Ratio
(d) Earnings per Share

Ans. **Workings Notes:**

(i) Computation of Current Assets & Current Liabilities & Total Assets

Net Working Capital = Current Assets – Current Liabilities
= 2.5 – 1 = 1.5

Thus, Current Assets $= \frac{\text{NetWorking Capital} \times 2.5}{1.5}$

$= \frac{13,50,000 \times 25}{1.5}$

= ₹ 22,50,000

Current Liabilities (CL) = ₹ 22,50,000 – ₹ 13,50,000 = ₹ 9,00,000

Total Assets = Current Assets + Fixed Assets
= ₹ 22,50,000 + ₹ 30,00,000 = ₹ 52,50,000

(ii) Computation of Sales & Cost of Goods Sold

Sales = Total Assets Turnover × Total Assets
= 2 x (Fixed Assets + Current Assets)
= 2 × (₹ 30,00,000 + ₹ 22,50,000)
= ₹ 1,05,00,000

Cost of Goods Sold = (100% – 20%) of Sales = 80% of Sales
= 80% × ₹ 1,05,00,000 = ₹ 84,00,000

(iii) Computation of Stock & Quick Assets

Average Stock $= \frac{\text{Cost of Good Sold}}{\text{Stock Turnover Ratio}} = \frac{84,00,000}{7}$

$= 12,00,000$

Closing Stock = (Average Stock × 2) – Opening Stock
= (₹ 12,00,000 × 2) – ₹ 11,40,000
= ₹ 12,60,000

Quick Assets = Current Assets – Closing Stock
= ₹ 22,50,000 – ₹ 12,60,000 = ₹ 9,90,000

(iv) Computation of Proprietary Fund

Debt-Equity Ratio = $\frac{\text{Debt}}{\text{Equity}} = \frac{1}{1.5}$

Or, Equity = 1.5 Debt

Total Assets = Equity + Preference capital + Debt + CL

₹ 52,50,000 = 1.5 Debt+ ₹ 6,00,000 + Debt + ₹ 9,00,000

Thus, Debt = $\frac{37,50,000}{2.5}$ = ₹ 15,00,000

Equity = ₹ 15,00,000 × 1.5
= ₹ 22,50,000

So, Proprietary Fund = Equity + Preference Capital
= ₹ 22,50,000 + ₹ 6,00,000
= ₹ 28,50,000

(v) Computation of Profit after tax (PAT)

= Total Assets × Return on Total Assets
= ₹ 52,50,000 × 15%
= ₹ 7,87,500

(a) Quick Ratio

Quick Ratio = $\frac{\text{Quick Assets}}{\text{CurrentLiabilities}} = \frac{9,90,000}{9,00,000}$ = 1.1

(b) Fixed Assets Turnover Ratio

Fixed Assets Turnover Ratio = $\frac{\text{Sales}}{\text{FixedAssets}} = \frac{1,\ 05,\ 00,\ 000}{30,00,000}$ = 3.5

(c) Proprietary Ratio

Proprietary Ratio = $\frac{\text{Proprietary fund}}{\text{Total Assets}} = \frac{28,50,000}{52,50,000}$ = 0.54

(d) Earnings per Equity Share (EPS)

Earnings per Equity Share = $\frac{\text{PAT} - \text{Preference Share Dividend}}{\text{Number of Equity Shares}}$

= $\frac{`7,\ 87,500 - `54,\ 000\ (9\%\ \text{of}\ `6,\ 00,\ 000)}{1,80,000}$

= ₹ 4.075 per share

Q.54 Balance Sheet | ICAI MAT

Gig Ltd. has furnished the following information relating to the year ended 31st March, 2022 and 31st March, 2023:

	31st March, 2022 (₹)	31st March, 2023 (₹)
Share Capital	40,00,000	40,00,000
Reserve and Surplus	20,00,000	25,00,000
Long term loan	30,00,000	30,00,000

- Net profit ratio: 8%
- Gross profit ratio: 20%
- Long-term loan has been used to finance 40% of the fixed assets.
- Stock turnover with respect to cost of goods sold is 4.
- Debtors represent 90 days sales.
- The company holds cash equivalent to $1\frac{1}{2}$ months cost of goods sold.
- Ignore taxation and assume 360 days in a year.

You are required to PREPARE Balance Sheet as on 31st March, 2023 in the following format:

Liabilities	(₹)	Assets	(₹)
Share Capital	-	Fixed Assets	-
Reserve and Surplus	-	Sundry Debtors	-
Long-term loan	-	Closing Stock	-
Sundry Creditors	-	Cash in hand	-

Ans.

(i) Change in Reserve & Surplus = ₹ 25,00,000 – ₹ 20,00,000 = ₹ 5,00,000

So, Net profit = ₹ 5,00,000

Net Profit Ratio = 8%

Sales = $\frac{5,00,000}{8\%}$ =₹ 62,50,000

(ii) Cost of Goods sold

= Sales – Gross profit Margin

= ₹ 62,50,000 – 20% of ₹ 62,50,000

= ₹ 50,00,000

(iii) Fixed Assets = $\frac{30,00,000}{40\%}$ =₹ 75,00,000

(iv) Stock = $\frac{\text{Cost of Goods Sold}}{\text{Stock Turnover ratio}} = \frac{50,00,000}{4}$ = ₹12,50,000

(v) Debtors = $\frac{62,50,000}{360} \times 90$ = ₹15,62,500

(vi) Cash Equivalent = $\frac{50,00,000}{12} \times 1.5$ = ₹ 6,25,000

Balance Sheet as on 31st March 2023

Liabilities	(₹)	Assets	(₹)

Share Capital	40,00,000	Fixed Assets	75,00,000
Reserve and Surplus	25,00,000	Sundry Debtors	15,62,500
Long-term loan	30,00,000	Closing Stock	12,50,000
Sundry Creditors (Balancing Figure)	14,37,500	Cash in hand	6,25,000
	1,09,37,500		1,09,37,500

2 CHAPTER LEVERAGE

Q.1 EPS calculation | PY May 23

Following information is given for X Ltd.:

Total contribution (₹)	*4,25,000*
Operating leverage	*3.125*
15% Preference shares (₹ 100 each)	*1,000*
Number of equity shares	*2,500*
Tax rate	*50%*

Calculate EPS of X Ltd., if 40% decrease in sales will result EPS to zero.

Ans. (i) Operating Leverage (OL) = $\frac{\text{Contribution}}{\text{EBIT}}$ Or, 3.125 = $\frac{4,25,000}{\text{EBIT}}$

Or EBIT = ₹ 1,36,000

(ii) Degree of Combined Leverage (CL) = $\frac{\%\text{ Change in EPS}}{\%\text{ Change in Sales}} = \frac{100}{40} = 2.5$

(iii) Combined Leverage = OL × FL = 3.125 × FL

So, Financial Leverage = 2.5 /3.125 = 0.8

(iv) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{1,36,000}{\text{EBT}} = 0.8$

So, EBT = $\frac{1,36,000}{0.80}$ = ₹ 1,70,000

Calculation of EPS of X Ltd

Particulars	(₹)
EBT	1,70,000
Less: Tax (50%)	85,000
EAT	85,000
Preference Dividend	15,000
Net Earnings for Equity Shareholders	70,000
Number of equity shares	2,500
EPS	**28**

Q.2 PL Statement | PY Nov 22

The following information is available for SS Ltd.

Profit volume (PV) ratio	30%
Operating leverage	2.00
Financial leverage	1.50
Loan	₹ 1,25,000
Post-tax interest rate	5.6%
Tax rate	30%
Market Price per share (MPS)	₹ 140
Price Earnings Ratio (PER)	10

You are required to:

(1) Prepare the Profit-Loss statement of SS Ltd. and

(2) Find out the number of equity shares.

Ans. **(1) Preparation of Profit – Loss Statement**

Working Notes:

1.

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

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

$$1.5 = \left[\frac{EBIT}{(EBIT - 10,000)}\right]$$

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

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

Contribution = ₹ 60,000

3., **Fixed cost** = Contribution – Profit

= 60,000 – 30,000 = ₹ 30,000

4., Sales $= \frac{\text{Contribution}}{\text{PV Ratio}}$

$= \frac{60,000}{30\%}$ = ₹ 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% EAT	6,000
	14,000

(2) Calculation of no. of Equity shares

Market Price per Share (MPS) = ₹140

Price Earnings Ratio (PER) = 10

WKT,

$$\textbf{EPS} = \frac{MPS}{PER} = \frac{140}{10} = ₹\ 14$$

Total earnings (EAT) = ₹ 14,000

No. of Equity Shares = 14,000 / 14 = **1000**

Q.3 ROCE / EPS / OL / FL / CL | PY May 22

Details of a company for the year ended 31st March, 2022 are given below:

Sales	*₹ 86 lakhs*
Profit Volume (P/V) Ratio	*35%*
Fixed Cost excluding interest expenses	*₹ 10 lakhs*
10% Debt	*₹ 55 lakhs*
Equity Share Capital of ₹ 10 each	*₹ 75 lakhs*
Income Tax Rate	*40%*

Required:

(i) Determine company's Return on Capital Employed (Pre-tax) and EPS.

(ii) Does the company have a favourable financial leverage?

(iii) Calculate operating and combined leverages of the company.

(iv) Calculate percentage change in EBIT, if sales increases by 10%.

(v) At what level of sales, the Earning before Tax (EBT) of the company will be equal to zero?

Ans.

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) $= \frac{\text{EBIT}}{\text{Capital employed}} \times 100 = \frac{\text{EBIT}}{\text{Equity + Debt}} \times 100$

$= \frac{20,10,000}{(75,00,000 + 55,00,000)} \times 100 =$ **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 $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{30,10,000}{20,10,000} =$ **1.497 (approx.)**

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

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

Or, = Operating Leverage × Financial Leverage = 1.497 × 1.37 7 = **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.

Q.4 % change in EPS / PL / FL / CL | PY Dec 21

Information of A Ltd. is given below:

- Earnings after tax: 5% on sales
- Income tax rate: 50%
- Degree of Operating Leverage: 4 times
- 10% Debenture in capital structure: ₹ 3 lakhs
- Variable costs: ₹ 6 lakhs

Required:

(i) From the given data complete following statement:

Sales	XXXX
Less: Variable costs	₹ 6,00,000
Contribution	XXXX
Less: Fixed costs	XXXX
EBIT	XXXX

Less: Interest expenses	*XXXX*
EBT	*XXXX*
Less: Income tax	*XXXX*
EAT	*XXXX*

(ii) Calculate Financial Leverage and Combined Leverage.

(iii) Calculate the percentage change in earning per share, if sales increased by 5%.

Ans. **(i)** **Working Notes**

Earning 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, $\frac{\text{Contribution}}{\text{EBIT}} = 4$

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 × Financial Leverage

= 4 x 1.25 = 5 times

Or,

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

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

(iii) Percentage Change in Earnings per share

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

% Change in EPS = 25%

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

Q.5 EPS / OL / FL / CL | PY May 21

A company had the following balance sheet as on 31st March, 2021:

Liabilities	*₹ in Crores*	*Assets*	*₹ in Crores*
Equity Share Capital (75 lakhs Shares of ₹ 10 each)	*7.50*	*Building*	*12.50*
Reserves and Surplus	*1.50*	*Machinery*	*6.25*
15% Debentures	*15.00*	*Current Assets*	
Current Liabilities	*6.00*	*Stock*	*3.00*
		Debtors	*3.25*
		Bank Balance	*5.00*
	30.00		*30.00*

The additional information given is as under:

Fixed cost per annum (excluding interest)	₹ 6 crores
Variable operating cost ratio	60%
Total assets turnover ratio	2.5
Income-tax rate	40%

Calculate the following and comment:

(i) Earnings per share

(ii) Operating Leverage

(iii) Financial Leverage

(iv) Combined Leverage

Ans.

Total Assets = ₹ 30 crores

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = 30 x 2.5 = ₹ 75 crores

Computation of Profit after Tax (PAT)

Particulars	**(₹ in crores)**
Sales	75.00

Less: Variable Operating Cost @ 60%	45.00
Contribution	30.00
Less: Fixed Cost (other than Interest)	6.00
EBIT/PBIT	24.00
Less: Interest on Debentures (15% □ 15)	2.25
EBT/PBT	21.75
Less: Tax @ 40%	8.70
EAT/ PAT	13.05

(i) Earnings per Share

$$EPS = \frac{PAT}{Numberof\ Equity\ Shares} = \frac{13.05}{0.75} = ₹\ 17.40$$

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 an indicator used in comparing firms within an industry or industry segment.

(ii) Operating Leverage

$$Operating\ Leverage = \frac{Contribution}{EBIT} = \frac{30}{24} = 1.25$$

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

$$Financial\ Leverage = \frac{EBIT}{PBT} = \frac{24}{21.75} = 1.103$$

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

(iv) Combined Leverage

$$Combined\ Leverage = \frac{Contribution}{PBT} = \frac{30}{21.75} = 1.379$$

Or,
= Operating Leverage × Financial Leverage
= 1.25 x 1.103 = 1.379
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 used as measurement of risk.

Q.6 EPS / OL / CL | PY Jan 21

The information related to XYZ Company Ltd. for the year ended 31st March, 2020 are as follows:

Equity Share Capital of ₹ 100 each	₹ 50 Lakhs
12% Bonds of ₹ 1000 each	₹ 30 Lakhs
Sales	₹ 84 Lakhs
Fixed Cost (Excluding Interest)	₹ 7.5 Lakhs
Financial Leverage	1.39
Profit-Volume Ratio	25%
Market Price per Equity Share	₹ 200

Income Tax Rate Applicable 30%

You are required to compute the following:
(i) Operating Leverage
(ii) Combined Leverage
(iii) Earning per share
(iv) Earning Yield

Ans. **Workings:**

1. Profit Volume Ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

So, $25 = \frac{\text{Contribution}}{84,00,000} \times 100$

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

2. Financial leverage $= \frac{\text{EBIT}}{\text{EBT}}$

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

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 $= \frac{\text{Contribution}}{\text{Earningsbefore interest and tax (EBIT)}}$

$= \frac{21,00,000}{13,50,000} = 1.556$ (approx.)

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

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

(iii) Earnings per Share (EPS)

$\text{EPS} = \frac{\text{PAT}}{6,79,856} = ₹\ 13.597$

No. of shares = 50,000

(iv) Earning Yield

$$= \frac{\text{EPS}}{\text{Market Price}} \times 100 = \frac{13.597}{200} \times 100 = \textbf{6.80\% (approx.)}$$

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.

Q.7 % change in EBIT | PY Nov 20

The following data is available for Stone Ltd. : (₹)

Sales	5,00,000
(-) Variable cost @ 40%	2,00,000
Contribution	3,00,000
(-) Fixed cost	2,00,000
EBIT	1,00,000
(-) Interest	25,000
Profit before tax	75,000

Using the concept of leverage, find out
(i) The percentage change in taxable income if EBIT increases by 10%.
(ii) The percentage change in EBIT if sales increases by 10%.
(iii) The percentage change in taxable income if sales increases by 10%.
Also verify the results in each of the above case.

Ans. (i) Degree of Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{1,00,000}{75,000}$ = 1.333 times

So, If EBIT increases by 10% then Taxable Income (EBT) will be increased by 1.333 × 10 = 13.33% (approx.)

Verification

Particulars	Amount (₹)
New EBIT after 10% increase (₹ 1,00,000 + 10%)	1,10,000
Less: Interest	25,000
Earnings before Tax after change (EBT)	85,000

Increase in Earnings before Tax = ₹ 85,000 - ₹ 75,000 = ₹ 10,000

So, percentage change in Taxable Income (EBT) = $\frac{1,00,000}{75,000} \times 100$ = 13.333%, hence verified

(ii) Degree of Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{3,00,000}{1,00,000}$ = 3 times

So, if sale is increased by 10% then EBIT will be increased by 3 × 10 = 30%

Verification

Particulars	Amount (₹)
New Sales after 10% increase (₹ 5,00,000 + 10%)	5,50,000
Less: Variable cost (40% of ₹ 5,50,000)	2,20,000
Contribution	3,30,000
Less: Fixed costs	2,00,000

Earnings before interest and tax after change (EBIT)	1,30,000

Increase in Earnings before interest and tax (EBIT) = ₹ 1,30,000 - ₹ 1,00,000 = ₹ 30,000

So, percentage change in EBIT = $\frac{30,000}{1,00,000}$ x 100 = 30%, hence verified.

(iii) Degree of Combined Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$ = $\frac{3,00,000}{75,000}$ = 4 times

So, if sale is increased by 10% then Taxable Income (EBT) will be increased by 4 × 10 = 40%

Verification

Particulars	Amount (₹)
New Sales after 10% increase (₹ 5,00,000 + 10%)	5,50,000
Less: Variable cost (40% of ₹ 5,50,000)	2,20,000
Contribution	3,30,000
Less: Fixed costs	2,00,000
Earnings before interest and tax (EBIT)	1,30,000
Less: Interest	25,000
Earnings before tax after change (EBT)	1,05,000

Increase in Earnings before tax (EBT) = ₹ 1,05,000 - ₹ 75,000 = ₹ 30,000

So, percentage change in Taxable Income (EBT) = $\frac{30,000}{75,000}$ x 100 = 40%, hence verified

Q.8 EBIT / OL / FL / CL | PY Nov 19

The Balance Sheet of Gitashree Ltd. is given below:

Liabilities		*(₹)*
Shareholders' fund		
Equity share capital of ₹ 10 each	*₹ 1,80,000*	
Retained earnings	*₹ 60,000*	*2,40,000*
Non-current liabilities 10% debt		*2,40,000*
Current liabilities		*1,20,000*
		6,00,000
Assets		
Fixed Assets		*4,50,000*
Current Assets		*1,50,000*
		6,00,000

The company's total asset turnover ratio is 4. Its fixed operating cost is ₹ 2,00,000 and its variable operating cost ratio is 60%. The income tax rate is 30%.

Calculate:

(i) (a) Degree of Operating leverage.

(b) Degree of Financial leverage.

(c) Degree of Combined leverage.

(ii) Find out EBIT if EPS is (a) ₹ 1 (b) ₹ 2 and (c) ₹ 0.

Ans.

Working Notes:

Total Assets = ₹ 6,00,000

Total Asset Turnover Ratio i.e. = $\frac{\text{Total Sales}}{\text{Total Assets}}$ = 4

Hence, Total Sales = ₹ 6,00,000 x 4 = ₹ 24,00,000

Computation of Profits after Tax (PAT)

Particulars	(₹)
Sales	24,00,000
Less: Variable operating cost @ 60%	14,40,000
Contribution	9,60,000
Less: Fixed operating cost (other than Interest)	2,00,000
EBIT (Earning before interest and tax)	7,60,000
Less: Interest on debt (10% ₹ 2,40,000)	24,000
EBT (Earning before tax)	7,36,000
Less: Tax 30%	2,20,800
EAT (Earning after tax)	5,15,200

(i) (a) Degree of Operating Leverage

Degree of Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}} = ₹\frac{9,60,000}{7,60,000}$ = 1.263 (approx.)

(b) Degree of Financial Leverage

Degree of Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{9,60,000}{7,60,000}$ = 1.033 (approx.)

(c) Degree of Combined Leverage

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

$= \frac{9,60,000}{7,60,000}$ = 1.304 (approx.)

Or

Degree of Combined Leverage = Degree of Operating Leverage x Degree of Financial Leverage
= 1.263 x 1.033 = 1.304 (approx.)

(ii) (a) If EPS is Re. 1

$EPS = \frac{(EBIT - Interest)(1 - tax)}{No of equity shares}$

Or, $1 = \frac{(EBIT - ₹ 24,000)(1 - 0.30)}{18,000}$

Or, EBIT = ₹ 49,714 (approx.)

(b) If EPS is ₹ 2

$$2 = \frac{(EBIT - ₹\ 24,000)\ (1 - 0.30)}{18,000}$$

Or, EBIT = ₹ 75,429 (approx.)

(c) If EPS is ₹ 0

$$0 = \frac{(EBIT - ₹\ 24,000)\ (1 - 0.30)}{18,000}$$

Or, EBIT = ₹ 24,000

Alternatively, if EPS is 0 (zero), EBIT will be equal to interest on debt i.e. ₹ 24,000.

Q.9 % change in EPS / OL / FL | PY May 19

The capital structure of the Shiva Ltd. consists of equity share capital of ₹ 20,00,000 (Share of ₹ 100 per value) and ₹ 20,00,000 of 10% Debentures, sales increased by 20% from 2,00,000 units to 2,40,000 units, the selling price is ₹ 10 per unit; variable costs amount to ₹ 6 per unit and fixed expenses amount to ₹ 4,00,000. The income tax rate is assumed to be 50%.

(a) You are required to calculate the following:

(i) The percentage increase in earnings per share;

(ii) Financial leverage at 2,00,000 units and 2,40,000 units.

(iii) Operating leverage at 2,00,000 units and 2,40,000 units.

(b) Comment on the behaviour of operating and Financial leverages in relation to increase in production from 2,00,000 units to 2,40,000 units.

Ans. **(a)**

Sales in units	2,00,000 (₹)	2,40,000 (₹)
Sales Value @ ₹ 10 Per Unit	20,00,000	24,00,000
Variable Cost @ ₹ 6 per unit	(12,00,000)	(14,40,000)
Contribution	8,00,000	9,60,000
Fixed expenses	(4,00,000)	(4,00,000)
EBIT	4,00,000	5,60,000
Debenture Interest	(2,00,000)	(2,00,000)
EBT	2,00,000	3,60,000
Tax @ 50%	(1,00,000)	(1,80,000)
Profit after tax (PAT)	1,00,000	1,80,000
No of Share	20,000	20,000
Earnings per share (EPS)	5	9
(i)The percentage Increase in **EPS**		$\frac{4}{5} \times 100 = 80\%$
(ii) **Financial Leverage** = $\frac{EBIT}{EBT}$	$\frac{4,00,000}{2,00,000} = 2$	$\frac{₹\ 5,60,000}{₹\ 3,60,000} = 1.56$

(iii) **Operating leverage**= $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{8,00,000}{4,00,000}$ =2	$\frac{9,60,000}{5,60,000}$ =1.71

(b) When production is increased from 2,00,000 units to 2,40,000 units both financial leverage and operating leverages reduced from 2 to 1.56 and 1.71 respectively. Reduction in financial leverage and operating leverages signifies reduction in business risk and financial risk.

Q.10 PL / OL / FL / CL | PY Nov 18

Following is the Balance Sheet of Soni Ltd. as on 31st March, 2018 :

Liabilities	*Amount in ₹*
Shareholder's Fund	
Equity Share Capital (₹ 10 each)	*25,00,000*
Reserve and Surplus	*5,00,000*
Non-Current Liabilities (12 Debentures)	*50,00,000*
Current Liabilities	*20,00,000*
Total	***1,00,00,000***
Assets	***Amount in ₹***
Non-Current Assets	*60,00,000*
Current Assets	*40,00,000*
Total	***1,00,00,000***

Additional Information:

(i) Variable Cost is 60% of Sales.

(ii) Fixed Cost p.a. excluding interest ₹ 20,00,000.

(iii) Total Asset Turnover Ratio is 5 times.

(iv) Income Tax Rate 25%

You are required to:

(1) Prepare Income Statement

(2) Calculate the following and comment:

(a) Operating Leverage

(b) Financial Leverage

(c) Combined Leverage

Ans.

Workings:-

Total Assets = ₹ 1 crore

Total Asset Turnover Ratio i.e. $\frac{\text{Total Sales}}{\text{Total Assets}}$ = 5

Hence, Total Sales = ₹ 1 Crore x 5 = ₹ 5 crore

(1) Income Statement

	(₹ in crore)
Sales	5
Less: Variable cost @ 60%	3
Contribution	2

Less: Fixed cost (other than Interest)	0 .2
EBIT (Earnings before interest and tax)	1.8
Less: Interest on debentures (12% □ 50 lakhs)	0 .06
EBT (Earning before tax)	1.74
Less: Tax 25%	0.435
EAT (Earning after tax)	1.305

(2) (a) Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{2}{1.8} = 1.11$$

It indicates fixed cost in cost structure. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(b) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{1.8}{1.74} = 1.03$$

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

(c) Combined Leverage

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = 1.11 \times 1.03 = 1.15$$

$$\text{Or } \frac{\text{Contribution}}{\text{EBIT}} = \frac{2}{1.74} = 1.15$$

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.

Q.11 FL / PV Ratio | PY May 18

The following data have been extracted from the books of LM Ltd: Sales - ₹100 lakhs
Interest Payable per annum - ₹ 10 lakhs
Operating leverage - 1.2
Combined leverage - 2.16
You are required to calculate:
(i) The financial leverage,
(ii) Fixed cost and
(iii) P/V ratio

Ans. **(i) Calculation of Financial Leverage:**
Combined Leverage (CL) = Operating Leverage (OL) x Financial Leverage (FL)
2.16 = 1.2 x FL
FL = 1.8

(ii) Calculation of Fixed cost:

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBTi.e EBIT} - \text{Interest}}$$

$$1.8 = \frac{\text{EBIT}}{\text{EBIT} - 10,00,000}$$

1.8 (EBIT – 10,00,000) = EBIT
1.8 EBIT - 18,00,000 = EBIT

$$EBIT = \frac{18,00,000}{0.8} = ₹\ 22,50,000$$

Further, Operating Leverage = $\frac{Contribution}{EBIT}$

$$1.2 = \frac{Contribution}{22,50,000}$$

Contribution = ₹ 27,00,000

Fixed Cost = Contribution – EBIT
= ₹ 27, 00,000 – ₹ 22,50,000
Fixed cost = ₹ 4,50,000

(iii) Calculation of P/V ratio:

$$P/V\ ratio = \frac{Contribution(C)}{Sales(S)} \times 100 = \frac{27,00,000}{100,00,000} \times 100 = 27\%$$

Q.12 EPS / OL / FL | RTP Nov 23

The capital structure of ABC Ltd. for the year ended 31st March 2022 consisted as follows:

Particulars	Amount in ₹
Equity share capital (face value ₹ 100 each)	20,00,000
10% debentures (₹ 100 each)	20,00,000

During the year 2021-22, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 15 per unit and variable cost at ₹ 10 per unit for both the years. The fixed expenses were at ₹ 2,00,000 p.a. and the income tax rate is 30%.
You are required to CALCULATE the following:
(a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.
(b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.
(c) The percentage change in EPS.

Ans.

Sales in units	1,20,000 (₹)	1,00,000 (₹)
Sales Value	18,00,000	15,00,000
Variable Cost	(12,00,000)	(10,00,000)
Contribution	6,00,000	5,00,000
Fixed expenses	(2,00,000)	(2,00,000)
EBIT	4,00,000	3,00,000
Debenture Interest	(2,00,000)	(2,00,000)
EBT	2,00,000	1,00,000
Tax @ 30%	(60,000)	(30,000)
Profit after tax (PAT)	1,40,000	70,000
(i) Financial Leverage= $\frac{EBIT}{EBT}$	$= \frac{4,00,000}{2,00,000} = 2$	$= \frac{3,00,000}{1,00,000} = 3$

(ii) Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{6,00,000}{4,00,000}$ = 1.50	= $\frac{5,00,000}{3,00,000}$ = 1.67
(iii) Earnings per share (EPS)	$\frac{1,40,000}{20,000}$ = 7	$\frac{70,000}{20,000}$ = ₹ 3.5
Decrease in EPS	= ₹ 7 – ₹ 3.5 = ₹ 3.5	
% decrease in EPS	$\frac{3.5}{7}$ = x 100 = 50%	

Q.13 PL Statement | RTP May 23

The selected financial data for A, B and C companies for the current year ended 31st March are as follows:

Particulars	A	B	C
Variable Expenses as a % of sales	60	50	40
Interest	₹ 1,00,000	₹ 4,00,000	₹ 6,00,000
Degree of Operating Leverage	4:1	3:1	2.5:1
Degree of Financial Leverage	3:1	5:1	2.5:1
Income Tax Rate	30%	30%	30%

(a) PREPARE income statement for A, B and C companies

(b) COMMENT on the financial position and structure of these companies

Ans.

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 = $\frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$

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

$\text{EBIT} = \frac{\text{int x DFL}}{\text{DFL} - 1}$

For A,

$\text{EBIT}_A = \frac{1,00,000 \times 3}{3 - 1}$

EBIT_A = ₹150000

For B

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

EBITB = ₹500000

For C

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

$EBIT_c$ =10,00,000

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

Contribution = DOL x EBIT

$Contribution_A$ = 4 x ₹1,50,000

$Contribution_A$ = ₹6,00,000

$Contribution_B$ = 3 x ₹5,00,000

$Contribution_B$ = ₹15,00,000

$Contribution_C$ = 2.5 x ₹10,00,000

$Contribution_C$ = ₹25,00,000

(iii) Fixed Cost = Contribution – EBIT

Fixed $Cost_A$= ₹6,00,000 – ₹1,50,000 = ₹4,50,000

Fixed $Cost_B$ =₹15,00,000 – ₹5,00,000 = ₹10,00,000

Fixed $Cost_C$ = ₹25,00,000 – ₹10,00,000 = ₹15,00,000

(iv) Contribution = Sales – VC

VC= Sales – Contribution

Sales x VC Ratio= Sales – Contribution

Contribution= Sales – Sales x VC Ratio

Contribution=Sales(1-VCR)

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

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

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

$Sales_C$ = ₹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.

Q.14 EPS / FL | RTP Nov 22

Debu Ltd. currently has an equity share capital of ₹ 1,30,00,000 consisting of 13,00,000 Equity shares. The company is going through a major expansion plan requiring to raise funds to the tune of ₹ 78,00,000. To finance the expansion the management has following plans:

Plan-I : Issue 7,80,000 Equity shares of ₹ 10 each.

Plan-II : Issue 5,20,000 Equity shares of ₹ 10 each and the balance through long-term borrowing at 12% interest p.a.

Plan-III : Issue 3,90,000 Equity shares of ₹ 10 each and 39,000, 9% Debentures of ₹ 100 each.

Plan-IV : Issue 3,90,000 Equity shares of ₹ 10 each and the balance through 6% preference shares.

EBIT of the company is expected to be ₹ 52,00,000 p.a.
Considering corporate tax rate @ 40%, you are required to-
(i) CALCULATE EPS in each of the above plans.
(ii) ASCERTAIN financial leverage in each plan and comment.

Ans.

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 $\left(\frac{EBIT}{EBT}\right)$	1.00	1.06	1.07	1.08*

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

$\left(\frac{52,00,000}{(52,00,000 - 0) - \left(\frac{2,34,000}{(1-40)}\right)}\right) = \left(\frac{52,00,000}{48,10,000}\right) = 1.08$

Q.15 PL Statement | RTP May 22

Company P and Q are having same earnings before tax. However, t he margin of safety of Company P is 0.20 and, for Company Q, is 1.25 times than that of Company P. The interest expense of Company P is ₹ 1,50,000 and, for

Company Q, is 1/3rd less than that of Company P. Further, the financial leverage of Company P is 4 and, for Company Q, is 75% of Company P.

Other information is given as below:

Particulars	Company P	Company Q
Profit volume ratio	25%	33.33%
Tax rate	45%	45%

You are required to PREPARE Income Statement for both the companies.

Ans.

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 EBIT	= ₹ 3,00,000
Contribution	**= ₹ 1,50,000**

(v) For Company A

Operating Leverage

= 1/Margin of Safety

Operating Leverage	= 1/0.20 = 5
5	= Contribution/EBIT
Contribution	= Contribution/₹ 2,00,000
For Company B	= ₹ 10,00,000
Operating Leverage	
	= 1/Margin of Safety
Operating Leverage	= 1/0.25 = 4
4	= Contribution/EBIT
Contribution	= Contribution/₹ 1,50,000
Sales	= ₹ 6,00,000

(vi) **For Company A**

Profit Volume Ratio	= 25%
Profit Volume Ratio	= Contribution/Sales 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

Q.16 Raise money by Equity or Debt | RTP Dec 21

The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

Output	1,00,000 units at normal
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March, 2021 is as follows:

Particulars	₹
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	**30,00,000**

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹ 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

(i) Entirely by equity shares of ₹ 10 each at par.

(ii) ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.

(iii) Entirely by 6% debentures of ₹ 100 each at par.

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the

risk and return involved, assuming a corporate tax of 40%.

Ans. **Statement showing Profitability of Alternative Schemes for Financing**

(₹ in '00,000)

Particulars	Existing	Alternative Schemes		
		(i)	(ii)	(iii)
Equity Share capital (existing)	10	10	10	10
New issues	-	10	5	-
	10	**20**	**15**	**10**
7% debentures	10	10	10	10
6% debentures	-	-	5	10
	20	**30**	**30**	**30**
Debenture interest (7%)	0.7	0.7	0.7	0.7
Debenture interest (6%)	-	-	0.3	0.6
	0.7	**0.7**	**1.0**	**1.3**
Output (units in lakh)	1	1.5	1.5	1.5
Contribution per. unit (₹) (Selling price - Variable Cost)	**20**	**22**	**22**	**22**
Contribution (₹ lakh)	**20**	**33**	**33**	**33**
Less: Fixed cost	10	15	15	15
EBIT	**10**	**18**	**18**	**18**
Less: Interest (as calculated above)	0.7	0.7	1.0	1.3
EBT	**9.3**	**17.3**	**17**	**16.7**
Less: Tax (40%)	3.72	6.92	6.8	6.68
EAT	**5.58**	**10.38**	**10.20**	**10.02**
Operating Leverage (Contribution /EBIT)	**2.00**	**1.83**	**1.83**	**1.83**
Financial Leverage (EBIT/EBT)	**1.08**	**1.04**	**1.06**	**1.08**
Combined Leverage (Contribution/EBT)	**2.15**	**1.91**	**1.94**	**1.98**
EPS (EAT/No. of shares) (₹)	**5.58**	**5.19**	**6.80**	**10.02**
Risk	-	**Lowest**	**Lower than option (3)**	**Highest**
Return	-	**Lowest**	**Lower than option (3)**	**Highest**

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (iii) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (ii). Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., ₹ 10.02 per share) will be also in option (iii).

So, if Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of ₹ 6.80 per share. In case of alternative (i), EPS is even lower than the existing option, hence not recommended.

Q.17 % change in EBIT | RTP Jul 21

Following information has been extracted from the accounts of newly incorporated Textyl Pvt. Ltd. for the Financial Year 2020-21:

Sales	₹ 15,00,000
P/V ratio	70%
Operating Leverage	1.4 times
Financial Leverage	1.25 times

Using the concept of leverage, find out and verify in each case:

(i) The percentage change in taxable income if sales increase by 15%.

(ii) The percentage change in EBIT if sales decrease by 10%.

(iii) The percentage change in taxable income if EBIT increase by 15%.

Ans. **Workings:**

1. Contribution = Sales x P/V ratio
   = ₹ 15,00,000 x 70% = ₹ 10,50,000

2. Operating Leverage $= \frac{\text{Contribution}}{\text{Earningsbefore interest and tax (EBIT)}}$

   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 $= \frac{\text{Contribution}}{EBIT} = \frac{10,50,000}{6,00,000} = 1.75$ 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) = $\frac{1,57,500}{6,00,000} \times 100$ = **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 = $\frac{1,57,500}{7,50,000} \times 100$ = 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) = $\frac{1,12,500}{6,00,000} \times 100$ = **18.75%, hence verified.**

Q.18 EPS / OL / FL | RTP Nov 20

The capital structure of PS Ltd. for the year ended 31st March, 2020 consisted as follows:

Particulars	Amount in ₹
Equity share capital (face value ₹ 100 each)	10,00,000
10% debentures (₹ 100 each)	10,00,000

During the year 2019-20, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 12 per unit and variable cost at ₹ 8 per unit for both the years. The fixed expenses were at ₹ 2,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.

(b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.

(c) The percentage change in EPS.

Ans.

Sales in units	1,20,000 (₹)	1,00,000 (₹)
Sales Value	14,40,000	12,00,000
Variable Cost	(9,60,000)	(8,00,000)
Contribution	4,80,000	4,00,000
Fixed expenses	(2,00,000)	(2,00,000)
EBIT	2,80,000	2,00,000
Debenture Interest	(1,00,000)	(1,00,000)
EBT	1,80,000	1,00,000
Tax @ 30%	(54,000)	(30,000)
Profit after tax (PAT)	1,26,000	70,000
(i) Financial Leverage= EBIT / EBT	= ₹2,80,000 / ₹1,80,000 = 1.56	= ₹2,00,000 / ₹1,00,000 = 2
(ii) Operating leverage = Contribution / EBIT	₹4,80,000 / ₹2,80,000 = 1.71	= ₹4,00,000 / ₹2,00,000 = 2
(iii) Earnings per share (EPS)	₹1,26,000 / ₹10,000 = ₹ 12.6	₹70,000 / ₹10,000 = ₹ 7
Decrease in EPS	= ₹ 12.6 - ₹ 7 = ₹ 5.6	
% decrease in EPS	= 5.6 / 12.6 X 100 = 44.44%	

Q.19 EPS / OL / CL | RTP May 20

The following information is related to YZ Company Ltd. for the year ended 31st March, 2020:

Equity share capital (of ₹ 10 each)	₹ 50 lakhs
12% Bonds of ₹ 1,000 each	₹ 37 lakhs
Sales	₹ 84 lakhs
Fixed cost (excluding interest)	₹ 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55% Income
Tax Applicable	40%

You are required to CALCULATE:

(i) Operating Leverage;

(ii) Combined leverage; and

(iii) Earnings per share.

Show calculations up-to two decimal points.

Ans. **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% ₹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:

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{23,14,200}{16,18,200} = 1.43$$

(ii) Combined Leverage:

= Operating Leverage × Financial Leverage

= 1.43 1.49 = 2.13

Or,

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

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

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

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

Accordingly, other fixed interest

= ₹ 16,18,200 - ₹ 10,86,040 - ₹ 4,44,000 = ₹ 88,160

(iii) Earnings per share (EPS):

$$= \frac{\text{PAT}}{\text{No.ofshares outstanding}} = \frac{6,51,624}{5,00,000\text{equity shares}} = ₹ 1.30$$

Q.20 OL & Beta theory | RTP Nov 19

The following summarises the percentage changes in operating income, percentage changes in revenues, and betas for four listed firms.

Firm	Change in revenue	Change in operating income	Beta
A Ltd.	35%	22%	1.00
B Ltd.	24%	35%	1.65
C Ltd.	29%	26%	1.15
D Ltd.	32%	30%	1.20

Required:

(i) CALCULATE the degree of operating leverage for each of these firms. Comment also.

(ii) Use the operating leverage to EXPLAIN why these firms have different beta.

Ans. (i) Degree of operating leverage = $\frac{\%\text{Change in Operating income}}{\%\text{Change in Revenues}}$

A Ltd.	=	0.22 / 0.35	=	0.63
B Ltd.	=	0.35 / 0.24	=	1.46
C Ltd.	=	0.26 / 0.29	=	0.90
D Ltd.	=	0.30 / 0.32	=	0.94

It is level specific.

(ii) High operating leverage leads to high beta. So when operating leverage is lowest i.e. 0.63, Beta is minimum (1) and when operating leverage is maximum i.e. 1.46, beta is highest i.e. 1.65

Q.21 EPS / OL / FL / CL | RTP May 19

A Company had the following Balance Sheet as on March 31, 2019:

Equity and Liabilities	(₹ in crore)	Assets	(₹ in crore)
Equity Share Capital (10 crore shares of ₹ 10 each)	100	Fixed Assets (Net)	250
Reserves and Surplus	20	Current Assets	150
15% Debentures	200		
Current Liabilities	80		
	400		400

The additional information given is as under:

Fixed Costs per annum (excluding interest)	₹ 80 crores
Variable operating costs ratio	65%
Total Assets turnover ratio	2.5
Income-tax rate	40%

Required:

CALCULATE the following and comment:

(i) Earnings per share
(ii) Operating Leverage
(iii) Financial Leverage
(iv) Combined Leverage.

Ans.

Total Assets	= ₹ 400 crores
Asset Turnover Ratio	= 2.5
Hence, Total Sales = 400 x 2.5	= ₹ 1,000 crores

Computation of Profits after Tax (PAT)

	(₹ in crore)
Sales	1,000
Less: Variable operating cost (65% of ₹1,000 crore)	(650)
Contribution	350
Less: Fixed cost (other than Interest)	(80)
EBIT	270
Less: Interest on debentures (15% of ₹200 crore)	(30)
EBT	240
Less: Tax 40%	(96)

EAT (earnings available to equity share holders)	144

(i) Earnings per share (EPS)

$$EPS = \frac{144 \text{ crores}}{10 \text{ crore equity shares}} = ₹ 14.40$$

(ii) Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{EBIT} = \frac{350}{270} = 1.296$$

It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{EBIT}{EBT} = \frac{270}{240} = 1.125$$

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

(iv) Combined Leverage

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

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

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.

Q.22 ROI / EPS / OL / FL / CL | RTP Nov 18

A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000. You are required to INTERPRET:

(i) The firm's ROI?
(ii) Does it have favourable financial leverage?
(iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?
(iv) The operating, financial and combined leverages of the firm?
(v) If the sales is increased by 10% by what percentage EBIT will increase?
(vi) At what level of sales the EBT of the firm will be equal to zero?
(vii) If EBIT increases by 20%, by what percentage EBT will increase?

Ans. **Income Statement**

Particulars	Amount (₹)
Sales	75,00,000
Less: Variable cost (56% of 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 ₹ 45 lakhs)	(4,05,000)
Earnings before tax (EBT)	22,95,000

(i) $ROI = \frac{EBIT}{\text{Capital employed}} \times 100 = \frac{EBIT}{\text{Equity} + \text{Debt}} \times 100$

$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100 = 27\%$

(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 = $\frac{\text{Net Sales}}{\text{Capital}}$

Or $= \frac{\text{Net Sales}}{\text{Capital}} = \frac{75,00,000}{1,00,00,000} = 0.75$

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 (approx)**

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

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

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 = ₹ 75,00,000 × (1-0.6944)
= ₹ 75,00,000 × 0.3056
= ₹ 22,92,000 (approx)

Hence at ₹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)

Q.23 OL / FL / CL | RTP May 18

CALCULATE the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B:

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹30 per unit
Variable Cost	₹15 per unit

Fixed Cost:

Under Situation I	₹ 15,000
Under Situation-II	₹ 20,000

Capital Structure:

	Financial Plan	
	A (₹)	B (₹)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	20,000	20,000

Ans. **(i) Operating leverages:**

Particulars	Situation-I (₹)	Situation-II (₹)
Sales (S) (3,000 units @ ₹ 30/- per unit)	90,000	90,000
Less: Variable Cost (VC) @ ₹15 per unit	(45,000)	(45,000)
Contribution (C)	45,000	45,000
Less: Fixed Cost (FC)	15,000	20,000
EBIT	30,000	25,000
Operating Leverage $\left(\frac{C}{EBIT}\right)$	45,000 / 30,000	45,000 / 25,000
	= 1.5	= 1.8

(ii) Financial Leverages:

	A (₹)	B (₹)
Situation I:		
EBIT	30,000	30,000
Less: Interest on debt	(2,000)	(1,000)
EBT	28,000	29,000
Financial Leverage $\left(\frac{EBIT}{EBT}\right)$	30,000 / 28,000	30,000 / 29,000
	= 1.07	= 1.03
Situation-II:		
EBIT	25,000	25,000
Less: Interest on debt	(2,000)	(1,000)
EBT	23,000	24,000
Financial Leverage $\left(\frac{EBIT}{EBT}\right)$	25,000 / 23,000	25,000 / 24,000
	= 1.09	= 1.04

(iii) Combined Leverages:

	A (₹)	B (₹)
(a) Situation I	1.5 × 1.07 = 1.61	1.5 × 1.03 = 1.55
(b) Situation II	1.8 × 1.09 = 1.96	1.8 × 1.04 = 1.87

Q.24 EPS / OL / FL | MTP Nov 23 (2)

The capital structure of AB Ltd. for the year ended 31st March, 2023 consisted as follows:

Particulars	Amount in ₹
Equity share capital (face value ₹ 100 each)	20,00,000
10% debentures (₹ 100 each)	10,00,000

During the year 2022-23, sales decreased to 2,00,000 units as compared to 2,20,000 units in the previous year. However, the selling price stood at ₹ 10 per unit and variable cost at ₹ 6 per unit for both the years. The fixed expenses were at ₹ 4,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(i) The degree of financial leverage at 2,20,000 units and 2,00,000 units.

(ii) The degree of operating leverage at 2,20,000 units and 2,00,000 units.

(iii) The percentage change in EPS.

Ans. **Income Statement with required calculations**

Particulars	(₹)	(₹)
Sales in units	2,20,000	2,00,000
Sales Value	22,00,000	20,00,000
Variable Cost	(13,20,000)	(12,00,000)
Contribution	8,80,000	8,00,000
Fixed expenses	(4,00,000)	(4,00,000)
EBIT	4,80,000	4,00,000
Debenture Interest	(1,00,000)	(1,00,000)
EBT	3,80,000	3,00,000
Tax @ 30%	(1,14,000)	(90,000)
Profit after tax (PAT)	2,66,000	2,10,000
No. of shares	20,000	20,000
(i) Financial Leverage $\frac{EBIT}{EBT}$	$= \frac{4,80,000}{3,80,000}$ = 1.26	$= \frac{4,00,000}{3,00,000}$ = 1.33
(i) Operating Leverage $\frac{Contribution}{EBIT}$	$= \frac{8,80,000}{4,80,000}$ = 1.83	$= \frac{8,00,000}{4,00,000}$ = 2
(iii) Earnings per share (EPS) $\frac{PAT}{No.\ of\ shares}$	$= \frac{2,66,000}{20,000}$ = ₹ 13.3	$= \frac{2,10,000}{20,000}$ = ₹ 10.5
Decrease in EPS	= ₹ 13.3 – ₹ 10.5 = ₹ 2.8	
% decrease in EPS	$= \frac{2.8}{13.3} \times 100$ = 21.05%	

Q.25 EBIT / Sales / Fixed Cost | MTP Nov 23 (1)

Following are the selected financial information of A Ltd. and B Ltd. for the current Financial Year:

	A Ltd.	B Ltd.
Variable Cost Ratio	60%	50%
Interest	₹ 30,000	₹ 1,20,000
Operating Leverage	6	3
Financial Leverage	4	3
Tax Rate	30%	30%

You are required to FIND out:

(i) EBIT

(ii) Sales

(iii) Fixed Cost

(iv) Identify the company which is better placed with reasons based on leverages.

Ans. **Company A**

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

So, $4 = \frac{\text{EBIT}}{\text{EBIT} - ₹\ 30,000}$

Or, $4\ (\text{EBIT} - 30,000) = \text{EBIT}$

Or, $3\ \text{EBIT} = 1,20,000$

Or, $\text{EBIT} = 40,000$

(ii) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$ Or, $6 = \frac{\text{Contribution}}{40,000}$

Or Contribution = ₹ 2, 40,000

Sales $= \frac{\text{Contribution}}{\text{P / V Ratio}\ (1 - \text{variable cost ratio})} = \frac{2,40,000}{40\%}$ = ₹ 6,00,000

(iii) Fixed Cost = Contribution – EBIT
= ₹ 2, 40,000 – 40,000

Or Fixed cost = ₹ 2,00,000

Company B

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

So, $3 = \frac{\text{EBIT}}{\text{EBIT} - 1,20,000}$

Or, 3 (EBIT – ₹1,20,000) = EBIT
Or, 3 EBIT -₹ 3,60,000 = EBIT
Or, 2 EBIT = ₹ 3,60,000
Or, EBIT = ₹ 1,80,000

(ii) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

Or, $3 = \frac{\text{Contribution}}{1,80,000}$

Or, Contribution = ₹ 5,40,000

Sales $= \frac{\text{Contribution}}{\text{P / V Ratio}\ (1 - \text{variable cost ratio})} = \frac{5,40,000}{50\%}$ = ₹ 10,80,000

(iii) Fixed Cost = Contribution – EBIT
= ₹ 5,40,000 – ₹ 1,80,000

Or, Fixed cost = ₹ 3,60,000

Income Statements of Company A and Company B

	Company A (₹)	Company B (₹)
Sales	6,00,000	10,80,000
Less: Variable cost	3,60,000	5,40,000
Contribution	2,40,000	5,40,000
Less: Fixed Cost	2,00,000	3,60,000
Earnings before interest and tax (EBIT)	40,000	1,80,000

Less: Interest	30,000	1,20,000
Earnings before tax (EBT)	10,000	60,000
Less: Tax @ 30%	3,000	18,000
Earnings after tax (EAT)	7,000	42,000

Comment based on Leverage

Comment based on leverage – Company B is better than company A of the following reasons:

- Capacity of Company B to meet interest liability is better than that of companies A (from EBIT/ Interest ratio)

  [A = $\frac{40,000}{30,000}$ = 1.33, B = $\frac{1,80,\ 000}{1,20,000}$ = 1.50]

  Company B has the least financial risk as the total risk (business and financial) of company B is lower (combined leverage of Company A – 24 and Company B- 9)

Q.26 PL Statement | MTP May 23 (2)

Manchow Limited and Noodles Limited are generating same level of Operating Income. The margin of safety for Manchow Ltd is 0.4 and for Noodles Limited it is 1.25 times of Manchow Ltd. The Interest expense of Manchow Limited is ₹ 22,50,000 and it is 40% lower for Noodles Limited. Financial Leverages of Manchow Limited and Noodles Limited are 3 and 2 respectively. Profit Volume Ratio for both companies stand as 40% and 50% respectively. Assuming a tax rate of 30%,

REPARE income statement for both companies

Ans.

Particulars	Manchow Ltd (₹)	Noodle Ltd (₹)
Sales	2,10,93,750	1,08,00,000
Less: Variable Cost	1,26,56,250	54,00,000
Contribution	84,37,500	54,00,000
Less: Fixed Cost	50,62,500	27,00,000
EBIT	33,75,000	27,00,000
Less: Interest	22,50,000	13,50,000
EBT	11,25,000	13,50,000
Less: Tax	3,37,500	4,05,000
PAT	7,87,500	9,45,000

Workings:

(i) Margin of Safety

For Manchow Ltd= 0.4

For Noodles Ltd= 0.4 x 1.25 = 0.5

(ii) Interest Expense

For Manchow Ltd = ₹ 22,50,000

For Noodles Ltd = ₹ 22,50,000 x 60%= ₹ 13,50,000

(iii) For Manchow Ltd:

Financial Leverage = 3

$$\frac{EBIT}{EBT} = \frac{EBIT}{EBIT - Interest} = 3$$

$$\frac{EBIT}{EBIT - 22,50,000} = 3$$

EBIT = 3 EBIT- 67,50,000

67,50,000 = 2 EBIT

EBIT = 33,75,000

For Noodles Ltd:

Financial Leverage = 2

$$\frac{EBIT}{EBT} = \frac{EBIT}{EBIT - Interest} = 2$$

$$\frac{EBIT}{EBIT - 13,50,000} = 2$$

EBIT = 2 EBIT-27,00,000

EBIT =27,00,000

(iv) Contribution:

For Manchow Ltd

Operating Leverage = 1/ Margin of Safety

= 1/0.4

= 2.5

Operating Leverage = Contribution/EBIT

2.5 = Contribution/33,75,000

Contribution = 84,37,500

For Noodles Ltd

Operating Leverage = 1/ Margin of Safety

= 1/0.5

= 2

Operating Leverage = Contribution/EBIT

2 = Contribution/27,00,000

Contribution = 54,00,000

(v) Sales:

For Manchow Ltd

P/V Ratio	= 40%
P/V Ratio	= Contribution/Sales
0.4	= 84,37,500/Sales
Sales	= 2,10,93,750

For Noodles Ltd

P/V Ratio	= 50%
P/V Ratio	= Contribution/Sales
0.5	= 54,00,000/Sales
Sales	= 1,08,00,000

Q.27 PL Statement | MTP May 23 (1)

Following are the selected financial Information of Alt Car Limited for the year ended 31st March 2022:

Financial Leverage	3
Interest	₹ 85,000
Operating Leverage	2
Variable cost as a percentage of sales	85%
Income tax rate	25%

You are required to PREPARE the Income Statement.

Ans.

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

Or, $3 = \frac{EBIT}{EBIT - Interest}$

Or, $3 = \frac{EBIT}{EBIT - ₹\ 85000}$

Or, EBIT = ₹1,27,500

(ii) Operating Leverage $= \frac{Contribution}{EBIT}$

Or, $= \frac{Contribution}{1,27,500} = 2$

Or, Contribution = ₹ 2,55,000

(iii) Sales $= \frac{Contribution}{P\ /\ V\ Ratio} = \frac{2,55,\ 000}{15\%}$ = ₹17,00,000

(iv) Now, Contribution – Fixed cost = EBIT

Or ₹ 2,55,000 – Fixed cost = ₹1,27,500

Or Fixed Cost =₹1,27,500

Income Statement for the year ended 31st March 2022

Particulars	₹
Sales	17,00,000
Less: Variable Cost (85% of Rs.17,00,000)	(14,45,000)
Contribution	2,55,000
Less: Fixed Cost (Contribution - EBIT)	(1,27,500)
Earnings Before Interest and Tax (EBIT)	1,27,500
Less: Interest	(85,000)
Earnings Before Tax (EBT)	42,500
Less: Income Tax @ 25%	(10,625)
Earnings After Tax (EAT or PAT)	31,875

Q.28 EPS / OL / FL | MTP Nov 22 (2)

(a) The following information is related to Navya Company Ltd. for the year ended 31st March 2022:

Equity share capital (₹ 10 each)	₹ 65,50,000
12% Bonds of ₹ 1,00 each	₹ 60,91,400
Sales	₹ 111 lakhs
Fixed cost (excluding interest)	₹ 7,15,000
Financial leverage	1.55
Profit-volume Ratio	25%
Income Tax Applicable	30%

You are required to CALCULATE:

(i) Operating Leverage.

(ii) Combined leverage; and

(iii) Earnings per share.

Show calculations upto two decimal points.

(b) Write a short note on seed capital assistance.

Ans. **(a)**

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

(ii) Combined Leverage:

= Operating Leverage × Financial Leverage

= 1.35 × 1.55 = 2.09 (Approx)

Or,

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

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

(iii) Earnings per share (EPS):

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

(b) Seed Capital Assistance: The seed capital assistance has been designed by IDBI for professionally or technically qualified entrepreneurs. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme. The project cost should not exceed ₹2 crores and the maximum assistance under the project will be restricted to 50% of the required promoter's contribution or ₹ 15 lacs whichever is lower.

The seed capital assistance is interest free but carries a security charge of one percent per annum for the first five years and an increasing rate thereafter

Q.29 OL / Break Even | MTP Nov 22 (1)

Following information is provided relating to SVB Ltd.:

Sales price	₹ 21 per unit
Variable cost	₹ 13.50 per unit
Break-even point	30,000 units

You are required to CALCULATE operating leverage at sales volume 37,500 units and 45,000 units.

Ans.

Computation of Operating Leverage (OL)

Selling Price = ₹ 21 per unit

Variable Cost = ₹ 13.50 per unit

Fixed Cost = BEP × (Selling price – Variable cost) = 30,000 × (21 – 13.50) = 30,000 × 7.5 = 2,25,000

Particulars	For 37,500 units (₹)	For 45,000 units (₹)
Sales (@ ₹ 21 /unit)	7,87,500	9,45,000
Less: Variable Cost (@ 13.50 /unit)	5,06,250	6,07,500
Contribution	2,81,250	3,37,500
Less: Fixed Cost	2,25,000	2,25,000
Earnings before Interest and tax (EBIT)	56,250	1,12,500
Operating Leverage $\left(\frac{\text{Contribution}}{\text{EBIT}}\right)$	$\left(\frac{2,81,250}{56,250}\right)$	$\left(\frac{2,81,250}{1,12,500}\right)$
Operating Leverage	5 times	3 times

Q.30 PL Statement | MTP May 22 (2)

From the given details, PREPARE Income Statement for Alpha Ltd. and Beta Ltd.

Particulars	Alpha Ltd.	Beta Ltd.
Operating Leverage	1.875	1.800
Financial Leverage	1.600	1.250
PV Ratio	60%	50%
Profit after tax	₹ 3,00,000	₹ 2,40,000
Tax rate	40%	40%

Ans.

Particulars	Alpha Ltd. (₹)	Beta Ltd. (₹)	
Sales	25,00,000	18,00,000	
Less: Variable Cost	10,00,000	9,00,000	(Bal. fig.)
Contribution	15,00,000	9,00,000	
Less: Fixed Cost	7,00,000	4,00,000	(Bal. fig.)
EBIT	8,00,000	5,00,000	

Less: Interest	3,00,000	1,00,000	(Bal. fig.)
PBT	5,00,000	4,00,000	
Less: Tax (40%)	2,00,000	1,60,000	
PAT	3,00,000	2,40,000	

Working Note:

Particulars	Alpha Ltd.	Beta Ltd.
PAT	₹ 3,00,000	₹ 2,40,000
Tax Rate (t)	40%	40%
PBT = PAT/(I-t)	$\frac{3,00,000}{1-0.4}$ = 5,00,000	$\frac{2,40,000}{1-0.4}$ = 4,00,000
Finance Leverage	1.60	1.25
EBIT = PBT × FL	5,00,000 × 1.6 = 8,00,000	4,00,000 × 1.25 = 5,00,000
Operating Leverage	1.875	1.800
Contribution = EBIT × OL	8,00,000 × 1.875 = 15,00,000	5,00,000 × 1.8 = 9,00,000
PV ratio	60%	50%
Sales = $\frac{\text{Contribution}}{\text{PV ratio}}$	$\frac{15,00,000}{.60}$ = 25,00,000	$\frac{9,00,000}{.50}$ = 18,00,000

Q.31 EPS / OL / FL | MTP May 22 (1)

The capital structure of Roshan Ltd. for the year ended 31st March, 2022 consisted as follows:

Particulars	Amount (₹' 000)
Equity share capital (face value ₹ 100 each)	1,50,000
10% debentures (₹ 100 each)	1,50,000

During the year 2021-22, sales of the company decreased to 15,00,000 units as compared to 18,00,000 units in the previous year. However, the selling price stood at ₹ 120 per unit and variable cost at ₹ 80 per unit for both the years. The fixed expenses were at ₹ 3 crore p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(i) The degree of financial leverage at 18,00,000 units and 15,00,000 units.

(ii) The degree of operating leverage at 18,00,000 units and 15,00,000 units.

(iii) The percentage change in EPS.

Ans. **Income Statement with required calculations**

Particulars	Previous Year	Current Year
Sales (in units)	18,00,000	15,00,000
No. of shares	15,00,000	15,00,000
	(₹' 000)	**(₹' 000)**
Sales Value	2,16,000	1,80,000
Variable Cost	(1,44,000)	(1,20,000)
Contribution	72,000	60,000

Fixed expenses	(30,000)	(30,000)
EBIT	42,000	30,000
Debenture Interest	(15,000)	(15,000)
EBT	27,000	15,000
Tax @ 30%	(8,100)	(4,500)
Profit after tax (PAT)	18,900	10,500
(i) Financial Leverage = EBIT / EBT	= ₹ 42,000 / ₹ 27,000 = 1.56	= ₹ 30,000 / ₹ 15,000 = 2
(ii) Operating leverage = Contribution / EBIT	= ₹ 72,000 / ₹ 42,000 = 1.71	= ₹ 60,000 / ₹ 30,000 = 2
(iii) Earnings per share (EPS) = PAT / No. of shares	= ₹ 18,900 / ₹ 1,500 = ₹ 12.6	= ₹ 10,500 / ₹ 1,500 = ₹ 7
Decrease in EPS	= ₹ 12.6 – ₹ 7 = ₹ 5.6 % decrease in EPS = 5.6 / 12.6 x 100 = 44.44%	

Q.32 EPS / OL / FL | MTP Dec 21 (2)

The capital structure of PS Ltd. for the year ended 31st March, 2021 consisted as follows:

Particulars	Amount in ₹
Equity share capital (face value ₹ 10 each)	10,000
10% debentures (₹ 100 each)	1,00,000

During the year 2020-21, sales decreased to 10,000 units as compared to 12,000 units in the previous year. However, the selling price stood at ₹ 12 per unit and variable cost at ₹ 8 per unit for both the years. The fixed expenses were at ₹ 20,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(i) The degree of financial leverage at 12,000 units and 10,000 units.

(ii) The degree of operating leverage at 12,000 units and 10,000 units.

(iii) The percentage change in EPS due to change in units sold.

Ans.

Sales in units	12,000 (₹)	10,000 (₹)
Sales Value	1,44,000	1,20,000
Variable Cost	(96,000)	(80,000)
Contribution	48,000	40,000
Fixed expenses	(20,000)	(20,000)

EBIT	28,000	20,000
Debenture Interest	(10,000)	(10,000)
EBT	18,000	10,000
Tax @ 30%	(5,400)	(3,000)
Profit after tax (PAT)	12,600	7,000
(i) Financial Leverage= $\frac{EBIT}{EBT}$	$= \frac{28,000}{18,000} = 1.56$ ₹	$= \frac{20,000}{10,000} = 2$
(ii) Operating leverage = $\frac{Contribution}{EBIT}$	$= \frac{48,000}{28,000} = 1.71$ ₹	$= \frac{40,000}{20,000} = 2$ ₹
(iii) Earnings per share (EPS)	$= \frac{12,600}{1,000} = 12.6$	$= \frac{7,000}{1,000} = ₹ 7$
Decrease in EPS	= ₹ 12.6 - ₹ 7 = ₹ 5.6	
% decrease in EPS	$= \frac{5.6}{12.6} \times 100 = 44.44\%$	

Q.33 FL / PV / EPS | MTP Dec 21 (1)

(a) The following details of PQR Limited for the year ended 31st March, 2021 are given below:

Operating leverage	1.4
Combined leverage	2.8
Fixed Cost (Excluding interest)	₹ 2.10 lakhs
Sales	₹ 40.00 lakhs
10% Debentures of ₹ 100 each	₹ 25.00 lakhs
Equity Share Capital of ₹ 10 each	₹ 20.00 lakhs
Income tax rate	30 per cent

REQUIRED:

(i) Calculate Financial leverage

(ii) Calculate P/V ratio and Earning per Share (EPS)

(iii) If the company belongs to an industry, whose assets turnover is 1.6, does it have a high or low assets turnover?

(iv) At what level of sales, the Earning before Tax (EBT) of the company will be equal to zero? In the question, assume that 10% Debentures and Share Capital consists of total liabilities.

(b) Write a short note on electronic fund transfer.

Ans. **(a) (i) Financial leverage**

Combined Leverage = Operating Leverage x Financial Leverage

So, financial leverage = Combined Leverage/Operating Leverage

= 2.8/1.4 = 2

(ii) P/V Ratio and EPS

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Contribution} - \text{Fixed Cost}}$$

$$1.4 = \frac{\text{Contribution}}{\text{Contribution} - 2,10,000}$$

1.4 Contribution – 2,94,000 = Contribution
0.4 Contribution = 2,94,000
Contribution = 7,35,000

$$\text{Now, P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{7,35,000}{40,00,000} \times 100 = 18.375\%$$

$$\text{EPS} = \frac{\text{Profitafter tax (PAT)}}{\text{No. of equity shares}}$$

Earning before tax (EBT) = Contribution – Fixed Cost – Interest
= 7,35,000 – 2,10,000 – 2,50,000
= 2,75,000

Profit after tax = EBT – Tax @ 30%
= 2,75,000 – 82,500
= 1,92,500

$$\text{EPS} = \frac{1,92,500}{2,00,000} = 0.9625$$

(iii) Asset Turnover

Total Assets = Equity Share Capital + Debentures = ₹ 20 lakhs + ₹ 25 lakhs = ₹ 45 lakhs

$$\text{Asset Turnover} = \frac{\text{Sales}}{\text{TotalAssets}} = \frac{40,00,000}{45,00,000} = 0.89$$

0.89 < 1.6, means lower than industry turnover.

(iv) EBT zero means 100% reduction in EBT. Since combined leverage is 2.8, sales have to be dropped by 100/2.8 = 35.71%. Hence new sales will be
40,00,000 x (100% - 35.71%) = 25,71,600

(b) Electronic Fund Transfer: With the developments which took place in the information technology, the present banking system has switched over to the computerization of banks branches to offer efficient banking services and cash management services to their customers. The network wil l be linked to the different branches, banks. This helped the customers in the following ways:
(i) Instant updating of accounts.
(ii) Quick transfer of funds.
(iii) Instant information about foreign exchange rates.

Q.34 OL / FL | MTP May 21 (2)

Following data of MT Ltd. under Situations 1, 2 and 3 and Financial Plan A and B is given: Installed Capacity (units) 3,600

Actual Production and Sales (units)		2,400
Selling price per unit (Rs.)		30
Variable cost per unit (Rs.)		20
Fixed Costs (Rs.):	Situation 1	3,000
	Situation 2	6,000
	Situation 3	9,000

Capital Structure :

Particulars	Financial Plan	
	A	B
Equity	Rs. 15,000	Rs. 22,500
Debt	Rs. 15,000	Rs. 7,500
Cost of Debt	12%	12%

Required:

(i) CALCULATE the operating leverage and financial leverage.

(ii) FIND out the combinations of operating and financial leverage which give the highest value and the least value.

Ans. **(i)** **Operating Leverage**

	Situation 1 (Rs.)	Situation 2 (Rs.)	Situation 3 (Rs.)
Sales (S)			
2,400 units @ Rs. 30 per unit	72,000	72,000	72,000
Less: Variable Cost (VC) @ Rs. 20 per unit	48,000	48,000	48,000
Contribution (C)	24,000	24,000	24,000
Less: Fixed Cost (FC)	3,000	6,000	9,000
EBIT	21,000	18,000	15,000
Operating Leverage = $\frac{C}{EBIT}$	Rs. 24,000 / Rs. 21,000 = 1.14	Rs. 24,000 / Rs. 18,000 = 1.33	Rs. 24,000 / Rs. 15,000 = 1.60

Financial Leverage

	Financial Plan	
	A (Rs.)	B (Rs.)
Situation 1		
EBIT	21,000	21,000
Less: Interest on debt (Rs. 15,000 x 12%);(Rs. 7,500 x 12%)	1,800	900
EBT	19,200	20,100
Financial Leverage = $\frac{EBIT}{EBT}$	Rs. 21,000 / Rs. 19,200 = 1.09	Rs. 21,000 / Rs. 20,100 = 1.04
Situation 2		
EBIT	18,000	18,000
Less: Interest on debt	1,800	900
EBT	16,200	17,100
Financial Leverage = $\frac{EBIT}{EBT}$	Rs. 18,000 / Rs. 16,200 = 1.11	Rs. 18,000 / Rs. 17,100 = 1.05
Situation 3		
EBIT	15,000	15,000
Less: Interest on debt	1,800	900
EBT	13,200	14,100

Financial Leverage = $\frac{EBIT}{EBT}$	$\frac{Rs.\ 15,000}{Rs.\ 13,200}$ = 1.14	$\frac{Rs.\ 15,000}{Rs.\ 14,100}$ = 1.06

(ii) Combined Leverages

CL = OL x FL

	Financial Plan	
	A (Rs.)	B (Rs.)
(a) Situation 1	1.14 x 1.09 = 1.24	1.14 x 1.04 = 1.19
(b) Situation 2	1.33 x 1.11 = 1.48	1.33 x 1.05 = 1.40
(c) Situation 3	1.60 x 1.14 = 1.82	1.60 x 1.06 = 1.70

The above calculations suggest that the highest value is in Situation 3 financed by Financial Plan A and the lowest value is in the Situation 1 financed by Financial Plan B.

Q.35 OL / CL | MTP May 21 (1)

Following information are related to four firms of the same industry:

Firm	Change in Revenue	Change in Operating Income	Change in Earning per Share
P	25%	23%	30%
Q	27%	30%	26%
R	24%	36%	20%
S	20%	30%	20%

For all the firms, FIND OUT:

(i) Degree of operating leverage, and

(ii) Degree of combined leverage.

Ans. **Calculation of Degree of Operating leverage and Degree of Combined leverage**

Firm	Degree of Operating Leverage (DOL) = $\frac{\%\text{ change in Operating Income}}{\%\text{ change in Revenue}}$	Degree of Combined Leverage (DCL) = $\frac{\%\text{ change in EPS}}{\%\text{ change in Revenue}}$
P	$\frac{23\%}{25\%}$ = 0.92	$\frac{30\%}{25\%}$ = 1.2
Q	$\frac{30\%}{27\%}$ = 1.11	$\frac{26\%}{27\%}$ = 0.96
R	$\frac{36\%}{24\%}$ = 1.50	$\frac{20\%}{24\%}$ = 0.83
S	$\frac{30\%}{20\%}$ = 1.50	$\frac{20\%}{20\%}$ = 1.00

Q.36 OL / FL / CL | MTP May 20

The data relating to two companies are as given below:

	Company A	Company B
Equity Capital	Rs.6,00,00,000	Rs.3,50,00,000

15% Debentures	Rs.40,00,000	Rs.65,00,000
Output (units) per annum	6,00,000	1,50,000
Selling price/ unit	Rs.60	Rs.500
Fixed Costs per annum	Rs.70,00,000	Rs.1,40,00,000
Variable Cost per unit	Rs.30	Rs.275

You are required to CALCULATE the Operating leverage, Financial leverage and Combined leverage of the two Companies.

Ans. **Computation of Operating leverage, Financial leverage and Combined leverage of two companies**

	Company A	Company B
Output units per annum	6,00,000	1,50,000
	(Rs.)	**(Rs.)**
Selling price / unit	60	500
Sales revenue	3,60,00,000 (6,00,000 units ÷ Rs.60)	7,50,00,000 (1,50,000 units ÷ Rs.500)
Less: Variable costs	1,80,00,000 (6,00,000 units ÷ Rs.30)	4,12,50,000 (1,50,000 units ÷ Rs.275)
Contribution (C)	1,80,00,000	3,37,50,000
Less: Fixed costs	70,00,000	1,40,00,000
EBIT (Earnings before Interest and tax)	1,10,00,000	1,97,50,000
Less: Interest @ 15% on debentures	6,00,000	9,75,000
PBT	1,04,00,000	1,87,75,000
Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	1.64 (Rs.1,80,00,000 ÷ 1,10,00,000)	1.71 (Rs.3,37,50,000 ÷ Rs. 1,97,50,000)
Financial Leverage = $\frac{\text{EBIT}}{\text{PBT}}$	1.06 (Rs.1,10,00,000 ÷ Rs.1,04,00,000)	1.05 (Rs.1,97,50,000 ÷ Rs. 1,87,75,000)
Combined Leverage = DOL x DFL	1.74 (1.64 x 1.06)	1.80 (1.71 x 1.05)

Q.37 OL / FL / CL | MTP Nov 19

B LLP. has the following balance sheet and Income statement information:

Balance Sheet as on March 31st 2019

Liabilities	(Rs.)	Assets	(Rs.)
Partners' Capital	80,00,000	Net Fixed Assets	1,00,00,000
Term Loan	60,00,000	Inventories	45,00,000
Retained Earnings	35,00,000	Trade Receivables	40,50,000
Trade Payables	15,00,000	Cash & Bank	4,50,000
	1,90,00,000		1,90,00,000

Income Statement for the year ending March 31st 2019

	(Rs.)
Sales	34,00,000
Operating expenses (including Rs. 6,00,000 depreciation)	12,00,000
EBIT	22,00,000
Less: Interest	6,00,000
Earnings before tax	16,00,000
Less: Taxes	5,60,000
Net Earnings (EAT)	10,40,000

COMPUTE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.

Ans. **Computation of Degree of Operating (DOL), Financial (DFL) and Combined leverages (DCL).**

$$DOL = \frac{Rs.34,00,000 - Rs.6,00,000}{Rs.22,00,000} = 1.27$$

$$DFL = \frac{Rs.22,00,000}{Rs.16,00,000} = 1.38$$

DCL = DOL x DFL = 1.27 x 1.38 = 1.75

Q.38 PL Statement | MTP May 19 (1)

From the following details of X Ltd., PREPARE the Income Statement for the year ended 31st March, 20X8:

Financial Leverage	2
Interest	Rs. 5,000
Operating Leverage	3
Variable cost as a percentage of sales	75%
Income tax rate	30%

Ans. **Workings:**

(i) $Financial\ Leverage = \frac{EBIT}{EBIT - Interest}$ Or, $2 = \frac{EBIT}{EBIT - Rs.5,000}$

Or, EBIT = Rs.10,000

(ii) $Operating\ Leverage = \frac{Contribution}{EBIT}$

Or, $3 = \frac{Contribution}{Rs.10,000}$

Or, Contribution = Rs.30,000

(iii) $Sales = \frac{Contribution}{P/V\ Ratio} = \frac{Rs.30,000}{25\%} = Rs.1,20,000$

(iv) Fixed Cost = Contribution – Fixed cost = EBIT

= Rs.30,000 – Fixed cost = Rs.10,000

Or, Fixed cost = Rs. 20,000

Income Statement for the year ended 31st March, 20X8

Particulars	Amount (Rs.)
Sales	1,20,000
Less: Variable Cost (75% of Rs.1,20,000)	(90,000)
Contribution	30,000
Less: Fixed Cost (Contribution - EBIT)	(20,000)
Earnings Before Interest and Tax (EBIT)	10,000
Less: Interest	(5,000)
Earnings Before Tax (EBT)	5,000
Less: Income Tax @ 30%	(1,500)
Earnings After Tax (EAT or PAT)	3,500

Q.39 EPS / OL / FL | MTP May 19 (2)

The capital structure of Anshu Ltd. as at 31.3.2019 consisted of ordinary share capital of Rs. 5,00,000 (face value Rs. 100 each) and 10% debentures of Rs. 5,00,000 (Rs. 100 each). In the year ended with March 2019, sales decreased from 60,000 units to 50,000 units. During this year and in the previous year, the selling price was Rs. 12 per unit; variable cost stood at Rs. 8 per unit and fixed expenses were at Rs. 1,00,000 p.a. The income tax rate was 30%.

You are required to CALCULATE the following:

(i) The percentage of decrease in earnings per share.

(ii) The degree of operating leverage at 60,000 units and 50,000 units.

(iii) The degree of financial leverage at 60,000 units and 50,000 units.

Ans. **Therefore Inventory = Rs. 1,60,000/4 = Rs. 40,000**

Sales in units	60,000 Rs.	50,000 Rs.
Sales Value	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) Earning per share (EPS) = $\frac{63,000}{5,000}$ = Rs. 12.6 $\frac{35,000}{5,000}$ = Rs. 7

Decrease in EPS = 12.6 – 7 = 5.6

% decrease in EPS = $\frac{5.6}{12.6} \times 100 = 44.44\%$

(ii) Operating leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{2,40,000}{1,40,000}$ $\frac{2,00,000}{1,00,000}$

= 1.71 2

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

= 1.56 2

Q.40 PL Statement | MTP Nov 18 (2)

From the following, PREPARE Income Statement of Company A and B.

Company	A	B
Financial leverage	3:1	4:1
Interest	Rs.20,000	Rs.30,000
Operating leverage	4:1	5:1
Variable Cost as a Percentage to Sales	$66\frac{2}{3}\%$	75%
Income tax Rate	45%	45%

Ans.

Working Notes:

Company A

Financial leverage = $\frac{EBIT}{EBT} = \frac{3}{1}$ = Or, EBIT = 3× EBT (1)

Again EBIT – Interest = EBT

Or, EBIT- 20,000 = EBT (2)

Taking (1) and (2) we get

3 EBT- 20,000 = EBT

Or, 2 EBT = 20,000 or EBT = Rs.10,000

Hence EBIT = 3EBT = Rs.30,000

Again, we have operating leverage = $\frac{Contribution}{EBIT} = \frac{4}{1}$

EBIT = Rs. 30,000, hence we get

Contribution = 4 × EBIT = Rs.1,20,000

Now variable cost = $66\frac{2}{3}$ % on sales

Contribution = 100 - $66\frac{2}{3}$ % i.e. $33\frac{1}{3}$ % on sales

Hence, sales = $\frac{1,20,000}{33\frac{1}{3}\%}$ = Rs. 3,60,000

Same way EBIT, EBT, contribution and sales for company B can be worked out.

Company B

Financial leverage = $\frac{EBIT}{EBT} = \frac{4}{1}$ or EBIT = 4 EBT (3)

Again EBIT – Interest = EBT or EBIT – 30,000 = EBT (4)

Taking (3) and (4) we get, 4EBT- 30,000 = EBT

Or, 3EBT = 30,000 Or, EBT=10,000

Hence, EBIT = 4 × EBT= 40,000

Again, we have operating leverage = $\frac{Contribution}{EBIT} = \frac{5}{1}$

EBIT= 40,000; Hence we get contribution = 5 × EBIT = 2,00,000
Now variable cost =75% on sales
Contribution = 100- 75% i.e. 25% on sales

Hence Sales = $\frac{2,00,000}{25\%}$ = Rs. 8,00,000

Income Statement

	A (Rs.)	B (Rs.)
Sales	3,60,000	8,00,000
Less: Variable Cost	2,40,000	6,00,000
Contribution	1,20,000	2,00,000
Less: Fixed Cost (bal. Fig)	90,000	1,60,000
EBIT	30,000	40,000
Less: Interest	20,000	30,000
EBT	10,000	10,000
Less: Tax 45%	4,500	4,500
EAT	5,500	5,500

Q.41 ROCE / EPS / OL / FL / CL | MTP Nov 18 (1)

NSG Ltd. has a sale of Rs.75,00,000, variable cost of Rs.42,00,000 and fixed cost of Rs.6,00,000.

The Present capital structure of NSG is as follows:

Equity Shares	Rs. 55,00,000
Debt (12%)	Rs. 45,00,000
Total	Rs. 1,00,00,000

(i) DETERMINE the ROCE of NSG Ltd.

(ii) Does NSG have a favourable financial leverage? ANALYSE.

(iii) If the industry average of asset turnover is 3, does it have a high or low asset leverage? DETERMINE

(iv) COMPUTE the leverages of NSG?

(v) DETERMINE, at what level of sales, will the EBT be zero?

Ans. (i) ROCE = $\frac{\text{EBIT}}{\text{Captial employed}} = \frac{\text{Rs. } 27,00,000}{\text{Rs.}1,00,00,000} \times 100 = 27\%$

Workings:

(I) Calculation of EBT:	Rs.
Sales	75,00,000
Less: Variable costs	42,00,000
Contribution	33,00,000
Less: Fixed costs	6,00,000
EBIT	27,00,000
Less: Interest (12 % of Rs. 45,00,000)	5,40,000
EBT	21,60,000

Capital employed = Debt + Equity Shares = Rs. 1,00,00,000.

(ii) Since ROCE (27%) is higher than the interest payable on debt (12%). NSG has a favourable financial leverage.

(iii) Capital employed = Total assets = Rs. 1,00,00,000
Net sales = Rs.75,00,000

Therefore, turnover ratio $= \frac{\text{Rs. } 75,00,000}{\text{Rs. } 1,00,00,000} = 0.75$

The industry average is 3 against NSG's ratio of 0.75. Hence NSG Ltd. has very low asset leverage.

(iv) Operating leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs.}33,00,000}{\text{Rs. } 27,00,000} = 1.22$

Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Rs.}27,00,000}{\text{Rs. } 21,60,000} = 1.25$

Combined leverage $= \frac{\text{Contribution}}{\text{EBT}} = \frac{\text{Rs.}33,00,000}{\text{Rs. } 21,60,000} = 1.53$

Or
DCL = DOL × DFL = 1.22 × 1.25 = 1.53

(v) For EBT to become zero, a 100% reduction in the EBT is required. As the combined leverage is 1.53, sales have to drop approx. by 100/1.53 = 65.36%. Hence, the new sales will be:
Rs. 75,00,000 × (1 – 0.6536) = Rs. 25,98,000 (approx.)

Q.42 EPS / OL / CL | MTP May 18

The following information is related to YZ Company Ltd. for the year ended 31 st March, 20X8:

Equity share capital (of ₹ 10 each)	₹ 50 lakhs
12% Bonds of ₹ 1,000 each	₹ 37 lakhs
Sales	₹ 84 lakhs
Fixed cost (excluding interest)	₹ 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:
(i) Operating Leverage;
(ii) Combined leverage; and
(iii) Earnings per share.
(Show calculations upto two decimal points.)

Ans. **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% □ ₹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:

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{23,14,200}{16,18,200} \text{ ₹} = 1.43$$

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

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

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

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

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

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

(iii) Earnings per share (EPS):

$$= \frac{\text{PAT}}{\text{No.of shares outstanding}} = \frac{6,51,624}{5,00,000 \text{ equity shares}} = ₹1.30$$

Q.43 EBIT / OL | ICAI MAT

A Company produces and sells 10,000 shirts. The selling price per shirt is ₹ 500. Variable cost is ₹ 200 per shirt and fixed operating cost is ₹ 25,00,000.
(a) CALCULATE operating leverage.
(b) If sales are up by 10%, then COMPUTE the impact on EBIT?

Ans. **(a) Statement of Profitability**

	₹
Sales Revenue (10,000 × 500)	50,00,000
Less: Variable Cost (10,000 × 200)	20,00,000
Contribution	30,00,000
Less: Fixed Cost	25,00,000
EBIT	5,00,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{30\text{lakhs}}{5\text{ lakhs}} = 6 \text{ times}$$

(b) Operating Leverage (OL) $= \frac{\%\text{Changein EBIT}}{\%\text{Change in Sales}}$

6 = $\frac{X \ / 5,00,000}{5,00,000 / 50,00,000}$

X = ₹ 3,00,000

EBIT = ₹ 3,00,000/₹ 5,00,000 = 60%

Q.44 EBIT / OL | ICAI MAT

CALCULATE the operating leverage for each of the four firms A, B, C and D from the following price and cost data:

	Firms			
	A (₹)	*B(₹)*	*C(₹)*	*D(₹)*
Sale price per unit	*20*	*32*	*50*	*70*
Variable cost per unit	*6*	*16*	*20*	*50*
Fixed operating cost	*60,000*	*40,000*	*1,00,000*	*Nil*

What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? EXPLAIN. Assume number of units sold is 5,000.

Ans.

	Firms			
	A (₹)	B (₹)	C (₹)	D (₹)
Sales (units)	5,000	5,000	5,000	5,000
Sales revenue (Units × sale price per unit)	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

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

$$DOL_{(A)} = \frac{`1,\ 00,\ 000 - `\ 30,\ 000}{10,000} = 7$$

$$DOL_{(B)} = \frac{1,60,\ 000 - `\ 80,\ 000}{40,000} = 2$$

$$DOL_{(C)} = \frac{2,50,000 - `\ 1,\ 00,\ 000}{50,000} = 3$$

$$DOL_{(D)} = \frac{3,50,000 - `\ 2,50,\ 000}{1,00,000} = 1$$

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 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.

Q.45 ROI / EPS / OL / FL / CL | ICAI MAT

A firm's details are as under:

Sales (@100 per unit)	₹ 24,00,000
Variable Cost	50%
Fixed Cost	₹ 10,00,000

It has borrowed ₹ 10,00,000 @ 10% p.a. and its equity share capital is ₹ 10,00,000 (₹ 100 each).
Consider tax @ 50 %. CALCULATE:

(a) Operating Leverage
(b) Financial Leverage
(c) Combined Leverage
(d) Return on Investment
(e) If the sales increases by ₹ 6,00,000; what will the new EBIT?

Ans.

	(₹)
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

(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 = OL × FL = 6 × 2 = 12 times.

(d) ROI $= \frac{50,000}{10,00,000} \times 100 = 5\%$

Here ROI is calculated as ROE i.e. $\frac{\text{EAT} - \text{Pref.Dividend}}{\text{Equity share holders' fund}}$

(e) Operating Leverage = 6

$6 = \frac{\Delta \text{ EBIT}}{0.25}$

$\Delta \text{ EBIT} = \frac{6x1}{4} = 1.5$

Increase in EBIT = ₹ 2,00,000 × 1.5
= ₹ 3,00,000

New EBIT = ₹ 5,00,000

Q.46 % change in EPS | ICAI MAT

From the following information extracted from the books of accounts of Imax Ltd., CALCULATE percentage change in earnings per share, if sales increase by 10% and Fixed Operating cost is ₹ 1,57,500.

Particulars	*(₹)*
EBIT (Earnings before Interest and Tax)	*31,50,000*
Earnings before Tax (EBT)	*14,00,000*

Ans.

Operating Leverage (OL)

$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} = \frac{31,50,000 + ` 1,57,500}{31,50,000} = 1.05$

Financial Leverage (FL)

$= \frac{\text{EBIT}}{\text{EBT}} = \frac{31,50,000}{14,00,000} = 2.25$

Combined Leverage (CL)

= 1.05 x 2.25 = 2.3625

Percentage Change in Earnings per share

$\text{DCL} = \frac{\%\text{change in EPS}}{\%\text{change in Sales}} = 2.3625 = \frac{\%\text{change in EPS}}{10}$

% change in EPS = 23.625%

Hence, if sales increases by 10%, EPS will be increased by 23.625%.

Q.47 EAT | ICAI MAT

Consider the following information for Mega Ltd.:

Production level	2,500 units
Contribution per unit	₹ 150
Operating leverage	6
Combined leverage	24
Tax rate	30%

Required:

COMPUTE its earnings after tax.

Ans. **Workings:**

1. Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$

$$= \frac{150x\ 2,500}{\text{EBIT}} = \frac{3,\ 75,\ 000}{\text{EBIT}} = 6$$

$$\text{EBIT} = \frac{3,75,\ 000}{6}\ ₹ = ₹\ 62,500$$

2. Operating Leverage (OL) x Financial Leverage (FL)= Combined Leverage (CL)

6 x Financial Leverage = 24

Financial Leverage = 4

Also, Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = 4$

$$\frac{\text{EBT}}{4} = \frac{\text{EBIT}}{4} = \frac{62,500}{4} = ₹\ 15,625$$

Computation of Earnings after tax

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

= ₹ 15,625 (1 – 0.30) = ₹ 15,625 □ 0.70

Earnings after Tax (EAT) = ₹ 10,938

Q.48 PL Statement | ICAI MAT

From the following information, prepare Income Statement of Company A & B:

Particulars	*Company A*	*Company B*
Margin of safety	*0.20*	*0.25*
Interest	*₹ 3,000*	*₹ 2,000*
Profit volume ratio	*25%*	*33.33%*
Financial Leverage	*4*	*3*
Tax rate	*45%*	*45%*

Ans.

Income Statement

Particulars	Company A (₹)	Company B (₹)
Sales	80,000	36,000
Less: Variable Cost	60,000	24,000
Contribution	20,000	12,000
Less: Fixed Cost	16,000	9,000
EBIT	4,000	3,000
Less: Interest	3,000	2,000
EBT	1,000	1,000
Tax (45%)	450	450
EAT	550	550

Workings:

(i) **Company A**

Financial Leverage = EBIT/(EBIT- Interest)

4	= EBIT/(EBIT- ₹ 3,000)
4EBIT – ₹ 12,000	= EBIT
3EBIT	= ₹ 12,000
EBIT	= ₹ 4,000

Company B

Financial Leverage	= EBIT/(EBIT - Interest)
3	= EBIT/(EBIT – ₹ 2,000)
3EBIT – ₹ 6000	= EBIT
2EBIT	= ₹ 6,000
EBIT	= ₹ 3,000

(ii) Company A

Operating Leverage	= 1/Margin of Safety
= 1/0.20	= 5
Operating Leverage	= Contribution/EBIT
5	= Contribution/₹ 4,000
Contribution	= ₹ 20,000

Company B

Operating Leverage	= 1/Margin of Safety
= 1/0.25	= 4
Operating Leverage	= Contribution/EBIT
4	= Contribution/₹ 3,000
Contribution	= ₹ 12,000

(iii) Company A

Profit Volume Ratio	= 25%(Given)
Profit Volume Ratio	= Contribution/Sales x 100
25%	= ₹ 20,000/Sales
Sales	= ₹ 20,000/25%
Sales	= ₹ 80,000

Company B

Profit Volume Ratio	= 33.33%
Therefore, Sales	= ₹ 12,000/33.33%
Sales	= ₹ 36,000

Q.49 EPS | ICAI MAT

The Sale revenue of TM excellence Ltd. @ ₹ 20 Per unit of output is ₹ 20 lakhs and Contribution is ₹ 10 lakhs. At the present level of output, the DOL of the company is 2.5. The company does not have any Preference Shares. The number of Equity Shares are 1 lakh. Applicable corporate Income Tax rate is 50% and the rate of interest on Debt Capital is 16% p.a. CALCULATE the EPS (at sales revenue of ₹ 20 lakhs) and amount of Debt Capital of the company if a 25% decline in Sales will wipe out EPS.

Ans. **(i) Calculation of Fixed Cost**

$$DOL = \frac{Contribution}{Contribution - Fixed\ Cost} \text{ or } 2.5 = \frac{10,00,000}{EBIT} \text{ or } EBIT = ₹\ 4,00,000$$

EBIT = Contribution – Fixed Cost

₹ 4,00,000 = ₹ 10,00,000 – Fixed Cost
Fixed Cost = ₹ 10,00,000 - ₹ 4,00,000 = ₹ 6,00,000

(ii) Calculation of Degree of Combined Leverage (DCL)

Question says that 25% change in sales will wipe out EPS. Here, wipe out means it will reduce EPS by 100%.

$$DCL = \frac{\text{Percentage Change in EPS}}{\text{PercentageChange in Sales}} = \frac{100\%}{25\%} = 4$$

(iii) Calculation of Degree of Financial Leverage (DFL)

DCL = DOL x DFL
4 = 2.5 x DFL
So, DFL = 1.6

(iv) Calculation of Interest and amount of Debt

$$DFL = \frac{EBIT}{EBIT - Int} \text{ Or, } 1.6 = \frac{4,00,000}{4,00,000 - Int} \text{ Or, Int} = ₹\ 1,50,000$$

Debt x Interest rate = Amount of Interest
Debt x 16% = ₹ 1,50,000
Debt = ₹ 9,37,500

(v) Calculation of Earnings per share (EPS)

$$EPS = \frac{(EBIT - Int)(1 - t)}{N} = \frac{(`4,00,000 - `1,50,000)0.5}{1,00,000} = ₹\ 1.25$$

Q.50 FL / PV / EPS | ICAI MAT

The following details of a company for the year ended 31st March are given below:

Operating leverage	2:1
Combined leverage	2.5:1
Fixed Cost excluding interest	₹ 3.4 lakhs
Sales	₹ 50 lakhs
8% Debentures of ₹ 100 each	₹ 30.25 lakhs
Equity Share Capital of ₹ 10 each	34 lakhs
Income Tax Rate	30%

CALCULATE:

(i) Financial Leverage
(ii) P/V ratio and Earning per Share (EPS)
(iii) If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?
(iv) At what level of sales, the Earning before Tax (EBT) of the company will be equal to zero?

Ans. **(i) Financial leverage**

Combined Leverage	= Operating Leverage (OL) x Financial Leverage (FL)
2.5	= 2 x FL
Or, FL	= 1.25
Financial Leverage	= 1.25

(ii) P/V Ratio and Earning per share (EPS)

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

$2 = \frac{C}{C - 3,40,000}$

Or, $C = 2(C - 3,40,000)$

Or, $C = 2C - 6,80,000$

Or, Contribution = ₹ 6,80,000

Now, P/V ratio $= \frac{\text{Contribution}(C)}{\text{Sales}\ (S)} \times 100$

$= \frac{6,80,000}{50,00,000} \times 100 = 13.6\%$

Therefore, P/V Ratio = 13.6%

EBT = Sales – Variable Cost – Fixed Cost – Interest

= ₹50,00,000 – ₹50,00,000 (1-0.136) – ₹3,40,000 – (8% × ₹30,25,000)

= ₹ 50,00,000 – ₹ 43,20,000 – ₹ 3,40,000 – ₹ 2,42,000

= ₹ 98,000

PAT = EBT(1-T)= ₹ 98,000(1-0.3) = ₹ 68,600

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

EPS $= \frac{68,600}{3,40,000 \text{shares}}$ =₹ 0.202

(iii) Assets turnover

Assets turnover $= \frac{\text{Sales}}{\text{Total Assets}*}$

$= \frac{50,00,000}{34,00,000+30,25,000} = 0.78$

0.78 < 1.5 means lower than industry turnover.

*Total Asset = Equity share capital + 8% Debentures

(iv) EBT zero means 100% reduction in EBT. Since combined leverage is 2.5, sales have to be dropped by 100/2.5 = 40%. Hence new sales will be ₹ 50,00,000 □ (100 – 40) % = ₹ 30,00,000.
Therefore, at ₹ 30,00,000 level of sales, the Earnings before Tax (EBT) of the company will be zero.

Alternatively

Required sales when EBT is zero $= \frac{\text{FixedCost} + \text{Interest} + \text{desired Profit}}{P/\text{V Ratio}}$

$= \frac{3,40,000 + ` 2,42,000 + \text{zero}}{13.60\%}$

$$= \frac{5,82,000}{13.60\%}$$
= ₹ 42,79,412

[Note: The question can also be solved by first calculating EBIT with the help of Financial Leverage. Accordingly, answer to the requirement (ii) and (iv) will also vary.

Q.51 OL / CL | ICAI MAT

You are given the following information of 5 firms of the same industry:

Name of the Firm	Change in Revenue	Change in Operating Income	Change in Earning per share
M	28%	26%	32%
N	27%	34%	26%
P	25%	38%	23%
Q	23%	43%	27%
R	25%	40%	28%

You are required to CALCULATE for all firms:

(i) Degree of operating leverage and

(ii) Degree of combined leverage.

Ans. **Calculation of Degree of Operating leverage and Degree of Combined leverage**

Firm	Degree of Operating Leverage (DOL) = $\frac{\%\text{ change in Operating Income}}{\%\text{ change in Revenue}}$	Degree of Combined Leverage (DCL) = $\frac{\%\text{ change in EPS}}{\%\text{ change in Revenue}}$
M	$\frac{26\%}{28\%}$ = 0.929	$\frac{32\%}{28\%}$ = 1.143
N	$\frac{34\%}{27\%}$ = 1.259	$\frac{26\%}{27\%}$ = 0.963
P	$\frac{38\%}{25\%}$ = 1.520	$\frac{23\%}{25\%}$ = 0.920
Q	$\frac{43\%}{23\%}$ = 1.870	$\frac{27\%}{23\%}$ = 1.174
R	$\frac{40\%}{25\%}$ = 1.60	$\frac{28\%}{25\%}$ = 1.120

3 CHAPTER CAPITAL STRUCTURE

Q.1 Additional capital & MPS max | PY May 23

The following information pertains to CIZA Ltd.:

	₹
Capital Structure:	
Equity share capital (₹ 10	*8,00,000*
each) Retained earnings	*20,00,000*
9% Preference share capital (₹ 100 each)	*12,00,000*
12% Long-term loan	*10,00,000*
Interest coverage	*8*
ratio Income tax rate	*30%*
Price – earnings ratio	*25*

The company is proposed to take up an expansion plan, which requires an additional investment of ₹ 34,50,000. Due to this proposed expansion, earnings before interest and taxes of the company will increase by ₹ 6,15,000 per annum. The additional fund can be raised in following manner:

- By issue of equity shares at present market price, or
- By borrowing 16% Long-term loans from bank.

You are informed that Debt-equity ratio (Debt/ Shareholders' fund) in the range of 50% to 80% will bring down the price-earnings ratio to 22 whereas; Debt-equity ratio over 80% will bring down the price-earnings ratio to 18.

Required:

Advise which option is most suitable to raise additional capital so that the Market Price per Share (MPS) is maximized.

Ans.

Working notes:

(i) Interest Coverage ratio = 8

$$\frac{EBIT}{Interest} = 8$$

$$\frac{EBIT}{1,20,000} = 8$$

So, EBIT = ₹ 9,60,000

(ii) Proposed Earnings Before Interest & Tax = 9,60,000 + 6,15,000 = ₹ 15,75,000

Option 1: Equity option

Debt = ₹ 10,00,000

Shareholders Fund = 8,00,000+20,00,000+12,00,000+34,50,000 = ₹ 74,50,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{10,00,000}{74,50,000}$ = 13.42%

P/E ratio in this case will be 25 times

Option 2: Debt option

Debt = 10,00,000+34,50,000 = ₹ 44,50,000
Shareholders Fund = 8,00,000+20,00,000+12,00,000 = ₹ 40,00,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{44,50,000}{40,00,000}$ = 111.25%

Debt equity ratio has crossed the limit of 80% hence PE ratio in this case will remain at 18 times.
Number of Equity Shares to be issued = ₹ 34,50,000/ ₹ 150 = 23,000

(iii) Calculation of Earnings per Share and Market Price per share

Particulars	₹
Current Earnings Before Interest & Tax	9,60,000
Less: Interest	1,20,000
Earnings Before Tax	8,40,000
Less: Taxes	2,52,000
Earnings After Tax	5,88,000
Less: Preference Dividend (@9%)	1,08,000
Net earnings for Equity shareholders	4,80,000
Number of equity shares	80,000
Earnings Per Share	**6**
Price-earnings ratio	25
Market Price per share	**150**

Calculation of EPS and MPS under two financial options

Particulars	Financial Options	
	Option I Equity Shares Issued (₹)	Option II 16% Long Term Debt Raised (₹)
Earnings before interest and Tax (EBIT)	15,75,000	15,75,000
Less: Interest on old debentures @ 12%	1,20,000	1,20,000
Less: Interest on additional loan (new) @ 16% on ₹ 34,50,000	NIL	5,52,000
Earnings before tax	14,55,000	9,03,000
Less: Taxes @ 30%	4,36,500	2,70,900
(EAT/Profit after tax)	**10,18,500**	**6,32,100**
Less: Preference Dividend (@9%)	1,08,000	1,08,000
Net Earnings available to Equity shareholders	**9,10,500**	**5,24,100**
Number of Equity Shares	1,03,000	80,000
Earnings per Share (EPS)	**8.84**	**6.55**
Price/ Earnings ratio	25	18
Market price per share (MPS)	**221**	**117.9**

Advise: Equity option has higher Market Price per Share therefore company should raise additional fund through equity option.

Q.2 Additional Capital & EPS max | PY May 22

. The particulars relating to Raj Ltd. for the year ended 31st March, 2022 are given as follows:

Output (units at normal capacity)	*1,00,000*
Selling price per unit	*₹ 40*
Variable cost per unit	*₹ 20*
Fixed cost	*₹ 10,00,000*

The capital structure of the company as on 31st March, 2022 is as follows:

Particulars	***Amount in ₹***
Equity share capital (1,00,000 shares of ₹ 10 each)	*10,00,000*
Reserves and surplus	*5,00,000*
Current liabilities	*5,00,000*
Total	***20,00,000***

Raj Ltd. has decided to undertake an expansion project to use the market potential that will involve ₹ 20 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 15%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion program are planned:

		(Amount in ₹)
Alternative	***Debt***	***Equity Shares***
1	*5,00,000*	*Balance*
2	*10,00,000*	*Balance*
3	*14,00,000*	*Balance*

Current market price per share is ₹ 200.
Slab wise interest rate for fund borrowed is as follows:

Fund limit	***Applicable interest rate***
Up-to ₹ 5,00,000	*10%*
Over₹ 5,00,000 and up-to ₹ 10,00,000	*15%*
Over ₹ 10,00,000	*20%*

Find out which of the above-mentioned alternatives would you recommend for Raj Ltd. with reference to the EPS, assuming a corporate tax rate is 40%?

Ans.

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

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

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

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

Q.3 Calculate new EPS | PY Dec 21

Earnings before interest and tax of a company are ₹ 4,50,000. Currently the company has 80,000 Equity shares of ₹ 10 each, retained earnings of ₹ 12,00,000. It pays annual interest of ₹ 1,20,000 on 12% Debentures. The company proposes to take up an expansi on scheme for which it needs additional fund of ₹ 6,00,000. It is anticipated that after expansion, the company will be able to achieve the same return on investment as at present.
It can raise fund either through debts at rate of 12% p.a. or by issuing Eq uity shares at par. Tax rate is 40%.

Required:
Compute the earning per share if:
(i) The additional funds were raised through debts.
(ii) The additional funds were raised by issue of Equity shares.
Advise whether the company should go for expansion plan and which sources of finance should be preferred.

Ans

Working Notes:

(1) **Capital employed before expansion plan:**

	(₹)
Equity shares (₹ 10 × 80,000 shares)	8,00,000
Debentures {(₹ 1,20,000/12) □ 100}	10,00,000
Retained earnings	12,00,000
Total capital employed	**30,00,000**

(2) **Earnings before interest and tax (EBIT)** = 4,50,000

(3) **Return on Capital Employed (ROCE):**

ROCE = $\frac{\text{EBIT}}{\text{Capital employed}} \times 100 = \frac{4,50,000}{30,00,000} \times 100 = 15\%$

(4) **Earnings before interest and tax (EBIT) after expansion scheme:**
After expansion, capital employed = ₹ 30,00,000 + ₹ 6,00,000 = ₹ 36,00,000
Desired EBIT = 15% x ₹ 36,00,000 = **₹ 5,40,000**

(i) & (ii) Computation of Earnings Per Share (EPS) under the following options:

	Present situation	Expansion scheme Additional funds raised as	
		Debt (i)	Equity (ii)
	(₹)	(₹)	(₹)
Earnings before Interest	4,50,000	5,40,000	5,40,000

and Tax (EBIT)			
Less: Interest - Old Debt	1,20,000	1,20,000	1,20,000
- New Debt	--	**72,000** (₹ 6,00,000 x 12%)	--
Earnings before Tax (EBT)	3,30,000	3,48,000	4,20,000
Less: Tax (40% of EBT)	1,32,000	1,39,200	1,68,000
PAT/EAT	1,98,000	**2,08,800**	**2,52,000**
No. of shares outstanding	80,000	80,000	1,40,000
Earnings per Share (EPS)	2.475 $\left(\frac{1,98,000}{80,000}\right)$	**2.610** $\left(\frac{2,08,800}{80,000}\right)$	**1.800** $\left(\frac{2,52,000}{1,40,000}\right)$

Advise to the Company: When the expansion scheme is financed by additional debt, the EPS is higher. Hence, the company **should finance the expansion scheme by raising debt.**

Q.4 EPS / Fin. BEP / Indifference | PY Nov 20

J Ltd. is considering three financing plans. The-key information is as follows:

(a) Total investment to be raised ₹ 4,00,000.

(b) Plans showing the Financing Proportion:

Plans	*Equity*	*Debt*	*Preference Shares*
X	*100%*	-	-
Y	*50%*	*50%*	-
Z	*50%*	-	*50%*

(c) Cost of Debt 10% Cost of preference shares 10%

(d) Tax Rate 50%

(e) Equity shares of the face value of ₹10 each will be issued at a premium of ₹ 10 per share.

(f) Expected EBIT is ₹ 1,00,000.

You are required to compute the following for each plan :

(i) Earnings per share (EPS)

(ii) Financial break even point

(iii) Indifference Point between the plans and indicate if any of the plans dominate.(10 Marks)

Ans

(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

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

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.

Q.5 Form of Financing to choose | PY Nov 18

Y Limited requires ₹ 50,00,000 for a new project. This project is expected to yield earnings before interest and taxes of ₹ 10,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per' share. It has two alternatives to finance the project - by raising debt ₹ 5,00,000 or ₹ 20,00,000 and the balance, in each case, by issuing Equity Shares. The company's share is currently selling at ₹ 300, but is expected to decline to ₹ 250 in case the funds are borrowed in excess of ₹ 20,00,000. The funds can be borrowed at the rate of 12 percent upto ₹ 5,00,000 and at 10 percent over ₹ 5,00,000. The tax rate applicable to the company is 25 percent. Which form of financing should the company choose?

Ans.

Plan I = Raising Debt of Rs 5 lakh + Equity of Rs 45 lakh.
Plan II = Raising Debt of ₹ 20 lakh + Equity of ₹ 30 lakh.

Calculation of Earnings per share (EPS)

Particulars	Financial Plans	
	Plan I ₹	Plan II ₹
Expected EBIT	10,00,000	10,00,000
Less: Interest (Working Note 1)	(60,000)	(2,10,000)
Earnings before taxes	9,40,000	7,90,000
Less: Taxes @ 25%	(2,35,000)	(1,97,500)
Earnings after taxes (EAT)	7,05,000	5,92,500
Number of shares (Working Note 2)	15,000	10,000
Earnings per share (EPS)	47	59.25

Financing Plan II (i.e. Raising debt of ₹ 20 lakh and issue of equity share capital of ₹ 30 lakh) is the option which maximises the earnings per share.

Working Notes:

1. **Calculation of interest on Debt.**

Plan I	(₹ 5,00,000 x 12%)		₹ 60,000
Plan II	(₹ 5,00,000 x 12%)	₹ 60,000	₹ 2,10,000
	(₹ 15,00,000 x 10%)	₹ 1,50,000	

2. **Number of equity shares to be issued**

Plan I: $\frac{\text{Rs. } 45,\ 00,\ 000}{\text{Rs. } 300\ (\text{Market Price of share})}$ = 15,000 shares

Plan II: $\frac{\text{Rs. } 30,\ 00,\ 000}{\text{Rs. } 300\ (\text{Market Price of share})}$ = 10,000 shares

(*Alternatively, interest on Debt for Plan II can be 20,00,000 X 10% i.e. ₹ 2,00,000. accordingly, the EPS for the Plan II will be ₹60)

Q.6 EPS / Fin. BEP / Indifference | PY May 18

Sun Ltd. is considering two financing plans.
Details of which are as under:

(i) Fund's requirement – ₹ 100 Lakhs
(ii) Financial Plan

Plan	*Equity*	*Debt*
I	*100%*	-
II	*25%*	*75%*

(iii) Cost of debt – 12% p.a.
(iv) Tax Rate – 30%
(v) Equity Share ₹ 10 each, issued at a premium of ₹ 15 per share
(vi) Expected Earnings before Interest and Taxes (EBIT) ₹ 40 Lakhs

You are required to compute:
(i) EPS in each of the plan
(ii) The Financial Break Even Point
(iii) Indifference point between Plan I and II

Ans.

Computation of Earnings Per Share (EPS)

Plans	I (₹)	II (₹)
Earnings before interest & tax (EBIT)	40,00,000	40,00,000
Less: Interest charges (12% of ₹75 lakh)	--	(9,00,000)
Earnings before tax (EBT)	40,00,000	31,00,000
Less: Tax @ 30%	(12,00,000)	(9,30,000)
Earnings after tax (EAT)	28,00,000	21,70,000
No. of equity shares (@ ₹10+₹15)	4,00,000	1,00,000
E.P.S (₹)	7.00	21.70

(ii) Computation of Financial Break-even Points

Plan 'I' = 0 – Under this plan there is no interest payment, hence the financial break - even point will be zero.

Plan 'II' = ₹ 9,00,000 - Under this plan there is an interest payment of ₹9,00,000, hence the financial break -even point will be ₹9 lakhs

(iii) Computation of Indifference Point between Plan I and Plan II:

Indifference point is a point where EBIT of Plan-I and Plan-II are equal. This can be calculated by applying the following formula:

{(EBIT –I1) (1- T)} / E1 = {(EBIT –I2) (1- T)} / E2

So $\frac{EBIT(1-0.3)}{4,00,000 shares} = \frac{(EBIT - `9,00,000)(1-0.3)}{1,00,000 shares}$

Or, 2.8 EBIT – 25,20,000 = 0.7EBIT
Or, 2.1EBIT = 25,20,000
EBIT =12,00,000

Q.7 Calculate new MPS | RTP Nov 23

Prakash Limited provides you the following information:

	(₹)
Profit (EBIT)	3,00,000
Less: Interest on Debenture @ 10%	(50,000)
EBT	2,50,000
Less Income Tax @ 50%	(1,25,000)
	1,25,000
No. of Equity Shares (₹ 10 each)	25,000
Earnings per share (EPS)	5
Price /EPS (PE) Ratio	10

The company has reserves and surplus of ₹ 7,50,000 and required ₹ 5,00,000 further for modernisation. Return on Capital Employed (ROCE) is constant. Debt (Debt/ Debt + Equity) Ratio higher than 40% will bring the P/E

Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional capital is raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price

Ans. **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 $\left(50{,}000 x \frac{100}{10}\right)$	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 = $\frac{3,\ 00,\ 000}{15,00,000} x100$	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

Q.8 Indifference point | RTP May 23

Current Capital Structure of XYZ Ltd is as follows:
Equity Share Capital of 7 lakh shares of face value ₹ 20 each
Reserves of ₹ 10,00,000
9% bonds of ₹ 3,00,00,000
11% preference capital: 3,00,000 shares of face value ₹ 50 each

Additional Funds required for XYZ Ltd are ₹ 5,00,00,000. XYZ Ltd is evaluating the following alternatives:

I. Proposed alternative I: Raise the funds via 25% equity capital and 75% debt at 10%.
PE ratio in such scenario would be 12.

II. Proposed alternative II: Raise the funds via 50% equity capital and rest from 12% Preference capital .PE ratio in such scenario would be 11.

Any new equity capital would be issued at a face value of ₹ 20 each. Any new preferential capital would be issued at a face value of ₹ 20 each. Tax rate is 34%
DETERMINE the indifference point under both the alternatives.

Ans.

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,

$$EPS = \frac{(X - ` 64,50,000) \times 0.66 - ` 16,50,000}{13,25,000} \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

For Proposal II,

$$EPS = \frac{(X - ` 27,00,000) \times 0.66 - ` 46,50,000}{13,25,000} \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Equating (1) and (2),

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

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

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

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

Q.9 Calculate new MPS | RTP Nov 22

ABC Limited provides you the following information:

	(₹)
Profit (EBIT)	2,80,000
Less: Intt. on Debt @10%	40,000
EBT	2,40,000
Less: Income Tax @ 50%	1,20,000
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price / EPS (P/E) Ratio	10
Ruling Market price per share	40

The company has undistributed reserves of ₹ 7,00,000 and needs ₹ 4,00,000 further for expansion. This investment is expected to earn the same rate as funds already invested. You are informed that a debt equity (debt/ debt +equity) ratio higher than 32% will push the P/E ratio down to 8 and raise the interest rate on additional borrowings (debentures) to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional funds are raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price of ₹ 40 per share.

Ans.

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)	3,60,000	3,60,000
20% on (14,00,000 + 4,00,000)		
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	4.00
Price/ Earnings Ratio	8	10
Probable Price Per Share	36.24	40
	(8 x 4.53)	(10 x 4)

Working Notes:

		(₹)
1.	Calculation of Present Rate of Earnings	
	Equity Share capital (30,000 x ₹ 10)	3,00,000
	10% Debentures $\left(40,000x\frac{100}{10}\right)$	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 = $\left(\frac{2,80,000}{14,00,000}x100\right)$	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:	$\left(\frac{8,00,000}{18,00,000}x100\right)$

As the debt equity ratio is more than 32% the P/E ratio shall be 8 in plan (i) = 44.44%

Q.10 Indifference point & Dividend | RTP Nov 20

Xylo Ltd. is considering two alternative financing plans as follows:

Particulars	Plan – A (₹)	Plan – B (₹)
Equity shares of ₹ 10 each	8,00,000	8,00,000
Preference Shares of ₹ 100 each	-	4,00,000
12% Debentures	4,00,000	-
	12,00,000	12,00,000

The indifference point between the plans is ₹ 4,80,000. Corporate tax rate is 30%. CALCULATE the rate of dividend on preference shares.

Ans.

Computation of Rate of Preference Dividend

$$\frac{(\text{EBIT} - \text{Interest})(1-t)}{\text{No.of Equity Shares (N1)}} = \frac{\text{EBIT}(1-t) - \text{Preference Dividend}}{\text{No.of Equity Shares (N2)}}$$

$$\frac{(₹4,80,000 - ₹48,000) \times (1 - 0.30)}{80,00,000 \text{ shares}} = \frac{4,80,000(1-0.30) - \text{Preference Dividend}}{80,00,000 \text{ shares}}$$

$$\frac{3,02,400}{80,00,000 \text{ shares}} = \frac{3,36,000 - \text{Preference Dividend}}{80,00,000 \text{ shares}}$$

₹ 3,02,400 = ₹ 3,36,000 – Preference Dividend

Preference Dividend = ₹ 3,36,000 – ₹ 3,02,400 = ₹ 33,600

$$\text{Rate of Dividend} = \frac{\text{Preference Dividend}}{\text{Preference share capital}} \times 100$$

$$= \frac{33,600}{4,00,000} \times 100 = 8.4\%$$

Q.11 Indifference Point | RTP May 20

CALCULATE the level of earnings before interest and tax (EBIT) at which the EPS indifference point between the following financing alternatives will occur.

(i) Equity share capital of ₹60,00,000 and 12% debentures of ₹40,00,000.

Or

(ii) Equity share capital of ₹40,00,000, 14% preference share capital of ₹20,00,000 and 12% debentures of ₹40,00,000.

Assume the corporate tax rate is 35% and par value of equity share is ₹100 in each case.

Ans.

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

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

$$\text{EPS}_{\text{Alternative (i)}} = \frac{(\text{EBIT} - \text{Interest})(1 - \text{tax rate})}{\text{No.of equityshares}}$$

$$= \frac{(\text{EBIT} - 0.12 \times 40,00,000)(1 - 0.35)}{60,000 \text{ shares}}$$

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

$$EPS_{\text{Alternative (ii)}} = \frac{(EBIT - 0.12 \times 40,00,000)(1 - 0.35) - (0.14 \times 20,00,000)}{40,000 \text{shares}}$$

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

$$\frac{(EBIT - 0.12 \times 40,\ 00,\ 000)(1 - 0.35)}{60,000 \text{shares}} = \frac{(EBIT - 0.12 \times 40,\ 00,\ 000)(1 - 0.35) - (0.14 \times 20,00,\ 000)}{40,000 \text{shares}}$$

$$\text{Or } \frac{0.65\ EBIT - 3,12,000}{3} = \frac{0.65\ EBIT - ₹5,92,000}{2}$$

Or 1.30 EBIT − ₹6,24,000 = 1.95 EBIT - ₹17,76,000
Or (1.95 − 1.30) EBIT = ₹17,76,000 - ₹6,24,000 = ₹11,52,000
Or EBIT = $\frac{11,52,000}{0.65}$
Or EBIT = ₹17,72,308

Q.12 EPS / BEP | RTP Nov 19

The management of RT Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

Proposal	Equity shares (%)	Debts (%)	Preference shares (%)
P	100	-	-
Q	50	50	-
R	50	-	50

(i) Cost of debt and preference shares is 12% each.

(ii) Tax rate –40%

(iii) Equity shares of the face value of ₹10 each will be issued at a premium of ₹10 per share.

(iv) Total investment to be raised ₹8,00,00,000.

(v) Expected earnings before interest and tax ₹3,60,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point

COMPUTE the EBIT range among the plans for indifference.

Ans. **(i) Computation of Earnings per Share (EPS)**

Plans	P (₹)	Q (₹)	R (₹)
Earnings before interest & tax (EBIT)	3,60,00,000	3,60,00,000	3,60,00,000
Less: Interest charges	--	(48,00,000)	--
Earnings before tax (EBT)	3,60,00,000	3,12,00,000	3,60,00,000

Less : Tax @ 40%	(1,44,00,000)	(1,24,80,000)	(1,44,00,000)
Earnings after tax (EAT)	2,16,00,000	1,87,20,000	2,16,00,000
Less : Preference share dividend	--	--	(48,00,000)
Earnings available for equity shareholders	2,16,00,000	1,87,20,000	1,68,00,000
No. of equity shares	40,00,000	20,00,000	20,00,000
E.P.S	5.40	9.36	8.40

(ii) Computation of Financial Break-even Points

Proposal 'P' = 0

Proposal 'Q' = ₹48,00,000 (Interest charges)

Proposal 'R' = Earnings required for payment of preference share dividend i.e. ₹48,00,000 / 0.6 = ₹80,00,000

(iii) Computation of Indifference Point between the Proposals

Combination of Proposals

(a) Indifference point where EBIT of proposal "P" and proposal 'Q' is equal

$$\frac{EBIT(1-0.4)}{40,00,000 shares} = \frac{(EBIT - `48,00,000)(1-0.4)}{20,00,000 shares}$$

0.6 EBIT = 1.2 EBIT – ₹57,60,000

EBIT = ₹96,00,000

(b) Indifference point where EBIT of proposal 'P' and proposal 'R' is equal:

$$\frac{EBIT(1-0.40)}{40,00,000 shares} = \frac{EBIT(1-0.40) - 48,00,000}{20,00,000 shares}$$

$$\frac{0.6EBIT}{40,00,000 shares} = \frac{0.6EBIT - `48,00,000}{20,00,000 shares}$$

0.30 EBIT = 0.6 EBIT – ₹48,00,000

EBIT = $\frac{48,00,000}{0.30}$ = 1,60,00,000

(c) Indifference point where EBIT of proposal 'Q' and proposal 'R' are equal

$$\frac{(EBIT - 48,00,000)(1-0.4)}{20,00,000 shares} = \frac{EBIT(1-0.4) - `48,00,000}{20,00,000 shares}$$

There is no indifference point between proposal 'Q' and proposal 'R'

Q.13 Calculate New MPS | RTP May 19

Akash Limited provides you the following information:

	(₹)
Profit (EBIT)	2,80,000

Less: Interest on Debenture @ 10%	(40,000)
EBT	2,40,000
Less Income Tax @ 50%	(1,20,000)
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price /EPS (PE) Ratio	10

The company has reserves and surplus of ₹ 7,00,000 and required ₹ 4,00,000 further for modernisation. Return on Capital Employed (ROCE) is constant. Debt (Debt/ Debt + Equity) Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional capital are raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price.

Ans. Ascertainment of probable price of shares of Akash limited

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 and Tax (EBIT) {20% of new capital i.e. 20% of (₹14,00,000 + ₹4,00,000)} (Refer working note1)	3,60,000	3,60,000
Less: Interest on old debentures (10% of ₹4,00,000)	(40,000)	(40,000)
Less: Interest on new debt (12% of ₹4,00,000)	(48,000)	--
Earnings Before Tax (EBT)	2,72,000	3,20,000
Less: Tax @ 50%	(1,36,000)	(1,60,000)
Earnings for equity shareholders (EAT)	1,36,000	1,60,000
No. of Equity Shares (refer working note 2)	30,000	40,000
Earnings per Share (EPS)	₹ 4.53	₹ 4.00
Price/ Earnings (P/E) Ratio (refer working note 3)	8	10
Probable Price Per Share (PE Ratio × EPS)	₹ 36.24	₹ 40

Working Notes:

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

	(₹)
Equity Share capital (30,000 shares × ₹10)	3,00,000
10% Debentures $\left(40{,}000 x \frac{100}{10}\right)$	4,00,000
Reserves and Surplus	7,00,000

Total Capital Employed	14,00,000
Earnings before interest and tax (EBIT) (given)	2,80,000
ROCE = $\frac{2,80,000}{14,00,000} \times 100$	20%

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

= $\frac{4,00,000}{40}$ x 10,000 shares

Thus, after the issue total number of shares = 30,000+ 10,000 = 40,000 shares

3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:

= $\frac{8,00,000}{18,00,000}$ x 100 = 44.44%

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

Q.14 Compute New EPS | MTP Nov 23(2)

A Company earns a profit of ₹7,00,000 per annum after meeting its interest liability of ₹1,00,000 on 10% debentures. The Tax rate is 40%. The number of Equity Shares of ₹10 each are 1,00,000 and the retained earnings amount to ₹20,00,000. The company proposes to take up an expansion scheme for which a sum of ₹10,00,000 is required. It is anticipated that after expansion, the company will be able to achieve the same return on investment as at present. The funds required for expansion can be raised either through debt at the rate of 12% or by issuing equity shares at par.

Required:

(i) COMPUTE the Earnings per Share (EPS), if:
- ➢ The additional funds were raised as debt
- ➢ The additional funds were raised by issue of equity shares.

(ii) ADVISE the company as to which source of finance is preferable.

Ans. **Working Notes:**

1. Capital employed before expansion plan:

	(₹)
Equity shares (₹10 × 1,00,000 shares)	10,00,000
Debentures {(₹1,00,000/10) x 100}	10,00,000
Retained earnings	20,00,000
Total capital employed	40,00,000

2. Earnings before the payment of interest and tax (EBIT) :

	(₹)
Profit (EBT)	7,00,000
Add: Interest	1,00,000
EBIT	8,00,000

3. Return on Capital Employed (ROCE):

ROCE = $\frac{\text{EBIT}}{\text{Capital employed}} \times 100 = \frac{Rs.8,00,000}{Rs.40,00,000} \times 100 = 20\%$

4. Earnings before interest and tax (EBIT) after expansion scheme:

After expansion, capital employed = ₹40,00,000 + ₹10,00,000
= ₹ 50,00,000

Desired EBIT = 20% x ₹50,00,000 = ₹10,00,000

(i) Computation of Earnings Per Share (EPS) under the following options:

	Present situation	Expansion scheme Additional funds raised as	
		Debt	Equity
	(₹)	(₹)	(₹)
Earnings before Interest and Tax (EBIT)	8,00,000	10,00,000	10,00,000
Less: Interest - Old capital	1,00,000	1,00,000	1,00,000
- New capital	--	1,00,000 (₹10,00,000 x 10%)	--
Earnings before Tax (EBT)	7,00,000	8,00,000	9,00,000
Less: Tax (40% of EBT)	2,80,000	3,20,000	3,60,000
PAT	4,20,000	4,80,000	5,40,000
No. of shares outstanding	1,00,000	1,00,000	2,00,000
Earnings per Share (EPS)	4.20 $\left(\frac{4,20,000}{1,00,000}\right)$	4.80 $\left(\frac{4,80,000}{1,00,000}\right)$	2.70 $\left(\frac{5,40,000}{2,00,000}\right)$

(ii) Advise to the Company: When the expansion scheme is financed by additional debt, the EPS is higher. Hence, the company should finance the expansion scheme by raising debt.

Q.15 Compute EPS & Choose best EPS | MTP Nov 23(1)

Bhaskar Manufactures Ltd. have Equity Share Capital of ₹ 5,00,000 (face value ₹100) to meet the expenditure of an expansion programme, the company wishes to raise ₹ 3,00,000 and is having following four alternative sources to raise the funds:

Plan A: To have full money from equity shares.

Plan B: To have ₹ 1 lakhs from equity and ₹ 2 lakhs from borrowing from the financial institution @ 10% p.a.

Plan C: Full money from borrowing @ 10% p.a.

Plan D: ₹1 lakh in equity and ₹ 2 lakhs from preference shares at 8% p.a.

The company is expected to have an earning of ₹ 1,50,000. The corporate tax is 50%. Suggest a suitable plan of the above four plans to raise the required funds.

Ans. **Statement showing the EPS under the four plans**

	Plan A	Plan B	Plan C	Plan D
Equity share capital	₹ 8,00,000	₹ 6,00,000	₹ 5,00,000	₹ 6,00,000
8% Pref. Share capital	-	-	-	₹ 2,00,000
Borrowing @ 10%	-	₹ 2,00,000	₹ 3,00,000	-
	₹ 8,00,000	₹ 8,00,000	₹ 8,00,000	₹ 8,00,000
E.B.I.T	₹ 1,50,000	₹ 1,50,000	₹ 1,50,000	₹ 1,50,000
Less: Interest @ 10%		₹ 20,000	₹ 30,000	

E.B.T	₹ 1,50,000	₹ 1,30,000	₹1,20,000	₹ 1,50,000
Less: Tax	₹ 75,000	₹65,000	₹60,000	₹ 75,000
Less: Pref Divided				₹ 16,000
Earnings available to equity share holders	₹ 75,000	₹ 65,000	₹ 60,000	₹ 59,000
No.of equity shares (₹100)	8,000	6,000	5,000	6,000
Earning per share	**₹ 9.38**	**₹ 10.83**	**₹ 12.00**	**₹ 9.83**

Plan C given the highest EPS and therefore to be accepted.

Q.16 Indifference point (pref divd) MTP May 23(1)

Aeron We Ltd. is considering two alternative financing plans as follows:

Particulars	Plan – A (₹)	Plan – B (₹)
Equity shares of ₹ 100 each	90,00,000	90,00,000
Preference Shares of ₹ 100 each	-	20,00,000
9% Debentures	20,00,000	-
	1,10,00,000	1,10,00,000

The indifference point between the plans is ₹7,60,000. Corporate tax rate is 25%. CALCULATE the rate of dividend on preference shares.

Ans. Computation of Rate of Preference Dividend

$$\frac{(\text{EBIT} - \text{Interest})(1-t)}{\text{No. of Equity Shares } (N1)} = \frac{(\text{EBIT}(1-t) - \text{Preference Dividend}}{\text{No. of Equity Shares } (N2)}$$

$$\frac{(7,60,000 - 1,80,000) \times (1-0.25)}{90,000 \text{ shares}} = \frac{7,60,000\ (1-0.25) - \text{Preference Dividend}}{90,000 \text{ shares}}$$

$$\frac{4,35,000}{90,000 \text{ shares}} = \frac{5,70,000 - \text{Preference Dividend}}{90,000 \text{ shares}}$$

₹ 4,35,000 = ₹ 5,70,000 – Preference Dividend

Preference Dividend = ₹ 5,70,000 – ₹ 4,35,000 = ₹ 1,35,000

$$\text{Rate of Dividend} = \frac{\text{Preference Dividend}}{\text{Preference share capital}} \times 100$$

$$= \frac{1,35,000}{20,00,000} \times 100 = 6.75\ \%$$

Q.17 Calculate New EPS MTP May 23(1)

RML Limited needs ₹6,50,00,000 for the Expansion purposes. The following three plans are feasible:

(I) The Company may issue 6,50,000 equity shares at ₹100 per share.
(II) The Company may issue 4,00,000 equity shares at ₹100 per share and 2,50,000 debentures of ₹100 denomination bearing a 9% rate of interest.
(III) The Company may issue 4,00,000 equity shares at ₹100 per share and 2,50,000 cumulative preference shares at ₹100 per share bearing a 9% rate of dividend.

(i) If the Company's earnings before interest and taxes are ₹15,62,500, ₹22,50,000, ₹62,50,000, ₹93,75,000 and ₹1,56,25,000, CALCULATE the earnings per share under each of three financial plans? Assume a Corporate Income tax rate of 25%.

(ii) WHICH alternative would you recommend and why?

Ans.

Computation of EPS under three-financial plans.

Plan I: Equity Financing

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	15,62,500	22,50,000	62,50,000	93,75,000	1,56,25,000
Interest	0	0	0	0	0
EBT	15,62,500	22,50,000	62,50,000	93,75,000	1,56,25,000
Less: Tax @ 25%	3,90,625	5,62,500	15,62,500	23,43,750	39,06,250
PAT	11,71,875	16,87,500	46,87,500	70,31,250	1,17,18,750
No. of equity shares	6,50,000	6,50,000	6,50,000	6,50,000	6,50,000
EPS	1.80	2.60	7.21	10.82	18.03

Plan II: Debt – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	15,62,500	22,50,000	62,50,000	93,75,000	1,56,25,000
Less: Interest	22,50,000	22,50,000	22,50,000	22,50,000	22,50,000
EBT	(6,87,500)	0	40,00,000	71,25,000	1,33,75,000
Less: Tax @ 25%	1,71,875*	0	10,00,000	17,81,250	33,43,750
PAT	(5,15,625)	0	30,00,000	53,43,750	1,00,31,250
No. of equity shares	4,00,000	4,00,000	4,00,000	4,00,000	4,00,000
EPS (₹)	(1.29)	0.00	7.50	13.36	25.08

* 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	15,62,500	22,50,000	62,50,000	93,75,000	1,56,25,000
Less: Interest	0	0	0	0	0
EBT	15,62,500	22,50,000	62,50,000	93,75,000	1,56,25,000
Less: Tax @ 25%	3,90,625	5,62,500	15,62,500	23,43,750	39,06,250
PAT	11,71,875	16,87,500	46,87,500	70,31,250	1,17,18,750
Less: Pref. dividend *	22,50,000	22,50,000	22,50,000	22,50,000	22,50,000
PAT after Pref. dividend.	(10,78,125)	(5,62,500)	24,37,500	47,81,250	94,68,750
No. of Equity shares	4,00,000	4,00,000	4,00,000	4,00,000	4,00,000
EPS	(2.70)	(1.41)	6.09	11.95	23.67

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

(ii) In case of lower EBIT Plan I i.e Equity Financing is better however in case of higher EBIT Plan II i.e Debt=Equity Mix is best.

Q.18 Interest / EPS | MTP Nov 22(2)

Axar Ltd. has a Sales of ₹ 68,00,000 with a Variable cost Ratio of 60%.

The company has fixed cost of ₹16,32,000. The capital of the company comprises of 12% long term debt, ₹1,00,000 Preference Shares of ₹ 10 each carrying dividend rate of 10% and 1,50,000 equity shares.

The tax rate applicable for the company is 30%.

At current sales level, DETERMINE the Interest, EPS and amount of debt for the firm if a 25% decline in Sales will wipe out all the EPS.

Ans.

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

Q.19 Change in Earnings | MTP May 22(2)

Following data is available in respect of two companies having same business risk: Capital employed = ₹ 4,00,000, EBIT = ₹ 60,000 and Ke = 12.5%

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@10%)	2,00,000	Nil
Equity	2,00,000	4,00,000

An investor is holding 15% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

Ans.

Valuation of firms

Particulars	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	60,000	60,000

Less: Interest on debt (10% × ₹ 2,00,000)	20,000	Nil
Earnings available to Equity shareholders	40,000	60,000
Ke	12.5%	12.5%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	3,20,000	4,80,000
Debt (D)	2,00,000	Nil
Value of Firm (V) = S + D	5,20,000	4,80,000

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.

Investment & Borrowings	**(₹)**
Sell shares in Levered company (₹ 3,20,000 x 15%)	48,000
Borrow money (₹ 2,00,000 x 15%)	30,000
Buy shares in Unlevered company	78,000

Change in Return	**(₹)**
Income from shares in Unlevered company (₹ 78,000 x 12.5%)	9,750
Less: Interest on loan (₹ 30,000 x 10%)	3,000
Net Income from unlevered firm	6,750
Less: Income from Levered firm (₹ 48,000 x 12.5%)	6,000
Incremental Income due to arbitrage	750

Q.20 Calculate New EPS | MTP May 22(2)

(a) The Modern Chemicals Ltd. requires ₹ 25,00,000 for a new plant. This plant is expected to yield earnings before interest and taxes of ₹ 5,00,000. While deciding about the financial plan, the company considers the objective of maximising earnings per share. It has three alternatives to finance the project- by raising debt of ₹ 2,50,000 or ₹ 10,00,000 or ₹ 15,00,000 and the balance, in each case, by issuing equity shares. The company's share is currently selling at ₹ 150, but is expected to decline to ₹ 125 in case the funds are borrowed in excess of ₹ 10,00,000. The funds can be borrowed at the rate of 10% upto ₹ 2,50,000, at 15% over ₹ 2,50,000 and upto ₹ 10,00,000 and at 20% over ₹ 10,00,000. The tax rate applicable to the company is 50%. ANALYSE, which form of financing should the company choose?

(b) "Operating risk is associated with cost structure, whereas financial risk is associated with capital structure of a business concern." Critically EXAMINE this statement.

Ans. (a) Calculation of Earnings per share for three alternatives to finance the project

Particulars	**Alternatives**		
	I **To raise debt of ₹2,50,000 and equity of ₹22,50,000** **(₹)**	**II** **To raise debt of ₹ 10,00,000 and equity of ₹ 15,00,000** **(₹)**	**III** **To raise debt of ₹ 15,00,000 and equity of ₹ 10,00,000** **(₹)**

Earnings before interest and tax	5,00,000	5,00,000	5,00,000
Less: Interest on debt at the rate of	25,000 (10% on ₹ 2,50,000)	1,37,500 (10% on ₹ 2,50,000) (15% on ₹ 7,50,000)	2,37,500 (10% on ₹ 2,50,000) (15% on ₹ 7,50,000) (20% on ₹ 5,00,000)
Earnings before tax	4,75,000	3,62,500	2,62,500
Less: Tax (@ 50%)	2,37,500	1,81,250	1,31,250
Earnings after tax: (A)	2,37,500	1,81,250	1,31,250
Number of shares :(B) (Refer to working note)	15,000	10,000	8,000
Earnings per share: (A)/(B)	15.833	18.125	16.406

So, the earning per share (EPS) is higher in alternative II i.e. if the company finance the project by raising debt of ₹ 10,00,000 and issue equity shares of ₹ 15,00,000. Therefore, the company should choose this alternative to finance the project.

Working Note:

	Alternatives		
	I	**II**	**III**
Equity financing : (A)	₹ 22,50,000	₹ 15,00,000	₹ 10,00,000
Market price per share : (B)	₹ 150	₹ 150	₹ 125
Number of equity share: (A)/(B)	15,000	10,000	8,000

(b) "Operating risk is associated with cost structure whereas financial risk is associated with capital structure of a business concern".

Operating risk refers to the risk associated with the firm's operations. It is represented by the variability of earnings before interest and tax (EBIT). The variability in turn is influenced by revenues and expenses, which are affected by demand of firm's products, variations in prices and proportion of fixed cost in total cost. If there is no fixed cost, there would be no operating risk. Whereas financial risk refers to the additional risk placed on firm's shareholders as a result of debt and preference shares used in the capital structure of the concern. Companies that issue more debt instruments would have higher financial risk than companies financed mostly by equity.

Q.21 Indifference Point | MTP Dec 21(2)

ABC Limited is setting up a project with a capital outlay of ₹ 90,00,000. It has two alternatives in financing the project cost.

Alternative-I: 100% equity finance by issuing equity shares of ₹ 10 each

Alternative-II: Debt-equity ratio 2:1 (issuing equity shares of ₹ 10 each)

The rate of interest payable on the debts is 18% p.a. The corporate tax rate is 30%. CALCULATE the indifference point between the two alternative methods of financing.

Ans. **Calculation of Indifference point between the two alternatives of financing.**

Alternative-I By issue of 9,00,000 equity shares of ₹10 each amounting to ₹ 90 lakhs. No financial charges are involved.

Alternative-II By raising the funds in the following way: Debt = ₹ 60 lakhs

Equity = ₹ 30 lakhs (3,00,000 equity shares of ₹ 10 each)

Interest payable on debt = 60,00,000 × $\frac{18}{100}$ = ₹ 10,80,000

The difference point between the two alternatives is calculated by:

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

$$\frac{(EBIT - 0)(1-0.30)}{9,00,000} = \frac{(EBIT - 10,80,000)(1-0.30)}{3,00,000}$$

$$\frac{(EBIT)(0.70)}{9,00,000} = \frac{(EBIT - 10,80,000)(0.70)}{3,00,000}$$

$$\frac{EBIT(0.70)}{3} = \frac{0.70(EBIT - 10,80,000)}{1}$$

EBIT = 3EBIT–32,40,000

–2 EBIT = –32,40,000

EBIT = $\frac{32,40,000}{2}$

EBIT = ₹ 16,20,000

Therefore, at EBIT of ₹ 16,20,000, earnings per share for the two alternatives is equal.

Q.22 Financial BEP | MTP Dec 21 (2)

Sophisticated Limited is considering three financing plans. The key information is as follows:

(a) Total investment amount to be raised ₹ 4,00,000

(b) Plans of Financing Proportion:

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c) Cost of debt 10%

Cost of preference shares 10%

(d) Tax rate 30%

(e) Equity shares of the face value of ₹ 10 each will be issued at a premium of ₹ 10 per share.

(f) Expected EBIT is ₹ 10,00,000.

You are required to DETERMINE for each plan: -

(i) Earnings per share (EPS)

(ii) The financial break-even point.

(iii) Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.

Ans. **(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% × ₹2 lakh)	---
Earnings before tax (EBT)	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% × ₹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 or preference dividend payment. 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 point 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 point between different plans of financing.

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

$$\frac{(EBIT - 0)(1-0.3)}{20000} = \frac{(EBIT - 20,000)(1-0.3)}{10,000}$$

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

$$\frac{(EBIT - 0)(1 - 0.3)}{20000} = \frac{(EBIT - 0)(1 - 0.3) - 20,000}{10,000}$$

0.7 EBIT (10,000) = (0.7 EBIT – 20,000) (20,000)

7000 EBIT = 14,000 EBIT – 40 crores

EBIT = 57,142.86

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

$$\frac{(EBIT - 20,000)(1 - 0.3)}{10000} = \frac{(EBIT - 0)(1 - 0.3) - 20,000}{10,000}$$

(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.

Q.23 Indifference Point | MTP May 21(1)

HN Limited is considering total investment of Rs. 20 lakhs. You are required to CALCULATE the level of earnings before interest and tax (EBIT) at which the EPS indifference point between the following financing alternatives will occur:

(i) Equity share capital of Rs. 12,00,000 and 14% debentures of Rs. 8,00,000.

Or

(ii) Equity share capital of Rs. 8,00,000, 16% preference share capital of Rs. 4,00,000 and 14% debentures of Rs. 8,00,000.

Assume the corporate tax rate is 30% and par value of equity share is Rs.10 in each case.

Ans.

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

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

$$EPS_{\text{Alternative (i)}} = \frac{(EBIT - \text{Interest})(1 - \text{tax rate})}{\text{No.of equity shares}} = \frac{(EBIT - 0.14 \times 8,00,000)(1 - 0.3)}{1,20,000 \text{shares}}$$

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

$$EPS_{\text{Alternative (ii)}} = \frac{(EBIT - \text{Interest})(1 - \text{tax rate}) - PD}{\text{No.of equity shares}}$$

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

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

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

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

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

Or 0.70 EBIT = Rs. 2,70,400

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

Or EBIT = Rs. 3,86,285.71 (approx.)

Q.24 Indifference Point | MTP Nov 19

RPS Company presently has Rs. 36,00,000 in debt outstanding bearing an interest rate of 10 percent. It wishes to finance a Rs. 40,00,000 expansion programme and is considering three alternatives: additional debt at 12 per cent interest, preferred stock with an 11 per cent dividend, and the sale of common stock at Rs. 16 per share. The company presently has 8,00,000 shares of common stock outstanding and is in a 40 per cent tax bracket.

(i) If earnings before interest and taxes are presently Rs. 15,00,000, CALCULATE earnings per share for the three alternatives, assuming no immediate increase in profitability?

(ii) CALCULATE indifference point between debt and common stock.

Ans. (i)

(Rs. in thousands)

	Debt	Preferred Stock	Common Stock
	Rs.	Rs.	Rs.
EBIT	1,500	1,500	1,500
Interest on existing debt	360	360	360
Interest on new debt	480		
Profit before taxes	660	1,140	1,140
Taxes	264	456	456
Profit after taxes	396	684	684
Preferred stock dividend		440	
Earnings available to common shareholders	396	244	684
Number of shares	800	800	1,050
Earnings per share	.495	.305	.651

(ii) Mathematically, the indifference point between debt and common stock is (Rs in thousands):

$$\frac{EBIT^* - Rs.\ 840}{800} = \frac{EBIT^* - Rs.\ 360}{1,050}$$

EBIT* (1,050) – Rs. 840(1,050) = EBIT* (800) – Rs. 360 (800)

250EBIT* = Rs. 5,94,000

EBIT* = Rs. 2,376

Q.25 EPS / BEP | MTP Nov 18(1)

(i) Cost of debt and preference shares is 10% each.

(ii) Tax rate – 50%

(iii) Equity shares of the face value of Rs. 10 each will be issued at a premium of Rs. 10 per share.

(iv) Total investment to be raised Rs. 40,00,000.

(iv) Expected earnings before interest and tax Rs. 18,00,000.

Proposal	Equity shares (%)	Debts (%)	Preference shares (%)
P	100	-	-
Q	50	50	-
R	50	-	50

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point

COMPUTE the EBIT range among the plans for indifference. Also indicate if any of the plans dominate.

Ans.

(i) Computation of Earnings per Share (EPS)

Plans	P (Rs.)	Q (Rs.)	R (Rs.)
Earnings before interest & tax (EBIT)	18,00,000	18,00,000	18,00,000
Less: Interest charges	--	(2,00,000)	--
Earnings before tax (EBT)	18,00,000	16,00,000	18,00,000
Less: Tax @ 50%	(9,00,000)	(8,00,000)	(9,00,000)
Earnings after tax (EAT)	9,00,000	8,00,000	9,00,000
Less: Preference share dividend	--	--	(2,00,000)
Earnings available for equity shareholders	9,00,000	8,00,000	7,00,000
No. of equity shares	2,00,000	1,00,000	1,00,000
E.P.S	4.5	8	7

Computation of Financial Break-even Points

Proposal 'P' = 0

Proposal 'Q' = Rs. 2,00,000 (Interest charges)

Proposal 'R' = Earnings required for payment of preference share dividend i.e. Rs. 2,00,000 x 0.5 (Tax Rate) = Rs. 4,00,000

(iii) Computation of Indifference Point between the Proposals

Combination of Proposals

(a) Indifference point where EBIT of proposal "P" and proposal 'Q' is equal

$$\frac{EBIT(1-0.5)}{2,00,000 shares} = \frac{(EBIT - Rs.2,00,000)(1-0.5)}{1,00,000 shares}$$

0.5 EBIT = EBIT – Rs. 2,00,000

EBIT = Rs. 4,00,000

(b) Indifference point where EBIT of proposal 'P' and proposal 'R' is equal:

$$\frac{EBIT(1-0.50)}{2,00,000 shares} = \frac{EBIT(1-0.50) - Rs.2,00,000}{1,00,000 shares}$$

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

0.25 EBIT = 0.5 EBIT – Rs. 2,00,000

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

(c) Indifference point where EBIT of proposal 'Q' and proposal 'R' are equal

$$\frac{(EBIT - Rs.2,00,000)(1 - 0.5)}{1,00,000 shares} = \frac{EBIT(1 - 0.5) - Rs.2,00,000}{1,00,000 shares}$$

0.5 EBIT – Rs.1,00,000 = 0.5 EBIT – Rs.2,00,000

There is no indifference point between proposal 'Q' and proposal 'R'

Analysis: It can be seen that financial proposal 'Q' dominates proposal 'R', since the financial break-even-point of the former is only Rs. 2,00,000 but in case of latter, it is Rs . 4,00,000.

Q.26 Removed from Syllabus | MTP May 18

Sundaram Ltd. discounts its cash flows at 16% and is in the tax bracket of 35%. For the acquisition of a machinery worth ₹10,00,000, it has two options – either to acquire the asset by taking a bank loan @ 15% p.a. repayable in 5 yearly instalments of ₹ 2,00,000 each plus interest or to lease the asset at yearly rentals of ₹ 3,34,000 for five (5) years. In both the cases, the instalment is payable at the end of the year. Depreciation is to be applied at the rate of 15% using 'written down value' (WDV) method. You are required to STATE with reason which of the financing options is to be exercised.

Year	1	2	3	4	5
P.V factor @16%	0.862	0.743	0.641	0.552	0.476

Ans.

Alternative I: Acquiring the asset by taking bank loan:

	Years	1	2	3	4	5
(a)	Interest (@15% p.a. on opening balance)	1,50,000	1,20,000	90,000	60,000	30,000
	Depreciation (@15%WDV)	1,50,000	1,27,500	1,08,375	92,119	78,301
		3,00,000	2,47,500	1,98,375	1,52,119	1,08,301
(b)	Tax shield (@35%)	1,05,000	86,625	69,431	53,242	37,905
	Interest less Tax shield (a)-(b)	45,000	33,375	20,569	6,758	(7,905)
	Principal Repayment	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
	Total cash outflow	2,45,000	2,33,375	2,20,569	2,06,758	1,92,095
	Discounting Factor @ 16%	0.862	0.743	0.641	0.552	0.476
	Present Value	2,11,190	1,73,398	1,41,385	1,14,130	91,437

Total P.V of cash outflow = ₹7,31,540

Alternative II: Acquire the asset on lease basis

Year	Lease Rentals (₹)	Tax Shield @35%	Net Cash Outflow	Discount Factor	Present Value
1	3,34,000	1,16,900	2,17,100	0.862	1,87,140
2	3,34,000	1,16,900	2,17,100	0.743	1,61,305
3	3,34,000	1,16,900	2,17,100	0.641	1,39,161
4	3,34,000	1,16,900	2,17,100	0.552	1,19,839
5	3,34,000	1,16,900	2,17,100	0.476	1,03,340

Present value of Total Cash out flow	7,10,785

By making analysis of both the alternatives, it is observed that the present value of the cash outflow is lower in alternative II by ₹ 20,755 (i.e. ₹ 731,540 – ₹ 7,10,785) Hence, it is suggested to acquire the asset on lease basis.

Q.27 EPS / BEP | MTP May 18

XYZ Ltd. is considering three financial plans for which the key information is as below:

(i) Total investment to be raised ₹4,00,000.

(ii) Plans of Financing Proportion

Plans	Equity	Debt	Preference shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(iii) Cost of debt 8%
Cost of preference shares 8%

(iv) Tax Rate is 50%

(v) Equity shares of the face value of ₹10 each will be issued at a premium of ₹10 per share.

(vi) Expected EBIT is ₹1,60,000

DETERMINE for each plan:

(i) Earnings per share (EPS)

(ii) Financial break-even point.

(iii) COMPUTE the EBIT range among the plans A and C for point of indifference .

Ans.

(i) Computation of Earnings per Share (EPS) for each Plan

Particulars	Plan A ₹	Plan B ₹	Plan C ₹
Earnings Before Interest Tax (EBIT)	1,60,000	1,60,000	1,60,000
Less: Interest on debt at 8%	---	(16,000)	---
Earnings Before Tax	1,60,000	1,44,000	1,60,000
Less: Tax at 50%	80,000	72,000	80,000
Earnings After Tax	80,000	72,000	80,000
Less: Preference Dividend at 8%	---	---	16,000
Earnings available for equity shareholders	80,000	72,000	64,000
Number of Equity Shares	20,000	10,000	10,000
Earnings per share (EPs)	₹4.00	₹7.20	₹6.40

(ii) Financial Break-even Point for Each Plan

Plan A : There is no fixed financial charges, hence the financial break -even point for Plan A is zero.

Plan B : Fixed interest charges is ₹16,000, hence the financial break-even point for Plan B is ₹16,000

Plan C : Fixed charge for preference dividend is ₹16,000, hence, the financial break-even point for Plan C is ₹16,000

(iii) Indifference point between Plan A and C

$$\frac{(X - 0)(1 - 0.5) - 0}{20,000} = \frac{(X - 0)(1 - 0.5) - 16,000}{10,000 \text{shares}}$$

0.5X

Or $\frac{0.5X}{20,000} = \frac{0.5X - 16,000}{10,000}$ or, 0.5X - X= -32,000 or, 0.5X = 32,000

or, X = ₹ 64,000

Thus point of indifference between plan A and C is ₹64,000.

4 CHAPTER
CAPITAL STRUCTURE THEORY

Q.1 MM Hypothesis | PY July 21

The details about two companies R Ltd. and S Ltd. having same operating risk are given below:

Particulars	*R Ltd.*	*S Ltd.*
Profit before interest and tax	*₹ 10 lakhs*	*₹ 10 lakhs*
Equity share capital ₹ 10 each	*₹ 17 lakhs*	*₹ 50 lakhs*
Long term borrowings @ 10%	*₹ 33 lakhs*	*-*
Cost of Equity (Ke)	*18%*	*15%*

You are required to:

(1) Calculate the value of equity of both the companies on the basis of M.M. Approach without tax.

(2) Calculate the Total Value of both the companies on the basis of M.M. Approach without tax.

Ans. **(1) Computation of value of equity on the basis of MM approach without tax**

Particulars	**R Ltd. (₹ in lakhs)**	**S Ltd. (₹ in lakhs)**
Profit before interest and taxes	10	10
Less: Interest on debt (10% × ₹ 33,00,000)	3.3	-
Earnings available to Equity shareholders	6.7	10
Ke	18%	15%
Value of Equity (Earnings available to Equity shareholders/Ke)	**37.222**	**66.667**

(1) Computation of total value on the basis of MM approach without tax

Particulars	**R Ltd. (₹ in lakhs)**	**S Ltd. (₹ in lakhs)**
Value of Equity (S) (as calculated above)	37.222	66.667
Debt (D)	33	-
Value of Firm (V) = S + D	**70.222**	**66.667**

Q.2 Implied equity rate of | PY Jan 21

A Limited and B Limited are identical except for capital structures. A Ltd. has 60 per cent debt and 40 per cent equity, whereas B Ltd. has 20 per cent debt and 80 per cent equity. (All percentages are in market-value terms.) The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) (i) If X, owns 3 per cent of the equity shares of A Ltd., determine his return i f the Company has net operating income of ₹ 4,50,000 and the overall capitalization rate of the company, (Ko) is 18 percent.

(ii) Calculate the implied required rate of return on equity of A Ltd.

(b) B Ltd. has the same net operating income as A Ltd.

(i) Calculate the implied required equity return of B Ltd.

(ii) Analyse why does it differ from that of A Ltd.

Ans. (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%

(ii) 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 capitalisation 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.

Q.3 MM Hypothesis | PY Nov 18

The following data relate to two companies belonging to the same risk class :

Particulars	A Ltd.	B Ltd.
Expected Net Operating Income	₹ 18,00,000	₹ 18,00,000
12% Debt	₹ 54,00,000	-
Equity Capitalization Rate	-	18

Required:

(a) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.

(b) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

Ans. **(a) Assuming no tax as per MM Approach.**

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

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (Vu) = [NOI/ke] = 18,00,000/0.18 = ₹ 1,00,00,000

Ke of Unlevered Firm (given) = 0.18

Ko of Unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Nil) = ₹ 1,00,00,000 + (54,00,000 × nil)

= ₹1,00,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

	Particulars	A Ltd.	B Ltd.
A.	Net Operating Income (NOI)	18,00,000	18,00,000
B.	Less: Interest on Debt (I)	6,48,000	-
C.	Earnings of Equity Shareholders (NI)	11,52,000	18,00,000
D	Overall Capitalization Rate (ko)	0.18	0.18
E	Total Value of Firm (V = NOI/ko)	1,00,00,000	1,00,00,000
F	Less: Market Value of Debt	54,00,000	-
G	Market Value of Equity (S)	46,00,000	1,00,00,000
H	Equity Capitalization Rate [ke = NI /S]	0.2504	0.18
I	Weighted Average Cost of Capital [WACC (ko)]* ko = (ke×S/V) + (kd×D/V)	0.18	0.18

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	46,00,000	0.46	0.2504	0.1152
Debt	54,00,000	0.54	0.12*	0.0648
Total	81,60,000			0.18

*Kd = 12% (since there is no tax) WACC = 18%

(b) Assuming 40% taxes as per MM Approach

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

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of unlevered Firm (Vu) = [NOI (1 - t)/ke] = 18,00,000 (1 – 0.40)] / 0.18

= ₹60,00,000

Ke of unlevered Firm (given) = 0.18
Ko of unlevered Firm (Same as above = ke as there is no debt) = 0.18
Market Value of 'A Ltd' [Levered Firm (I)]
Total Value of Levered Firm (VL) = Vu + (Debt× Tax)
= ₹ 60,00,000 + (54,00,000 × 0.4)
= ₹ 81,60,000

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'
= 18% (i.e. Ke = Ko)

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of a Ltd

Particulars	A Ltd.
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [ke = NI/S]	0.2504
Weighted Average Cost of Capital (ko)* ko = (ke×S/V) + (kd×D/V)	13.23

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000			0.1323

*Kd= 12% (1- 0.4) = 12% × 0.6 = 7.2% WACC = 13.23%

Q.4 MM Hypothesis | PY May 18

Stopgo Ltd, an all equity financed company, is considering the repurchase of ₹ 200 lakhs equity and to replace it with 15% debentures of the same amount. Current market Value of the company is ₹ 1140 lakhs and it's cost of capital is 20%. It's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future. It's entire earnings are distributed as dividend. Applicable tax rate is 30 per cent.

You are required to calculate the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Hypothesis:

(i) The market value of the company
(ii) It's cost of capital, and
(iii) It's cost of equity

Ans. **Working Note**

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

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

Therefore, Net Income to equity-holders = ₹ 228 lakhs
EBIT = ₹ 228 lakhs / 0.7 = ₹ 325.70 lakhs

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

(i) **Market value of levered firm** = **Value of unlevered firm + Tax Advantage**
= ₹ 1,140 lakhs + (₹200 lakhs x 0.3)
= ₹ 1,200 lakhs

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

Calculation of Cost of Equity

Ke = (Net Income to equity holders / Equity Value) X 100
= (207 lakhs / 1200 lakhs – 200 lakhs) X 100
= (207/ 1000) X 100
= 20.7 %

(ii) **Cost of Capital**

Components	Amount (₹ In lakhs)	Cost of Capital %	Weight	WACC %
Equity	1000	20.7	83.33	17.25
Debt	200	(15% X 0.7) =10.5	16.67	1.75
	1200			19.00

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

(iii) Cost of Equity is 20.7% [As calculated in point (i)]
The impact is that cost of equity has risen by 0.7% i.e. 20.7% - 20% due to the presence of financial risk. Further, Cost of Capital and Cost of equity can also be calculated with the help of formulas as below, though there will be no change in final answers.

Cost of Capital (Ko) = Keu(1-tL) Where,

Keu = Cost of equity in an unlevered company

t = Tax rate

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

$$Ko = 0.2 \times \left(1 - \frac{200\text{lakh}}{1,200\text{lakh}} x 0.3\right)$$

So, Cost of capital = 0.19 or 19%

$$\text{Cost of Equity (Ke)} = Keu + (Keu - Kd)\ \frac{\text{Debt}\ (1 - t)}{\text{Equity}}$$

Where,

Keu = Cost of equity in an unlevered company

Kd = Cost of debt

t = Tax rate

$$Ke = 0.20 + \left(0.20 - 0.15 \times \frac{200\ \text{lakh} \times 0.7}{1,000\ \text{lakh}}\right)$$

Ke = 0.20 + 0.007 = 0.207 or 20.7%

So, Cost of Equity = 20.70%

Q.5 MM Hypothesis | RTP May 22

The following data relates to two companies belonging to the same risk class:

Particulars	Bee Ltd.	Cee Ltd.
12% Debt	₹ 27,00,000	-
Equity Capitalization Rate	-	18
Expected Net Operating Income	₹ 9,00,000	₹ 9,00,000

You are required to:

(a) DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.

(b) DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

Ans. **(a) Assuming no tax as per MM Approach.**

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (Vu) = [NOI/ke] = 9,00,000/0.18 = ₹ 50,00,000

Ke of Unlevered Firm (given) = 0.18

Ko of Unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'Bee Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Nil)

= ₹ 50,00,000 + (27,00,000 × nil)

= ₹ 50,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

Particulars	Bee Ltd.
Net Operating Income (NOI)	9,00,000
Less: Interest on Debt (I)	3,24,000
Earnings of Equity Shareholders (NI)	5,76,000
Overall Capitalization Rate (k_o)	0.18
Total Value of Firm ($V = NOI/k_o$)	50,00,000
Less: Market Value of Debt	27,00,000
Market Value of Equity (S)	23,00,000
Equity Capitalization Rate [k_e = NI /S]	0.2504
Weighted Average Cost of Capital (k_o)* $k_o = (k_e \times S/V) + (k_d \times D/V)$	0.18

*Computation of WACC Bee Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	23,00,000	0.46	0.2504	0.1152
Debt	27,00,000	0.54	0.12*	0.0648
Total	50,00,000			0.18

*Kd = 12% (since there is no tax) WACC = 18%

(b) Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered(u)]

Total Value of unlevered Firm (Vu) = [NOI (1 - t)/ke] = 9,00,000 (1 – 0.40)] / 0.18
= ₹ 30,00,000

Ke of unlevered Firm (given) = 0.18
Ko of unlevered Firm (Same as above = ke as there is no debt) = 0.18
Market Value of 'Bee Ltd' [Levered Firm (I)]
Total Value of Levered Firm (VL) = Vu + (Debt× Tax)
= ₹ 30,00,000 + (27,00,000 × 0.4)
= ₹ 40,80,000

Computation of Weighted Average Cost of Capital (WACC) of 'Cee Ltd.'

= 18% (i.e. Ke = Ko)

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of Bee Ltd

Particulars	Bee Ltd. (₹)

Net Operating Income (NOI)	9,00,000
Less: Interest on Debt (I)	3,24,000
Earnings Before Tax (EBT)	5,76,000
Less: Tax @ 40%	2,30,400
Earnings for equity shareholders (NI)	3,45,600
Total Value of Firm (V) as calculated above	40,80,000
Less: Market Value of Debt	27,00,000
Market Value of Equity (S)	13,80,000
Equity Capitalization Rate [k_e = NI/S]	0.2504
Weighted Average Cost of Capital (k_o)* $k_o = (k_e \times S/V) + (k_d \times D/V)$	13.23

*Computation of WACC Bee Ltd.

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	13,80,000	0.338	0.2504	0.0846
Debt	27,00,000	0.662	0.072*	0.0477
Total	40,80,000			0.1323

*Kd= 12% (1- 0.4) = 12% × 0.6 = 7.2% WACC = 13.23%

Q.6 MM Hypothesis | RTP Dec 21

Blue Ltd., an all equity financed company is considering the repurchase of ₹ 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is ₹ 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in futu re years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

(i) Market value of the company

(ii) Overall Cost of capital

(iii) Cost of equity

Ans. **Workings:**

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

₹ 1,750 lakhs $= \frac{\text{Net income (NI) for equity holders}}{0.20}$

Net Income to equity holders/EAT = ₹ 350 lakhs

Therefore, EBIT = $\frac{\text{EAT}}{(1-t)} = \frac{350 \text{ lakhs}}{(1-0.3)}$ = ₹ 500 lakhs

Income Statement

	All Equity (₹ In lakhs)	Equity & Debt (₹ In lakhs)
EBIT (as calculated above)	500	500
Interest on ₹ 275 lakhs @ 15%	-	41.25
EBT	-	458.75
Tax @ 30%	500	137.63
Income available to equity holders	150	321.12
	350	

(i) Market value of the company

Market value of levered firm = Value of unlevered firm + Tax Advantage
= ₹ 1,750 lakhs + (₹ 275 lakhs x 0.3)
= ₹ 1,832.5 lakhs

Change in market value of the company = ₹ 1,832.5 lakhs – ₹ 1,750 lakhs
= ₹ 82.50 lakhs

The impact is that the market value of the company has increased by ₹ 82.50 lakhs due to replacement of equity with debt.

(ii) Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased
= ₹ 1,832.50 lakhs – ₹ 275 lakhs = ₹ 1,557.50 lakhs

Cost of Equity (Ke) = (Net Income to equity holders / Market value of equity) x 100
= (₹ 321.12 lakhs / ₹ 1,557.50 lakhs) x 100
= 20.62%

Cost of debt (Kd) = I (1 - t) = 15 (1 - 0.3) = 10.50%

Components	Amount (₹ In lakhs)	Cost of Capital %	Weight	WACC (K_o) %
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or Ko has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity

The impact is that cost of equity has risen by 0.62% (20.62% - 20%) due to the presence of financial risk i.e. introduction of debt in capital structure.

Note: Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

Cost of Capital (Ko) = Keu [1 – (t x L)]

Where,

Keu = Cost of equity in an unlevered company

t = Tax rate

L = $\frac{\text{Debt}}{0.2\text{Debt} + \text{Equity}0}$

So, Ko = 0.20 + $\left[1 - \left(0.3x \frac{275 \text{ lakhs}}{1,832.5 lacks}\right)\right]$ = 0.191 or 19.10% (approx.)

Cost of Equity (Ke) = Keu + (Keu – Kd) $\frac{\text{Debt}\ (1 - t)}{\text{Equity}}$

Where,

Keu = Cost of equity in an unlevered company

Kd = Cost of debt

t = Tax rate

So, Ke = 0.20 + $(0.20 - 0.15)x \frac{275 \text{ lakhs } (1\text{-}0.3)}{1,557.5 \text{ lakhs}}$ = 0.2062 or 20.62%

Q.7 MM Hypothesis & Traditional | RTP Jul 21

Zordon Ltd. has net operating income of ₹ 5,00,000 and total capitalization of ₹ 50,00,000 during the current year. The company is contemplating to introduce debt financing in capital structure and has various options for the same. The following information is available at different levels of debt value:

Debt value (₹)	Interest rate (%)	Equity capitalization rate (%)
0	-	10.00
5,00,000	6.0	10.50
10,00,000	6.0	11.00
15,00,000	6.2	11.30
20,00,000	7.0	12.40
25,00,000	7.5	13.50
30,00,000	8.0	16.00

Assuming no tax and that the firm always maintains books at book values, you are REQUIRED to calculate:

(i) Amount of debt to be employed by firm as per traditional approach.

(ii) Equity capitalization rate, if MM approach is followed.

Ans. **(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.

$$\text{Value of a firm} = \frac{\text{Net Operating Income (NOI)}}{K0}$$

$$₹\ 50,00,000 = \frac{5,00,000}{K0}$$

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

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

Q.8 MM Hypothesis | RTP Nov 18

Rounak Ltd. is an all equity financed company with a market value of ₹ 25,00,000 and cost of equity (Ke) 21%. The company wants to buyback equity shares worth ₹ 5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to COMPUTE:

(i) Market value of J Ltd.

(ii) Cost of Equity (Ke)

(iii) Weighted average cost of capital (using market weights) and comment on it.

Ans.

Value of a company (V) = Value of equity (S) + Value of debt (D)

$$₹\ 25,00,000 = \frac{\text{Net Income (NI)}}{Ke} + ₹\ 5,00,000$$

Or, Net Income (NI) = 0.21 (₹ 25,00,000 – ₹ 5,00,000)

Market Value of Equity = ₹ 25,00,000

Ke =21%

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

$$\frac{\text{Net income (NI) for equity holders}}{0.21} = ₹\ 25,00,000$$

Net income for equity holders = ₹ 5,25,000

EBIT = 5,25,000/0.7 = ₹ 7,50,000

INTERMEDIATE (NEW) EXAMINATION: NOVEMBER, 2018

	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

= ₹ 25,00,000 + ₹ 1,50,000 = ₹ 26,50,000

(ii) Cost of Equity (Ke)

Total Value = ₹26,50,000

Less: Value of Debt = ₹5,00,000

Value of Equity = ₹21,50,000

$$Ke = \frac{4,72,500}{21,50,000} = 0.219 = 21.98\%$$

(iii) WACC (on market value weight)

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	WACC (%)
Equity	21,50,000	21.98	0.81	17.80
Debt	5,00,000	10.50	0.19	2.00

	26,50,000			19.80

Comment: At present the company is all equity financed. So, Ke = Ko i.e. 21%. However, after restructuring, the Ko would be reduced to 19.80% and Ke would increase from 21% to 21.98%.

Q.9 Net Income & Net operating | RTP May 18

Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of ₹ 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of ₹ 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company.

Required:

CALCULATE the value of companies' P and Q using

(i) Net Income Approach and

(ii) Net Operating Income Approach.

Ans. **(i) Valuation under Net Income Approach**

Particulars	P Amount (₹)	Q Amount (₹)
Earnings before Interest & Tax (EBIT) (20% of ₹ 30,00,000)	6,00,000	6,00,000
Less: Interest (10% of ₹ 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100 /15)
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

(ii) Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Capitalisation of earnings at 15% $\left(\frac{(1-0.5)}{5}\right)$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 – 0.5)}	9,00,000	Nil
Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

Q.10 Arbitrage Process | MTP May 23(2)

Following data is available in respect of two companies having same business risk: Capital employed = ₹ 12,00,000, EBIT = ₹ 2,40,000 and Ke = 15%

Sources	Dumbo Ltd (₹)	Jumbo Ltd (₹)
Debt (@12%)	4,00,000	Nil
Equity	8,00,000	12,00,000

An investor is holding 20% shares in the levered company. CALCULATE the increase in annual earnings of investor if arbitrage process is undertaken.
Also EXPLAIN the arbitrage process if Ke = 20% for Dumbo Ltd instead of 15%.

Ans. **(I). Valuation of firms**

Particulars	Dumbo Ltd (₹)	Jumbo Ltd (₹)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × ₹ 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	15%	15%
Value of Equity (S)	12,80,000	16,00,000
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	16,80,000	16,00,000

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

(II) Investment & Borrowings

	₹
Sell shares in Levered company (12,80,000 x 20%)	2,56,000
Borrow money (4,00,000 x 20%)	80,000
Buy shares in Unlevered company	3,36,000

(III) Change in Return

	₹
Income from shares in Unlevered company (2,40,000 x 3,36,000/16,00,000)	50,400
Less: Interest on loan (80,000 x 12%)	9,600
Net Income from unlevered firm	40,800
Less: Income from Levered firm (1,92,000 x 20%)	38,400
Incremental Income due to arbitrage	2,400

Arbitrage process if Ke = 20%

(I). Valuation of firms

Particulars	Dumbo Ltd (₹)	Jumbo Ltd (₹)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × ₹ 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	20%	15%
Value of Equity (S)	9,60,000	16,00,000

(Earnings available to Equity shareholders/Ke)		
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	13,80,000	16,00,000

Value of unlevered company is more than that of levered company. Therefore, investor will sell his shares in unlevered company and buy proportionate shares and debt in levered company i.e. 20% share.

(II). Investment & Borrowings

	₹
Sell shares in unlevered company (16,00,000 x 20%)	3,20,000
Buy shares in levered company (9,60,000 x 20%)	1,92,000
Buy Debt of levered company	1,28,000

(III). Change in Return

	₹
Income from shares in levered company (1,92,000 x 20%)	38,400
Add: Interest on debt of levered (1,28,000 x 12%)	15,360
Net Income from levered firm	53,760
Less: Income from unlevered firm (2,40,000 x 20%)	48,000
Incremental Income due to arbitrage	5,760

Q.11 MM Hypothesis | MTP Nov 22(1)

(a) Leo Ltd. has a net operating income of ₹ 21,60,000 and the total capitalisation of ₹ 120 lakhs. The company is evaluating the options to introduce debt financing in the capital structure and the following information is available at various levels of debt value.

Debt value (₹)	Interest rate (%)	Equity Capitalisation rate (%)
0	N.A.	12.00
10,00,000	7.00	12.50
20,00,000	7.00	13.00
30,00,000	7.50	13.50
40,00,000	7.50	14.00
50,00,000	8.00	15.00
60,00,000	8.50	16.00
70,00,000	9.00	17.00
80,00,000	10.00	20.00

You are required to COMPUTE the equity capitalization rate if MM approach is followed. Assume that the firm operates in zero tax regime and calculations to be based on book values.

(c) BRIEF OUT the remedies for Over-Capitalisation.

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

Value of a Firm = $\frac{NOI}{K0}$

$1,20,00,000 = \frac{21,60,000}{K0}$

k0

$K0 = \frac{21,60,000}{1,20,00,000} = 18\%$

Under MM approach, $ke = k + \frac{D}{E}(k0 - kd)$

Statement of equity capitalization under MM approach

Debt Value (₹)	Equity Value (₹)	Debt/ Equity	Kd (%)	Ko (%)	Ko-kd (%)	Ke = Ko+(Ko-Kd) (D/E) (%)
-	1,20,00,000	0.0000	NA	18.00	18.00	18.00
10,00,000	1,10,00,000	0.0909	7.00	18.00	11.00	19.00
20,00,000	1,00,00,000	0.2000	7.00	18.00	11.00	20.20
30,00,000	90,00,000	0.3333	7.50	18.00	10.50	21.50
40,00,000	80,00,000	0.5000	7.50	18.00	10.50	23.25
50,00,000	70,00,000	0.7143	8.00	18.00	10.00	25.14
60,00,000	60,00,000	1.0000	8.50	18.00	9.50	27.50
70,00,000	50,00,000	1.4000	9.00	18.00	9.00	30.60
80,00,000	40,00,000	2.0000	10.00	18.00	8.00	34.00

(b) Remedies for Over-Capitalisation: Following steps may be adopted to avoid the negative consequences of over-capitalisation-

(i) Company should go for thorough reorganization.
(ii) Buyback of shares.
(iii) Reduction in claims of debenture-holders and creditors.
(iv) Value of shares may also be reduced. This will result in sufficient funds for the company to carry out replacement of assets.

Q.12 MM Hypothesis | MTP May 21 (2)

Kee Ltd. and Lee Ltd. are identical in every respect except for capital structure. Kee Ltd. does not employ debt in its capital structure, whereas Lee Ltd. employs 12% debentures amounting to Rs. 20 lakhs. Assuming that:

(i) All assumptions of MM model are met;
(ii) The income tax rate is 30%;
(iii) EBIT is Rs. 5,00,000 and
(iv) The equity capitalization rate of Kee Ltd. is 25%.

CALCULATE the average value of both the Companies.

Ans. Kee Ltd. (pure Equity) i.e. unlevered company:

EAT = EBT (1 – t)

= EBIT (1 - 0.3) = Rs. 5,00,000 × 0.7 = Rs. 3,50,000

(Here, EBIT = EBT as there is no debt)

Value of unlevered company Kee Ltd. $= \frac{\text{EAT}}{\text{Equity capitalization rate}}$

$= \frac{\text{Rs.3,50,000}}{25\%}$ = Rs. 14,00,000

Lee Ltd. (Equity and Debt) i.e levered company:

Value of levered company = Value of Equity + Value of Debt

= Rs. 14,00,000 + (Rs. 20,00,000 × 0.3)

= Rs. 20,00,000

Q.13 MM Hypothesis | MTP May 20

A&R Ltd. is an all equity financed company with a market value of Rs.25,000 lakh and cost of equity (Ke) 18%. The company wants to buyback equity shares worth Rs.5,000 lakh by issuing and raising 10% debentures redeemable at 10% premium after 5 years. Rate of tax may be taken as 35%. Applying Modigliani-Miller (MM) (with taxes), you are required to CALCULATE after restructuring:

(i) Market value of A&R Ltd.

(ii) Cost of Equity (Ke)

(iii) Weighted average cost of capital (using market weights).

Ans.

Value of a company (V) = Value of equity (S) + Value of debt (D)

A&R Ltd. is all equity financed company, its value would equal to value of equity.

Market value of equity = $\frac{\text{Net Income (NI)}}{\text{Ke}}$

In the question, market value of equity is Rs.25,000 lakh and cost of equity (Ke) is 18%. The Net Income (NI) is calculated as follows:

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

$\frac{\text{Net income (NI) for equity – holders}}{0.18}$ = 25,000 lakh

Net income for equity holders = 4,500 lakh

Net Income (NI) is after tax income, the before tax income would be

EBT= $\frac{\text{4, 500 lakh}}{(1\text{-}0.35)}$ = 6,923.07 lakh.

Since, A&R Ltd. is an all equity financed and there is no interest expense, so here EBT is equal to EBIT. After issuing 10% debentures, the A&R Ltd would become a levered company.

(i) The value of A&R Ltd. after issuing debentures would be calculated as follows:

Value of a levered company (Vg)

= Value of an unlevered company (Vu) + Tax benefit (TB)

= Rs.25,000 lakh + (Rs.5,000 lakh × 35%)

= Rs.25,000 + Rs.1,750 = Rs.26,750

(ii) Cost of Equity (Ke)

Total Value = Rs.26,750 lakh

Less: Value of Debt = Rs. 5,000 lakh

Value of Equity = Rs. 21,750

$$Ke = \frac{4,175 \text{ lakh}}{21,750 \text{lakh}} = 0.1919 = 19.19\%$$

(iii) WACC (on market value weight)

Components of Costs	Amount (lakh)	Cost of Capital (%)	Weight	WACC (%)
Equity	21,750	19.19	0.81	15.54
Debt	5,000	8.10	0.19	1.54
	26,750			17.08

Workings Note:

1. **(Rs. in lakh)**

	All Equity	Debt and Equity
EBIT (as calculated above)	6,923.07	6,923.07
Interest to debt-holders	-	500.00
EBT	6,923.07	6,423.07
Taxes (35%)	2,423.07	2,248.07
Income available to equity shareholders	4,500.00	4,175.00
Income to debt holders plus income available to shareholders	4,500.00	4,675.00

2. Cost of Debenture (Kd) $= \dfrac{Rs.500(1 - 0.35) + \dfrac{(5,500 - 5,000)}{5}}{\dfrac{(5,500 + 5,000)}{2}}$

$$= \frac{Rs.325 + 100}{5,250} = 0.081 \text{ or } 8.1\%$$

Q.14 MM Hypothesis | MTP Nov 19

A Ltd. and B Ltd. are identical in every respect except capital structure. A Ltd. does not employ debts in its capital structure whereas B Ltd. employs 12% Debentures amounting to Rs.100 lakhs. Assuming that :

(i) All assumptions of M-M model are met;

(ii) Income-tax rate is 30%;

(iii) EBIT is Rs. 25,00,000 and

(iv) The Equity capitalization rate of 'A' Ltd. is 20%.

CALCULATE the value of & also find out the Weighted Average Cost of Capital for both the companies.

Ans. **(i) Calculation of Value of 'A Ltd.' and 'B Ltd' according to MM Hypothesis**

Market Value of 'A Ltd' (Unlevered)

$$Vu = \frac{EBIT\ (1 - t)}{Ke} = \frac{Rs.25,00,000\ (1 - 0.30)}{20\%} = \frac{Rs.17,\ 50,000}{20\%} = Rs.\ 87,50,000$$

Market Value of 'B Ltd.' (Levered)

Vg = Vu + TB

= Rs. 87,50,000 + (Rs.1,00,00,000 × 0.30)

= Rs. 87,50,000 + Rs.30,00,000 = Rs.1,17,50,000

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

WACC of 'A Ltd.' = 20% (i.e. Ke = Ko)

WACC of 'B Ltd.'

	B Ltd. (Rs.)
EBIT	25,00,000
Interest to Debt holders	(12,00,000)
EBT	13,00,000
Taxes @ 30%	(3,90,000)
Income available to Equity Shareholders	9,10,000
Total Value of Firm	1,17,50,000
Less: Market Value of Debt	(1,00,00,000)
Market Value of Equity	17,50,000
Return on equity (Ke) = 9,10,000 / 17,50,000	0.52

Computation of WACC B. Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	17,50,000	0.149	0.52	0.0775
Debt	1,00,00,000	0.851	0.084*	0.0715
Total	1,17,50,000			0.1490

*Kd= 12% (1- 0.3) = 12% × 0.7 = 8.4%

WACC = 14.90%

Q.15 Traditional Theory | MTP May 19(2)

The proportion and required return of debt and equity was recorded for a company with its increased financial leverage as below:

Debt (%)	Required return (Kd) (%)	Equity (%)	Required Return (Ke) (%)	Weighted Average Cost of Capital (WACC) (Ko)(%)
0	5	100	15	15
20	6	80	16	?
40	7	60	18	?
60	10	40	23	?

80	15	20	35	?

You are required to complete the table and IDENTIFY which capital structure is most beneficial for this company. (Based on traditional theory, i.e., capital structure is relevant).

Ans. Computation of Weighted Average Cost of Capital (WACC) for each level of Debt-equity mix.

Debt (%)	Required return (Kd)(%)	Equity (%)	Required return (Ke) (%)	Kd× Proportion of debt + Ke Proportion and equity	Weighted Average Cost of Capital (WACC)(Ko)(%)
0	5	100	15	0%(5%)+100%(15%)	15
2	6	80	16	20%(6%)+80%(16%)	14
4	7	60	18	40%(7%)+60%(18%)	13.6
6	10	40	23	60%(10%)+40%(23%)	15.2
8	15	20	35	80%(15%)+20%(35%)	19

The optimum mix is 40% debt and 60% equity, as this will lead to lowest WACC value i.e., 1 3.6%.

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