MAY 2025

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Question 1 :(MTP Sept 2023)

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.

Solution 1 :

Company A

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

So, 4 $= \frac{EBIT}{EBIT - ₹30,000}$

Or, 4 (EBIT – 30,000) = EBIT

Or, 3 EBIT = 1,20,000

Or, EBIT = 40,000

(ii) Operating Leverage $= \frac{Contribution}{EBIT}$ Or, $6 = \frac{Contribution}{₹40,000}$

Or Contribution = ₹ 2, 40,000

Sales $= \frac{Contribution}{P/V\ Ratio\ (1 - variable\ cost\ ratio)} = \frac{₹2,40,000}{40\%}$ = ₹ 6,00,000

(iii) Fixed Cost = Contribution – EBIT

= ₹ 2, 40,000 – 40,000

Or Fixed cost = ₹ 2,00,000

Company B

(i) Financial Leverage $= \frac{EBIT}{EBTi.e\ EBIT - Interest}$

So, 3 $= \frac{EBIT}{EBT - 1,20,000}$

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 $= \frac{Contribution}{EBIT}$

Or, 3 $= \frac{Contribution}{₹1,80,000}$

Or, Contribution = ₹ 5,40,000

Sales $= \frac{Contribution}{P/V\ Ratio\ (1 - variable\ cost\ ratio)} = \frac{₹5,40,000}{50\%}$ = ₹ 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)

Question 2 :(MTP October 2023)

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.

Solution 2 :

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	= $\frac{2.8}{13.3}$ ×100 = 21.05%	

Question 3 : (Nov 2023)

The following details of Shiva Ltd. for the year ended 31 st March,2023 are given below:

Operating Leverage	1.4
Combined Leverage	2.8
Fixed Cost (Excluding Interest)	₹ 2.04 lakhs
Sales	₹ 30 lakhs
12% Debentures of ₹ 10 each	₹ 21.25 lakhs
Equity Share Capital of ₹ 10 each	₹ 17.00 lakhs
Income Tax Rate	30%

Required:

(i) Calculate P/V ratio and Earning Per Share (EPS)
(ii) If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?
(iii) Financial Leverage

Solution 3 :

(i) P/V Ratio and Earning per share (EPS)

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

1.4 $= \frac{C}{C-2,04,000}$

Or, C = 1.4 (C – 2,04,000)

Or, C = 1.4 C – 2,85,600

Or, Contribution = ₹ 7,14,000

Now, P/V ratio $= \frac{Contribution\ (C)}{Sales\ (S)} \times 100 = \frac{7,14,000}{30,00,000} \times 100 = 23.8\%$

Therefore, P/V Ratio = 23.80%

EBT = Contribution – Fixed Cost – Interest

= ₹ 7,14,000 – ₹ 2,04,000 – (12% × ₹ 21,25,000)

= ₹ 5,10,000 – ₹ 2,55,000

= ₹ 2,55,000

PAT = EBT(1-T) = ₹ 2,55,000(1-0.3) = ₹ 1,78,500

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

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

(ii) Assets turnover

Assets turnover $= \frac{Sales}{Total\ Assets^*} = \frac{₹30,00,000}{₹17,00,000+₹21,25,000} =$ 0 .7843

0.7843 < 1.5 means lower than industry turnover.

*Total Asset = Equity share capital + 12% Debentures

(iii) Financial leverage

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

2.8 = 1.4 x FL

Or, FL = 2

Financial Leverage = 2

Question 4 : (May 2024)

Alpha Limited has provided following information:

Equity Share Capital	25,000 Shares @ ₹100 per share
15% Debentures	10,000 Debentures @ ₹750/- per Debenture
Sales	50 Lakhs units @ ₹20 per unit
Variable Cost	₹12.50 per unit
Fixed Costs	₹175.00 Lakhs

Due to recent policy changes and entry of foreign competitors in the sector, Alpha Limited expects the sales may decline by 15-20%, However, selling price and other costs will remain the same. Corporate Taxes will continue @ 20%.

You are required to calculate the decrease in Earnings per share, Degree of Operating Leverage and Financial Leverage separately if sales are declined by (i) 15% ; and (ii) 20%.

Question 5 : (MTP April 2024)

From the following PREPARE Income statement of company P and Q.

	P	Q
No. of Equity Shares	1,00,000	70,000
Financial leverage	3 : 1	4 : 1
Operating Leverage	2 : 1	3 : 1
Variable cost to sales	67%	50%
Interest	₹ 5,50,000	₹ 6,00,000
Income tax rate	30%	30%

Also CALCULATE EPS of the company.

Solution 5 :

Income statement

Particulars		P (₹)	Q (₹)
	Sales	50,00,000	48,00,000
(–)	Variable Cost	33,50,000	24,00,000
	Contribution	16,50,000	24,00,000
	Fixed Cost	8,25,000	16,00,000
	EBIT	8,25,000	8,00,000
(–)	Interest	5,50,000	6,00,000
	EBT	2,75,000	2,00,000
(–)	Tax	82,500	60,000
	EAT	1,92,500	1,40,000
(÷)	No. of Shares	1,00,000	70,000
	EPS	₹ 1.93	₹ 2.00

Working Note :

1. Financial Leverage	**=**	**EBIT / EBT**	**=**	**EBIT / (EBIT – Int.)**
Let the EBIT be X				
		P		**Q**
		3 = X/(X – 5,50,000) 3(X – 5,50,000) = X 3X – 16,50,000 = X 2X = 16,50,000		4 = X/(X – 6,00,000) 4(X – 6,00,000) = X 4X – 24,00,000 = X 3X = 24,00,000
		X = 8,25,000		**X = 8,00,000**

2. Operating Leverage = Contribution/EBIT

Let the Contribution be X

	P	**Q**
	2 = X/8,25,000	3= X/8,00,000
	X = 16,50,000	X = 24,00,000

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3. Sales

Let the Sales be 100

Sales – Variable Cost = Contribution

		P		**Q**
Contribution	=	100 – 67	=	100 – 50
=		33	=	50
Sales	=			
		P		**Q**
For 33		= 16,50,000	For 50	= 24,00,000
For 100		= **50,00,000**	For 100	= **48,00,000**

Question 6 : (RTP Sept 2024)

Following data of PC 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 (₹)		30
Variable cost per unit (₹)		20
Fixed Costs (₹):	Situation 1	3,000
	Situation 2	6,000
	Situation 3	9,000

Capital Structure:

Particulars	**Financial Plan**

	A	B
Equity	₹ 15,000	₹ 22,500
Debt	₹ 15,000	₹ 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.

Solution 6 :

(i) Operating Leverage

	Situation 1	Situation 2	Situation 3
	(₹)	(₹)	(₹)
Sales (S)			
2,400 units @ ₹ 30 per unit	72,000	72,000	72,000
Less: Variable Cost (VC) @ ₹ 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 $=\frac{C}{EBIT}$	$\frac{₹24,000}{₹21,000}$ = 1.14	$\frac{₹24,000}{₹18,000}$ = 1.33	$\frac{₹24,000}{₹15,000}$ = 1.60

Financial Leverage

	Financial Plan	
	A (₹)	B (₹)
Situation 1		
EBIT	21,000	21,000
Less: Interest on debt (₹ 15,000 x 12%); (₹ 7,500 x 12%)	1,800	900
EBT	19,200	20,100
Financial Leverage = $\frac{EBIT}{EBT}$	$\frac{₹21,000}{₹19,200}$ = 1.09	$\frac{₹21,000}{₹20,100}$ = 1.04
Situation 2		
EBIT	18,000	18,000
Less: Interest on debt	1,800	900
EBT	16,200	17,100
Financial Leverage = $\frac{EBIT}{EBT}$	$\frac{₹18,000}{₹16,200}$ = 1.11	$\frac{₹18,000}{₹17,100}$ = 1.05
Situation 3		
EBIT	15,000	15,000
Less: Interest on debt	1,800	900
EBT	13,200	14,100
Financial Leverage = $\frac{EBIT}{EBT}$	$\frac{₹15,000}{₹13,200}$ = 1.14	$\frac{₹15,000}{₹14,100}$ = 1.06

(ii) Combined Leverages

		Financial Plan	
		A (₹)	B (₹)
(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

CL = OL x FLThe 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.

Question 7 : (RTP May 2024)

From the following financial data of Company A and Company B, PREPARE their Income Statements.

	Company A (₹)	Company B (₹)

Variable Cost	88,000	50% of sales
Fixed Cost	26,500	-
Interest Expenses	14,000	11,000
Financial Leverage	5 : 1	-
Margin of Safety	-	0.25
Income Tax Rate	30%	30%
EBIT	-	14,000

Solution 7 :

Income Statements of Company A and Company B

	Company A (₹)	Company B (₹)
Sales	1,32,000	1,12,000
Less: Variable cost	88,000	56,000
Contribution	44,000	56,000
Less: Fixed Cost	26,500	42,000
Earnings before interest and tax (EBIT)	17,500	14,000
Less: Interest	14,000	11,000
Earnings before tax (EBT)	3,500	3,000
Less: Tax @ 30%	1,050	900
Earnings after tax (EAT)	2,450	2,100

Working Notes:

Company A

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

So, 5 = $\frac{EBIT}{EBIT - 14{,}000}$ EBIT

Or, 5 (EBIT – 14,000) = EBIT

Or, 4 EBIT = 70,000

Or, EBIT = ₹17,500

(ii) Contribution = EBIT + Fixed Cost

= ₹ 17,500 + ₹ 26,500 = ₹ 44,000

(iii) Sales = Contribution + Variable cost

= ₹ 44,000 + ₹ 88,000

= ₹ 1,32,000

Company B

(i) Operating Leverage =1/Margin of Safety = $\frac{Contribution}{EBIT}$

1/0.25 = $\frac{Contribution}{₹14{,}000}$

4 = $\frac{Contribution}{₹14{,}000}$

Contribution = ₹14,000 x 4 = ₹56,000

(ii) Fixed Cost = Contribution – EBIT = 56,000 – 14,000 = ₹ 42,000

(iii) Contribution = 50% of Sales (as Variable Cost is 50% of Sales)

Sales = 56,000 x 2 = ₹1,12,000

Question 8 :(RTP Nov 2023)

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.

Solution 8:

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 = $\frac{Contribution}{EBIT}$	$=\frac{6,00,000}{4,00,000} = 1.50$	$=\frac{5,00,000}{3,00,000} = 1.67$
(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%	

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Question 1 : (MTP Sept 2023)

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.

Solution 1 :

Working notes:

(i) Computation of Current Assets and Current Liabilities

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

Liquid ratio = $\frac{Liquid\ assets}{Current\ Liabilities}$

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

1.5 x ₹ 3, 60,000 = ₹ 9,00,000 - Inventories

Inventories =₹ 9,00,000 – ₹ 5,40,000 = ₹ 3,60,000

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

Fixed Asset to Proprietary ratio = $\frac{Fixed\ assets}{Proprietary\ funds}$ = 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 ´ ₹ 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

Question 2 : (MTP October 2023)

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.

Solution 2 :

(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 = $\frac{Cost\ of\ Goods\ sold}{Average\ inventory}$

3 = $\frac{9,60,000}{Average\ inventory}$

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

(ii) Calculation of Average Collection Period

Average Collection Period = $\frac{Average\ Receivables}{Credit\ Sales}$ x 360

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

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**

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

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

Question 3 :(MTP March 2024)

ANVY Ltd. has furnished the following ratios and information for the year end 31st March, 2023:

Equity share capital	₹ 2,00,000
The relevant ratios of the company are as follows:	
Current debt to total debt	0.50
Total debt to Equity share capital	0.60
Fixed assets to Equity share capital	0.70
Total assets turnover	2.5 Times
Inventory turnover	10 Times

You are required to PREPARE the Balance Sheet of ANVY Ltd. as on 31st March, 2023.

Solution 3 :

ANVY Ltd

Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
Equity share capital	2,00,000	Fixed assets	1,40,000
Current debt	60,000	Cash (balancing figure)	1,00,000
Long term debt	60,000	Inventory	80,000
	3,20,000		3,20,000

Working Notes

1. Total debt = 0.60 x Equity share capital = 0.60 x ₹ 2,00,000 = ₹ 1,20,000
   Further, Current debt to total debt = 0.50.
   So, current debt = 0.50 x ₹1,20,000 = ₹ 60,000,
   Long term debt = ₹1,20,000 - ₹60,000= ₹ 60,000
2. Fixed assets = 0.70 × Equity share Capital = 0.70 × ₹ 2,00,000 = ₹ 1,40,000
3. Total assets to turnover = 2.5 Times: Inventory turnover = 10 Times Hence, Inventory /Total assets = 2.5/10=1/4, Total assets = ₹ 3,20,000 Therefore Inventory = ₹ 3,20,000/4 = ₹ 80,000

Question 4 : (Nov 2023)

You are available with following information of Brave Ltd:

Debtor's velocity	3 months
Stock velocity	6 months
Creditor's velocity	2 months
Gross profit ratio	20%

The gross profit for the year ended 31st March,2023 was ₹ 10,00,000. Stock for the same period was ₹ 40,000 more than what it was at the beginning of the year. Bills receivable were ₹ 1,20,000.

Form the above information you are required to calculate:

(i) Sales
(ii) Sundry debtors
(iii) Closing stock

Solution 4 :

(i) Determination of Sales:

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

Or, $\frac{20}{100} = \frac{₹10,00,000}{Sales}$

Or, Sales $= \frac{10,00,00,000}{20} = ₹50,00,000$

Cost of Goods Sold = Sales – Gross Profit

= ₹ 50,00,000 - ₹ 10,00,000 = ₹ 40,00,000

(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 $= \frac{Credit\ Sales}{Average\ Accounts\ Receivable}$

$= \frac{₹50,00,000}{Bills\ Receivables + Sundry\ Debtors} = 4$

Or, Sundry Debtors + Bills receivable = ₹ 12,50,000

Sundry Debtors = ₹ 12,50,000 – ₹ 1,20,000 = ₹ 11,30,000

(iii) Determination of Closing Stock

Stock velocity is 6 months so Stock Turnover Ratio=2

Stock Turnover Ratio $= \frac{Cost\ of\ Goods\ Sold}{Average\ Stock} = \frac{₹40,00,000}{Average\ Stock} = 2$

So, Average Stock = ₹ 20,00,000

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

Or $\frac{Opening\ stock + (operating\ stock + ₹40,000)}{2} = ₹\ 20,00,000$

Or, Opening Stock + ₹ 20,000 = ₹ 20,00,000

Or, Opening Stock = ₹ 19,80,000

So, Closing Stock = ₹ 19,80,000 + ₹ 40,000 = ₹ 20,20,000

Question 5 : (May 2024)

Theme Ltd provides you the following information:

12.5% Debt	₹45,00,000
Debt to Equity Ratio	1.5 : 1
Return on shareholder's fund	54%
Operating Ratio	85%
Ratio of operating expenses to Cost of Goods sold	2 : 6
Tax Rate	25%
Fixed Assets	₹ 39,00,000
Current Ratio	1.8 : 1

You are required to calculate:

(i) Interest Coverage Ratio
(ii) Gross Profit Ratio
(iii) Current Assets

Answer 5 :

(a) Working Notes:

Debt = ` 45,00,000
Interest = ` 45,00,000 x 12.5%= 5,62,500
Debt to Equity = 1.5:1 = $\frac{Total\ Debt}{Shareholder's\ Equity}$
Equity = ` 30,00,000
Return of Shareholder's funds = 54% = $\frac{Net\ Profit\ after\ taxes}{Equity\ shareholder's\ fund}$ ×100
Profit after tax (PAT) = 54% x Equity = `16,20,000
Profit before tax (PBT)(1-25%) = Profit after tax
= `16,20,000/75% = `21,60,000
Earning before interest and tax (EBIT) = PBT + Interest
= `21,60,000 + ` 5,62,500
= `27,22,500

(i) Interest Coverage Ratio = EBIT/Interest
= `27,22,500/`5,62,500
= 4.84 Times

(ii) Operating Profit Ratio = 1 - Operating Ratio
= 1 – 0.85 = 0.15 or 15%

0.15 = $\frac{Operating\ Profit}{Sales}$×100
Sales = EBIT or Operating Profit /0.15
= ` 27,22,500 / 0.15
= ` 1,81,50,000

Operating ratio = $\frac{Operating\ expenses}{Cost\ of\ goods\ sold\ (COGS)}$ = 2:6 = 1:3
Operating expenses = 1/3COGS
Operating cost = Sales – Operating profit
= ` 1,81,50,000 - ` 27,22,500
= ` 1,54,27,500
` 1,54,27,500 = COGS + Operating expenses
` 1,54,27,500 = COGS + 1/3COGS
COGS = ` 1,15,70,625
Gross profit = Sales – COGS
= 1,81,50,000 – 1,15,70,625
= ` 65,79,375

Gross Profit ratio = $\frac{Gross\ Profit}{Sales}$×100
= 65,79,375/1,81,50,000
= 0.3625 or 36.25%

Gross profit and sales can be calculated in alternative way also. However, there will be no change in GP ratio i.e 36.25%

(iii) Current Ratio = $\frac{Current\ Assets}{Current\ liabilities}$
= 1.8
Current Assets = 1.8 Current Liabilities
Total of Balance sheet liability = Equity + Debt + Current Liabilities
=30,00,000+45,00,000+CL..... (2)
Total Balance sheet asset = Fixed Assets + Current Assets
= 39 lakhs + CA= 39 + 1.8CL..... (3)

Equating 2 and 3,
75,00,000 + CL = 39,00,000 + 1.8CL
0.8CL = 36,00,000
CL =` 45,00,000
Current Assets = 1.8 CL = 1.8 x 45 lakhs= ` **81,00,000**

Question 6 : (MTP April 2024)

EOC Ltd is a listed company and has presented the abridged financial statements below.

Statement of Profit and Loss	**₹**	**₹**
Sales		1,25,00,000
Cost of goods sold		(76,40,000)
Gross Profit		48,60,000

Less: Operating Expenses		
Administrative Expenses	13,20,000	
Selling and Distribution Expenses	15,90,000	(29,10,000)
Operating Profit		19,50,000
Add: Non Operating Income		3,28,000
Less: Non Operating Expenses		(1,27,000)
Profit before Interest and taxes		21,51,000
Less: Interest		(4,39,000)
Profit before tax		17,12,000
Less: Taxes		(4,28,000)
Profit after Tax		12,84,000

Balance Sheet

Sources of Funds	₹	₹
Owned Funds		
Equity Share Capital	30,00,000	
Reserves and Surplus	18,00,000	48,00,000
Borrowed Funds		
Secured Loan	10,00,000	
Unsecured Loan	4,30,000	14,30,000
Total Funds Raised		62,30,000
Application of Funds		
Non-Current Assets		
Building	7,50,000	
Machinery	2,30,000	
Furniture	7,60,000	
Intangible Assets	50,000	17,90,000
Current Assets		
Inventory	38,60,000	
Receivables	39,97,000	
ST investments	3,00,000	
Cash and Bank	2,30,000	83,87,000
Less: Current Liabilities		
Creditors	25,67,000	
ST loans	13,80,000	(39,47,000)
Total Funds Employed		62,30,000

The company has set certain standards for the upcoming year financial status.
All the ratios are based on closing figures in financial statements.

Equity SC to Reserves=	1	
Net Profit Ratio=	15%	
Gross Profit Ratio=	50%	
Long Term Debt to Equity=	0.5	
Debtor Turnover=	100	Days
Creditor Turnover (based on COGS)=	100	Days
Inventory=	70%	of Opening inventory

Cash Balance is assumed to remain same for next year You are required to -
(1) CALCULATE inventory turnover ratio in days for current year
(2) CALCULATE receivables turnover ratio in days for current year
(3) CALCULATE the projected receivables, inventory, payables and long term debt

Solution 6 :

- Inventory Turnover = $\frac{Inventory}{COGS} \times 365 = \frac{38,60,000 \times 365}{76,40,000}$ = 184.41 days = 185 days (apx)
- Receivables Turnover = $\frac{Receivables}{Sales} \times 365 = \frac{39,97,000 \times 365}{1,25,00,000}$ = 116.71 = 117 days (apx)

- Equity to Reserves = 1
- Reserves = 1 x 30,00,000 = 30,00,000
- Projected profit = 30,00,000 - 18,00,000 = 12,00,000
- Net Profit Margin = 15%, 12,00,000/ Sales = 0.15 Sales = 80,00,000
- Gross Profit = 80,00,000 x 50% = 40,00,000
- COGS = 80,00,000 - 40,00,000 = 40,00,000
- Projected Debtors Turnover = 100 days = $\frac{Closing\ Receivables}{Sales}$ x 365, 100 = $\frac{Closing\ Receivables}{80,00,000}$ x 365
- Closing Receivables = $\frac{80,00,000\ x\ 100}{365}$ = 21,91,781
- Projected Closing Inventory = 70% of opening inventory = 70% of 38,60,000 = 27,02,000
- Projected Creditor Turnover= 100 days = $\frac{Closing\ Creditors}{COGS}$ x365, Closing Creditors = $\frac{COGS}{365}$ x100
- Closing Creditor = $\frac{40,00,000}{365}$ x100 = 10,95,890
- Equity Share Capital + Reserves = 30,00,000 + 30,00,000 = 60,00,000
- Long Term Debt to Equity = 0.5, $\frac{LTD}{60,00,000}$ = 0.5
- Long Term Debt = 0.5 x 60,00,000
- Long Term Debt = 30,00,000

Question 7 : (RTP Sept 2024)

Following are the data in respect of LP enterprises for the year ended 31st March, 2024:

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	: 60 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 LP enterprises as on 31st March, 2024. All calculations should be in nearest Rupee. Assume 360 days in a year.

Solution 7 :

Working Notes:

(1) Total Liability = Total Assets = ₹50,00,000

Debt to Total Asset Ratio = 0.40

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

$\frac{Debt}{50,00,000}$ = 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 and Surplus= ₹10,00,000

(3) $\frac{Long\ term\ Debt}{Equity\ Shareholder's\ Fund}$ = 30%

$\frac{Long\ term\ Debt}{(20,00,000+10,00,000)}$ = 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 = $\frac{100}{80} \times 64,00,000$ = 80,00,000

(6) Inventory turnover = $\frac{360}{60}$

$\frac{COGS}{Closing\ Inventory}$ = $\frac{360}{60}$

$\frac{64,00,000}{Closing\ Inventory}$ = $\frac{360}{60}$

Closing Inventory = 10,66,667

(7) Accounts Receivable period = 36 days

$\frac{Accounts\ Receivable}{Credit\ Sales} \times 360$ = 36

Accounts Receivable = $\frac{36}{360} \times Credit\ Sales$

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

Accounts Receivable = ₹8,00,000

(8) Quick Ratio = 0.9

$\frac{Quick\ Ratio}{Current\ liabilities}$ = 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 - (10,66,667+8,00,000+1,90,000)
= 29,43,333

Balance Sheet of LP enterprises as on 31st March 2024

Liabilities	(₹)	Assets	(₹)
Share Capital	20,00,000	Fixed Assets	29,43,333
Reserved surplus	10,00,000	Current Assets:	
Long Term Debt	9,00,000	Inventory	10,66,667
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')

Question 8 : (RTP May 2024)

From the following information and ratios, PREPARE the Balance Sheet as on 31st March 2023 and Income Statement for the year ended on that date for Limelite & Co.

Gross Profit	₹ 1,20,000
Shareholders' Funds	₹ 5,00,000
Gross Profit margin	40%
Net Profit Margin	10%
PBIT to PBT	2:1
Credit sales to Total sales	80%
Total Assets turnover	0.4 times
Inventory turnover (Use sales as turnover)	5 times
Average collection period (a 360 days year)	30 days
Current ratio	2
Operating expenses (excluding interest)	₹ 60,000
Long-term Debt to Equity	40%
Tax	Nil

Solution 8 :

Gross Profit = ₹ 1,20,000

Gross Profit Margin = 40%

Sales = $\frac{Gross\ Profit}{Gross\ Profit\ Margin}$ = = ₹ 1,20,000 / 0.40 = ₹ 3,00,000

Net profit (PBT) = 3,00,000 x 10% = ₹ 30,000

PBIT/PBT = 2
PBIT = 2 x 30,000
PBIT = 60,000
Interest = 60,000 – 30,000 = ₹ 30,000
Credit Sales to Total Sales = 80%
Credit Sales = ₹ 3,00,000×0.80 = ₹ 2,40,000
Total Assets Turnover = 0.4 times
Total Assets = $\frac{Sales}{Total\ Assets\ Turnover}$ = $\frac{₹\ 3,00,000}{0.4}$ = ₹ 7,50,000
Inventory turnover = 5 times
Inventory = $\frac{Sales}{Inventory\ Turnover}$ = $\frac{3,00,000}{5}$ = ₹ 60,000
Average Collection Period = 30 days
Debtors turnover = $\frac{360}{Average\ Collection\ Period}$ = 360/30 = 12
Debtors = $\frac{Credit\ Sales}{Debtors\ turnover}$ = $\frac{₹\ 2,40,000}{12}$ = = ₹ 20,000
Current ratio = 2
2 = $\frac{Debtors + Inventory + Cash\ (Current\ Assets)}{Creditors\ (Current\ Liabilities)}$
2 Creditors = (₹ 20,000 + ₹ 60,000 + Cash)
2 Creditors = ₹ 80,000 + Cash ..... (i)
Long-term Debt to Equity = 40%
Shareholders' Funds (Equity) = ₹ 5,00,000
Long-term Debt = ₹ 5,00,000 × 40% = ₹ 2,00,000

Creditors = Total Assets – (Shareholder's fund + Long term debt)
= ₹ 7,50,000 – (5,00,000 + 2,00,000) = ₹ 50,000
Cash = (₹ 50,000×2) – ₹ 80,000 = ₹ 20,000 [From equation (i)]

Income Statement

	(₹)
Sales	3,00,000
Less: Cost of Goods Sold	1,80,000
Gross Profit	1,20,000
Less: Operating Expenses	60,000
PBIT	60,000
Less: Interest	30,000
Net Profit	**30,000**

Balance Sheet

Liabilities	₹	Assets		₹
Equity share capital	5,00,000	Fixed asset (bal. fig.)		6,50,000
Long term debt	2,00,000	Current assets:		
Current liability	50,000	Stock	60,000	
		Receivables	20,000	
		Cash	20,000	1,00,000
	7,50,000			**7,50,000**

Question 9 :(RTP Nov 2023)
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

Solution 9 :

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.

Question 10 :(MTP AUG 2024)
EPL Ltd. has furnished the following information relating to the year ended 31st March 2023 and 31st March, 2024:

	31st March, 2023	31st March, 2024
Share Capital	50,00,000	50,00,000
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 1½ 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 2024 in following format:

Liabilities	(₹)	Assets	(₹)
Share Capital	-	Fixed Assets	-
Reserve and Surplus	-	Sundry Debtors	-
Long-term loan	-	Closing Stock	-
Sundry Creditors	-	Cash in hand	-

Solution 10 :
Change in Reserve & Surplus = ₹ 25, 00,000 – ₹ 20,00,000 = ₹ 5,00,000
So, Net profit = ₹ 5, 00,000
(i) Net Profit Ratio = 8%
∴ Sales = ₹5,00,000

(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 $= \frac{Cost\ of\ Goods\ Sold}{STR} = \frac{50,00,000}{4} = ₹12,50,000$

(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 2024

Liabilities	**(₹)**	**Assets**	**(₹)**
Share Capital	50,00,000	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)	4,37,500	Cash in hand	6,25,000
	1,09,37,500		1,09,37,500

CA NITIN GURU

Question 1 : (MTP Sept 2023)

ABC Company's equity share is quoted in the market at ₹ 30 per share currently. The company pays a dividend of ₹ 3 per share and the investor's market expects a growth rate of 7% per year.

You are required to:

(i) CALCULATE the company's cost of equity capital.

(ii) If the company issues 10% debentures of face value of ₹ 100 each and realises ₹ 95 per debenture while the debentures are redeemable after 10 years at a premium of 10%, CALCULATE cost of debenture using YTM?

Assume Tax Rate to be 50%.

Solution 1 :

(i) Cost of Equity Capital (Ke):

$$Ke=\frac{Expected\ dividend\ per\ share\ (D1)}{Market\ price\ per\ share\ (Po)}+Growth\ rate\ (g)=\frac{₹3\times1.07}{₹30}+0.07=0.177 \text{ or } 17.7\%$$

(ii) Cost of Debenture (Kd):

Using Present Value method (YTM)

Identification of relevant cash flows

Year	Cash flows
0	Current market price (P0) = ₹ 95
1 to 10	Interest net of tax [I(1-t)] = 10% of ₹ 100 (1 – 0.5) = ₹ 5
10	Redemption value (RV) = ₹ 100 (1.10) = ₹ 110

Calculation of Net Present Values (NPV) at two discount rates

Year	Cash flows (₹)	Discount factor @ 5% (L)	Present Value (₹)	Discount factor @ 10% (H)	Present Value (₹)
0	(95)	1.000	(95.00)	1.000	(95.00)
1 to 10	5	7.722	38.61	6.145	30.725
10	110	0.614	67.54	0.386	42.46
NPV			+11.15		-21.815

Calculation of IRR

$$IRR=L+\frac{NPV_L}{NPV_L-NPV_H}(H-L)$$

$$=5\%+\frac{₹11.15}{₹11.15-(₹-21.815)}(10\%-5\%)=5\%+\frac{₹55.75}{₹32.965}=6.69\%$$

Therefore, $K_d = 6.69\%$

Question 2 : (MTP October 2023)

Q Ltd. has the following capital structure at book-value as on 31st March 2022:

Particulars	(₹)
Equity share capital (10,00,000 shares)	4,00,00,000
12% Preference shares	80,00,000
11% Debentures	2,00,00,000
	6,80,00,000

The equity shares of the company are sold for ₹ 400. It is expected that the company will pay next year a dividend of ₹ 20 per equity share, which is expected to grow by 5% p.a. forever. Assume a 30% corporate tax rate.

Required:

(i) COMPUTE weighted average cost of capital (WACC) of the company based on the existing capital structure.

(ii) COMPUTE the new WACC, if the company raises an additional ₹ 50 lakhs debt by issuing 12% debentures. This would result in increasing the expected equity dividend to ₹ 25 and leave the growth rate unchanged, but the price of equity share will fall to ₹ 300 per share. [10 Marks]

Solution 2 :

(i) Computation of Weighted Average Cost of Capital based on existing capital structure

Source of Capital	Existing Capital structure (₹)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) × (b)
Equity share capital (W.N.1)	4,00,00,000	0.588	10.00	5.88
12% Preference share capital	80,00,000	0.118	12.00	1.42

11% Debentures (W.N.2)	2,00,00,000	0.294	7.70	2.26
Total	6,80,00,000	1.000		9.56

Working Notes:

1. Cost of Equity Capital:

Ke = $\frac{Expected\ dividend\ (D1)}{Current\ Market\ Price\ (Po)} + Growth\ (g)$

= $\frac{20}{400} + 0.05$

= 10%

2. Cost of 10% Debentures

Kd = $\frac{Interest(1-t)}{Net\ proceeds}$

= $\frac{22,00,000(1-0.30)}{2,00,00,000}$

= 0.077 or 7.7%

(ii) Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure (₹)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) x (b)
Equity share capital (W.N.3)	4,00,00,000	0.548	13.33	7.30
12% Preference share capital	80,00,000	0.110	12.00	1.32
11% Debentures (W.N.2)	2,00,00,000	0.274	7.70	2.11
12% Debentures (W.N.4)	50,00,000	0.068	8.40	0.57
Total	7,30,00,000	1.000		11.30

Working Notes:

3. Cost of Equity Capital:

Ke = $\frac{25}{300}$ + 0.05

= 13.33%

4. Cost of 12% Debentures

Kd = $\frac{6,00,000(1-0.30)}{50,00,000}$

= 0.084 or 8.4%

Question 3 : (MTP March 2024)

Ram Ltd evaluates all its capital projects using a discounting rate of 16%. Its capital structure consists of equity share capital, retained earnings, bank term loan and debentures redeemable at par. Rate of interest on bank term loan is 1.4 times that of debenture. Remaining tenure of debenture and bank loan is 4 years and 6 years respectively. Book value of equity share capital, retained earnings and bank loan is ₹ 20,00,000, ₹ 30,00,000 and ₹ 20,00,000 respectively. Debentures which are having book value of ₹ 30,00,000 are currently trading at ₹ 98 per debenture. The ongoing PE multiple for the shares of the company stands at 4.

You are required to:

(i) CALCULATE the rate of interest on bank loan and

(ii) CALCULATE the rate of interest on debentures

Tax rate applicable is 30%.

Solution 3 :

Working Note:

Let the rate of Interest on debenture be x

Rate of Interest on loan = 1.4x

kd on debentures = $\frac{Int\ (1-t) + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} = \frac{100 \times (1-0.30) + \frac{100-98}{4}}{\frac{100+98}{2}} = \frac{70x + 0.5}{99}$

Kd on bank loan = 1.4 x (1 – 0.30) = 0.98x

Ke = $\frac{EPS}{MPS} = \frac{1}{MPS/EPS} = \frac{1}{PE} = \frac{1}{4}$ = 0.25 , Ke = 0.25

Computation of WACC

Capital	Amount	Weights	Cost	Product
Equity	20,00,000	0.2	0.25	0.05
Reserves	30,00,000	0.3	0.25	0.075
Debentures	30,00,000	0.3	(70x+0.5)/99	(21x+0.15)/99

Bank Loan	20,00,000	0.2	0.98x	0.196x
	1,00,00,000	1		0.125+0.196x + $\frac{21x + 0.15}{99}$

WACC = 16%

0.125+0.196x+ $\frac{21x + 0.15}{99}$ = 0.16

12.375+19.404x+21x+0.15 = (0.16)(99)

40.404x = 15.84 – 12.525

40.404x = 3.315

x = $\frac{3.315}{40.404}$, x = 8.20%

(i) Rate of interest on debenture = x = 8.20%

(ii) Rate of interest on Bank loan = 1.4x = (1.4)(8.20%) = 11.48%.

(b) In the dividend price approach, cost of equity capital is computed by dividing the expected dividend by market price per share. This ratio expresses the cost of equity capital in relation to what yield the company should pay to attract investors. It is computed as:

$K_e = \frac{D_1}{P_o}$

Where,

K_e = Cost of equity

D = Expected dividend (also written as D1)

P_o = Market price of equity (ex- dividend)

Question 4 : (Nov 2023)

Z Ltd. wishes to raise additional fund of ₹ 25,00,000 for meeting its investment plan. It has ₹ 5,25,000 in the form of retained earnings available for investment purposes. Further details are as following:

Combination of debt and equity	2:3
Cost of debt	
Upto ₹ 2,50,000	8% (before tax)
Above ₹ 2,50,000 and to upto ₹ 5,00,000	10% (before tax)
Beyond ₹ 5,00,000	12% (after tax)
Earning of company	₹ 50,00,000
Retention Ratio	40%
Expected growth of dividend	15%
Market price per share	₹ 500
Number of outstanding equity shares	1,00,000
Tax Rate	30%

You are required to calculate:

i. Cost of debt

ii. Cost of retained earnings and cost of equity

iii. Weighted average cost of capital

Solution 4 :

Equity 60% of ₹ 25,00,000 = ₹ 15,00,000

Debt 40% of ₹ 25,00,000 = ₹ 10,00,000

The capital structure after raising additional finance:

		(₹)
Shareholders' funds		
Equity Capital	(₹ 15,00,000 –₹5,25,000)	9,75,000
Retained earnings		5,25,000
Debt (Interest at 8% p.a.)		2,50,000
(Interest at 10% p.a.)	(₹ 5,00,000 – ₹ 2,50,000)	2,50,000
(Interest at 12% p.a.)	(₹ 10,00,000 – ₹ 5,00,000)	5,00,000
Total Funds		25,00,000

(i) Determination of post-tax average cost of additional debt:

Kd = I (1 – t)
Where,
I = Interest Rate
t = tax-rate
On ₹ 2,50,000 = 8% (1 – 0.3) = 5.6% or 0.056
On ₹ 2,50,000 = 10% (1 – 0.3) = 7% or 0.07
On ₹ 5,00,000 = 12% or 0.12

Average Cost of Debt

$= \frac{(₹2,50,000\times0.056)+(₹2,50,000\times0.07)+(₹5,00,000\times0.12)}{₹10,00,000}\times100 = 9.15\%$

(ii) Determination of cost of retained earnings and cost of equity by applying Dividend growth model:

Ke or Kr = $\frac{D1}{Po} + g = \frac{Do(1+g)}{Po} + g$

Where,
D0 = Dividend paid = 60% of EPS = 60% × ₹ 50 = ₹ 30
g = Growth rate = 15%
P0 = Current market price per share = ₹ 500

So, **Ke or Kr** = $\frac{₹30(1+0.15)}{₹500}$ + 0.15 = 0.069 + 0.15 = 21.9%

(iii) Computation of overall weighted average after tax cost of additional finance:

Particulars	(₹)	Weights	Cost of funds	Weighted Cost (%)
Equity (including retained earnings)	15,00,000	0.60	21.9%	13.14
Debt	10,00,000	0.40	9.15%	3.66
WACC	25,00,000			**16.80**

Alternative Presentation

Particulars (1)	(₹) (2)	Cost of funds (3)	Product (2) x (3)
Equity (including retained earnings)	15,00,000	21.9%	3,28,500
Debt	10,00,000	9.15%	91,500
Total	25,00,000		4,20,000

WACC = (Product / Total book value) x 100 = (4,20,000 / 25,00,000) x 100 = **16.8%**

Alternative Solution for 4(ii) and 4(iii)

If we assume expected growth rate of Dividend as 5%.

(i) Determination of cost of retained earnings and cost of equity by applying Dividend growth model:

Ke or Kr = $\frac{D1}{Po} + g = \frac{Do(1+g)}{Po} + g$

Where,
D0 = Dividend paid = 60% of EPS = 60% × ₹ 50 = ₹ 30
g = Growth rate = 5%
P0 = Current market price per share = ₹ 500

So, **Ke or Kr** = $\frac{₹30(1+0.05)}{₹500}$ + 0.05 = 0.063 + 0.05 = 11.3%

(ii) Computation of overall weighted average after tax cost of additional finance:

Particulars	(₹)	Weights	Cost of funds	Weighted Cost (%)
Equity (including retained earnings)	15,00,000	0.60	11.3%	6.78
Debt	10,00,000	0.40	9.15%	3.66
WACC	25,00,000			**10.44**

Alternative Presentation

Particulars (1)	(₹) (2)	Cost of funds (3)	(2) x (3)
Equity (including retained earnings)	15,00,000	11.3%	1,69,500
Debt	10,00,000	9.15%	91,500
Total	25,00,000		2,61,000

WACC = (Product / Total book value) x 100 = (2,61,000 / 25,00,000) x 100 = **10.44%**

Question 5 : (May 2024)

The capital structure of Shine Ltd. as on 31.03.2024 is as under:

Particulars	Amount (₹)
Equity share capital of ₹10 each	45,00,000
15% Preference share capital of ₹100 each	36,00,000
Retained earnings	32,00,000
13% convertible debenture of ₹100 each	67,00,000
11% Term Loan	20,00,000
Total	**2,00,00,000**

Additional information:

(A) Company issued 13% Convertible Debentures of ₹100 each on 01.04.2023 with a maturity period of 6 years. At maturity , the debenture holders will have an option to convert the debentures into equity shares of the company in the ratio of 1:4 (4 shares for each debenture). The market price of the equity share is ₹25 each as on 31.03.2024 and the growth rate of the share is 6% per annum.

(B) Preference stock, redeemable after eight years, is currently selling at ₹150 per share.

(C) The prevailing default-risk free interest rate on 10-year GOI treasury bonds is 6%. The average market risk premium is 8% and the Beta (β) of the company is 1.54.

Corporate tax rate is 25% and rate of personal income tax is 20%.

You are required to calculate the cost of:

(i) Equity Share Capital

(ii) Preference Share Capital

(iii) Convertible Debenture

(iv) Retained Earnings

(v) Term Loan

Question 6 : (RTP Sept 2024)

BS Ltd. has the following capital structure at book-value as on 31st March, 2024:

Particulars	(₹)
Equity share capital (10,00,000 shares)	3,00,00,000
11.5% Preference shares	60,00,000
10% Debentures	1,00,00,000
	4,60,00,000

The equity shares of the company are sold for ₹ 300. It is expected that the company will pay next year a dividend of ₹ 15 per equity share, which is expected to grow by 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

(i) COMPUTE weighted average cost of capital (WACC) of the company based on the existing capital structure.

(ii) COMPUTE the new WACC, if the company raises an additional ₹ 50 lakhs debt by issuing 10 years 12% debentures but the yield on debentures of similar maturity and risk class is 13%; flotation cost is 2%. Face value of the debenture is ₹100. This would result in increasing the expected equity dividend to ₹ 20 and leave the growth rate unchanged, but the price of equity share will fall to ₹ 250 per share.

Solution 6 :

(i) Computation of Weighted Average Cost of Capital based on existing capital structure

Source of Capital	Existing Capital structure (₹)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) × (b)
Equity share capital (W.N.1)	3,00,00,000	0.652	10.00	6.52
11.5% Preference share capital	60,00,000	0.130	11.50	1.50
10% Debentures (W.N.2)	1,00,00,000	0.218	6.50	1.42
Total	4,60,00,000	1.000		9.44

Working Notes:

1. Cost of Equity Capital:

Ke $= \frac{Expected\ Dividend\ (D1)}{Current\ Market\ Price\ (Po)} + Growth(g)$

$= \frac{₹15}{₹300} + 0.05$

= 10%

2. Cost of 10% Debentures

Kd $= \frac{Interest(1-t)}{Net\ Proceeds}$

$= \frac{₹10,00,000(1-0.35)}{₹1,00,00,000}$

= 0.065 or 6.5%

(ii) Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure (₹)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) x (b)
Equity share capital (W.N.3)	3,00,00,000	0.588	13.00	7.64
11.5% Preference share capital	60,00,000	0.118	11.50	1.36
10% Debentures (W.N.2)	1,00,00,000	0.196	6.50	1.27
12% Debentures (W.N.4)	50,00,000	0.098	9.21	0.90
Total	5,10,00,000	1.000		11.17

Working Notes:

3. Cost of Equity Capital:

$K_e = \frac{₹20}{₹250} + 0.05$

= 13%

4. Cost of 12% Debentures

Kd $= \frac{I(1-t)+\left(\frac{RV-NP}{n}\right)}{\frac{RV+NP}{2}}$

$= \frac{₹12(1-0.35)+\left(\frac{₹100-₹90.31^*}{10\ years}\right)}{\frac{₹100+₹90.31^*}{2}}$

$= \frac{₹8.769}{₹95.155} = 0.0921$

*Since yield on similar type of debentures is 13 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

= ₹ 12 ÷ 0.13 = ₹ 92.31

Sale proceeds from debentures = ₹ 92.31 – ₹ 2 (i.e., floatation cost) = ₹ 90.31

Question 7 :(RTP May 2024)

Totto Ltd. has following capital structure as on 31st December 2023, which is considered to be optimum:

	(₹)
12% Debenture	4,50,000
10% Preference share capital	1,50,000
Equity shares capital (2,00,000 shares)	24,00,000

The company's share has a current market price of ₹ 30.25 per share. The expected dividend per share in next year is 50 percent of the 2023 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue:

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EPS (₹)	1.180	1.311	1.456	1.616	1.794	1.99	2.209	2.452	2.723	3.023

The company can issue 14 percent new debenture and 12 percent new preference share. The company's debenture is currently selling at ₹ 99.

The new preference issue can be sold at a net price of ₹ 9.90, paying a dividend of ₹ 1.25 per share. The company's marginal tax rate is 50%.

(i) CALCULATE the after-tax cost (a) of new debts and new preference share capital, (b) of ordinary equity, assuming new equity comes from retained earnings.

(ii) CALCULATE the marginal cost of capital for the new funds raised.
(iii) How much can be spent for capital investment before new ordinary share must be sold? Marginal cost of capital remains to be constant. (Assuming that retained earnings available for next year's investment is 50% of 2023 earnings.)
(iv) What will be the marginal cost of capital (cost of fund raised in excess of the amount calculated in part (iii) if the company can sell new ordinary shares of ₹ 22 per share? Assuming both the cost of debt and of preference share capital to be constant.

Solution 7 :

(i) Calculation of after-tax cost of the followings:

(a) New 14% Debentures (K_d) $= \frac{I(1-t)}{NP} = \frac{₹\,14(1-0.5)}{₹\,99}$ = 0.0707 or 7.07%

New 12% Preference Shares (K_p) $= \frac{PD}{NP} = \frac{₹\,1.25}{₹\,9.90}$ = 0.1263 or 12.63%

Where,
I = Interest
t = Tax rate
PD = Preference dividend
NP = Net proceeds

(b) Equity Shares (Retained Earnings) (K_e)

$= \frac{Expected dividend(D1)}{Current\ Market\ Price(P0)} +$ Growth Rate(G) $= \frac{50\%\ of\ ₹\,3.023}{₹\,30.25}$ = +0.11* = 0.16 or 16%

* Growth rate (on the basis of EPS) is calculated as below :

$\frac{EPS in current\ year - EPS in previous\ year}{EPS on\ previous\ year} = \frac{₹\,3.023 - ₹\,2.723}{₹\,2.723} = 0.11$

(Students may verify the growth trend by applying the above formula to last three or four years. Growth Rate is rounded off)

(ii) Calculation of marginal cost of capital (on the basis of existing capital structure):

Source of capital	Weight (a)	After tax Cost of capital (%) (b)	WACC (%) (a) × (b)
14% Debenture	0.15	7.07	1.0605
12% Preference shares	0.05	12.63	0.6315
Equity shares	0.80	16.00	12.800
Marginal cost of capital			**14.492**

(iii) The company can spend for capital investment before issuing new equity shares and without increasing its marginal cost of capital:
Retained earnings can be available for capital investment
= 50% of 2023 EPS × equity shares outstanding
= 50% of ₹ 3.023 × 2,00,000 shares = ₹3,02,300

Since, marginal cost of capital is to be maintained at the current level i.e. 14.492%, the retained earnings should be equal to 80% of total additional capital for investment.
Thus, investment before issuing equity = $\left(\frac{₹\,3,02,300}{80} \times 100\right)$ = ₹ 3,77,875
The remaining capital of ₹ 75,575 i.e. ₹ 3,77,875– ₹ 3,02,300 shall be financed by issuing 14% Debenture and 12% preference shares in the ratio of 3 : 1 respectively.

(iv) If the company spends more than ₹ 3,77,875 as calculated in part (iii) above, it will have to issue new shares at ₹ 22 per share.
The cost of new issue of equity shares will be:

$K_e = \frac{Expected dividend(D1)}{Current\ Market\ Price(P0)} +$ Growth Rate(g) $= \frac{50\%\ of\ ₹\,3.023}{₹\,22} +0.11 = 0.1787$ or 17.87%

Calculation of marginal cost of capital (assuming the existing capital structure will be maintained):

Source of capital	Weight (a)	Cost (%) (b)	WACC (%) (a) × (b)
14% Debenture	0.15	7.07	1.0605
12% Preference shares	0.05	12.63	0.6315

Equity shares	0.80	17.87	14.296
Marginal cost of capital			**15.988**

Question 8 : (RTP Nov 2023)

Jason Limited is planning to raise additional finance of ₹ 20 lakhs for meeting its new project plans. It has ₹ 4,20,000 in the form of retained earnings available for investment purposes. Further details are as following:

Debt / Equity Mix	30 / 70
Cost of Debt	
Upto ₹ 3,60,000	8 % (before tax)
Beyond ₹ 3,60,000	12 % (before tax)
Earnings per share	₹ 4
Dividend pay-out	50% of earnings
Current Market Price per share	₹ 44
Expected Growth rate in Dividend	10 %
Tax	40%

You are required:

(a) To determine the cost of retained earnings and cost of equity.

(b) To determine the post-tax average cost of additional debt.

(c) To determine the pattern for raising the additional finance, and

(d) Compute the overall weighted average after tax cost of additional finance.

Solution 8 :

(a) Cost of Equity / Retained Earnings (using dividend growth model)

Ke = $\frac{D1}{Po}$

where D1 = Do (1 + g) = 2 (1 + .10) = 2.2

Ke = $\frac{2.2}{44}$ + 0.10 = 0.15 or 15 %

(b) Cost of Debt (Post Tax)

Kd = I (1-t)

Upto 3,60,000 Kd = .08 (1-0.4) = 0.048

Beyond 3,60,000 = .12 (1-0.4) = 0.072

Thus, post-tax cost of additional debt = 0.048 x 3,60,000 / 6,00,000 + 0.072 x 2,40,000/ 6,00,000 = 0.0288 + 0.0288 = 0.0576 or 5.76%

(c) Pattern for Raising Additional Finance

Debt = 20,00,000 x 30% = 6,00,000

Equity = 20,00,000 x 70 % = 14,00,000

Out of this total equity amount of ₹ 14,00,000 - Equity Shares

= 14,00,000 – 4,20,000

= 9,80,000

And Retained Earnings = 4,20,000

(d) Overall Weighted Average after tax cost of additional finance

WACC = Kd x Debt Mix + Ke x Equity Mix = 0.0576 x 30% + 0.15 x 70% = 0.01728 + 0.105 = 0.1223 or 12.23% (approx.)

Question 1 : (MTP Sept 2023)

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.

Solution 1 :

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.

Question 2 : (MTP Sept 2023)

A company needs ₹ 42,50,000 for the construction of a new plant. The following three plans are feasible:

I. The company may issue 4,25,000 equity shares at ₹ 10 per share.

II.The company may issue 2,12,500 equity shares at ₹ 10 per share and 21,250 debentures of ₹ 100 denominations bearing an 8% rate of interest.

III.The company may issue 2,12,500 equity shares at ₹ 10 per share and 21,250 cumulative preference shares at ₹ 100 per share bearing an 8% rate of dividend.

(i) The company's earnings before interest and taxes are ₹ 75,000, ₹ 1,50,000, ₹ 3,00,000, ₹ 4,50,000 and ₹ 7,50,000. DETERMINE earnings per share under each of three financial plans? Assume a corporate income tax rate of 40%.

(ii) IDENTIFY which alternative would you recommend and why?

(iii) DETERMINE the EBIT-EPS indifference points by formulae between Financing Plan I and Plan II and Plan I and Plan III.

Solution 2 :

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

Plan I: Equity Financing

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Interest	0	0	0	0	0
EBT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Tax @ 40%	30,000	60,000	1,20,000	1,80,000	3,00,000
PAT	45,000	90,000	1,80,000	2,70,000	4,50,000
No. of equity shares	4,25,000	4,25,000	4,25,000	4,25,000	4,25,000
EPS	0.11	0.21	0.42	0.64	1.06

Plan II: Debt – Equity Mix

	(₹)	(₹)	(₹)	(₹)	(₹)
EBIT	75,000	1,50,000	3,00,000	4,50,000	7,50,000

Less: Interest	1,70,000	1,70,000	1,70,000	1,70,000	1,70,000
EBT	(95,000)	(20,000)	1,30,000	2,80,000	5,80,000
Less: Tax @ 40%	38,000*	8000*	52,000	1,12,000	2,32,000
PAT	(57,000)	(12,000)	78,000	1,68,000	3,48,000
No. of equity shares	2,12,500	2,12,500	2,12,500	2,12,500	2,12,500
EPS	(₹ 0.27)	(0.056)	0.37	0.79	1.64

* 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	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Interest	0	0	0	0	0
EBT	75,000	1,50,000	3,00,000	4,50,000	7,50,000
Less: Tax @ 40%	30,000	60,000	1,20,000	1,80,000	3,00,000
PAT	45,000	90,000	1,80,000	2,70,000	4,50,000
Less: Pref. dividend	1,70,000*	1,70,000*	1,70,000	1,70,000	1,70,000
PAT after Pref. dividend.	(1,25,000)	(80,000)	10,000	1,00,000	2,80,000
No. of Equity shares	2,12,500	2,12,500	2,12,500	2,12,500	2,12,500
EPS	(0.59)	(0.38)	0.05	0.47	1.32

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

(ii) From the above EPS computations tables under the three financial plans we can see that when EBIT is ₹ 4,50,000 or more, Plan II: Debt-Equity mix is preferable over the Plan I and Plan III, as rate of EPS is more under this plan. On the other hand, an EBIT of less than ₹4,50,000, Plan I: Equity Financing has higher EPS than Plan II and Plan III. Plan III Preference Share-Equity mix is not acceptable at any level of EBIT, as EPS under this plan is lower.

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

(iii) **EBIT – EPS Indifference point: Plan I and Plan II**

$$\frac{EBIT1\times(1-t)}{No.\ of\ equity\ shares(N1)}=\frac{(EBIT2-Interest)\times(1-t)}{No.\ of\ equity\ shares\ (N2)}$$

$$\frac{EBIT(1-0.40)}{4,25,000\ shares}=\frac{(EBIT-₹1,70,000)\times(1-0.40)}{2,12,500\ shares}$$

0.6 EBIT = 1.2 EBIT - ₹2,04,000

EBIT = $\frac{₹2,04,000}{0.6}$ = ₹3,40,000

Indifference points between Plan I and Plan II is ₹ 3,40,000

EBIT – EPS Indifference Point: Plan I and Plan III

$$\frac{EBIT1\times(1-t)}{No.\ of\ equity\ shares(N1)}=\frac{EBIT3\times(1-t)-pref.dividend}{No.\ of\ equity\ shares(N3)}$$

$$\frac{EBIT1(1-0.40)}{4,25,000\ shares}=\frac{EBIT3\times(1-0.40)-₹1,70,000}{2,12,500\ shares}$$

0.6EBIT= 1.2 EBIT - ₹3,40,000

EBIT = $\frac{₹3,40,000}{0.6}$ = ₹5,66,667

Indifference points between Plan I and Plan III is ₹ 5,66,667.

Questions 3 : (MTP October 2023)

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.

Solution 3 :

Working Notes:

1. Capital employed before expansion plan:

	(₹)
Equity shares (₹10 × 1,00,000 shares)	10,00,000
Debentures {(₹1,00,000/10) ´ 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 = $\frac{EBIT}{Capital\ employed} \times 100 = \frac{₹8,00,000}{₹40,00,000} \times 100 = 20\%$

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.

Question 4 : (MTP March 2024)

Capital structure (in market-value terms) of AN Ltd is given below:

Company	Debt	Equity
AN Ltd.	50%	50%

The borrowing rate for the company is 10% in a no-tax world and capital markets are assumed to be perfect.
Required:
(i) If Mr. R, owns 8% of the equity shares of AN Ltd., DETERMINE his return if the Company has net operating income of ₹ 10,00,000 and the overall capitalization rate of the company (Ko) is 20%.
(ii) CALCULATE the implied required rate of return on equity of AN Ltd.

Solution 4 :

Value of AN Ltd. = $\frac{NOI}{k_o} = \frac{₹\ 10,00,000}{20\%}$ = ₹ 50,00,000

(i) **Return on Shares of Mr. R on AN Ltd.**

Particulars	Amount (₹)
Value of the company	50,00,000
Market value of debt (50% x ₹ 50,00,000)	25,00,000
Market value of shares (50% x ₹ 50,00,000)	25,00,000
Particulars	**Amount (₹)**
Net operating income	10,00,000
Interest on debt (10% × ₹ 25,00,000)	2,50,000
Earnings available to shareholders	7,50,000
Return on 8% shares (8% × ₹ 7,50,000)	60,000

(ii) Implied required rate of return on equity of AN Ltd. = $\frac{₹\ 7,50,000}{₹\ 25,00,000}$ = 30%

Question 5 : (Nov 2023)

The data of K Textiles Lid, are given as follows:

Particulars	Amount (₹)
Profit Before Interest and Tax	50,00,000
Less: Interest on debentures @ 10%	10,00,000
Profit before tax	40,00,000
Less: Income tax @ 50%	20,00,000
Profit after tax	20,00,000
No. of equity shares (₹ 10 each)	10,00,000
EPS	2
PE Ratio	10
Market price per share	20

The Company is planning to start a new project needs to be having a total capital outlay of ₹ 40,00,000. You are informed that a debt equity ratio [D/D+E] higher than 36% pushes the Ke (cost of equity) up to 12.5%, means reducing the PE ratio to 8 and rises the interest rate on additional amount borrowed to 12%. Retained earnings of the company is ₹ 1.4 crores.

Find out the probable price of share if:

1. The additional funds are raised as a loan
2. The amount is raised by issuing equity shares.

Solution 5 :

In this question, EBIT after proposed extension is not given. Therefore, we can assume that existing return on capital employed will be maintained.

Working notes:

1. Return on Capital Employed = $\frac{EBIT}{Capital\ Employed}$ = $\frac{₹50,00,000}{₹3,40,00,000}$=14.70%

Capital Employed = Debt + Equity
= ₹ 1,00,00,000 + (₹ 1,00,00,000 + ₹ 1,40,00,000)
= ₹ 3,40,00,000

2. Proposed EBIT = Proposed Capital Employed x Return on capital employed
= (₹ 3,40,00,000 + ₹ 40,00,000) x 14.70% = ₹ 55,86,000

3. Debt Equity Ratio = $\frac{Debt}{Debt+Equity}$

Option1: Loan option

Debt = ₹ 1,00,00,000 + ₹ 40,00,000 = ₹ 1,40,00,000
Equity = ₹ 2,40,00,000

Debt Equity ratio= $\frac{1.4\ cr.}{1.4cr.+\ 2.40\ cr.}$= 36.84%

Debt equity ratio has crossed the limit of 36%, hence, PE ratio in this case will be 8 times and additional borrowing will be at the rate of 12%.

Option2: Equity option

Debt = ₹ 1,00,00,000
Equity = ₹ 2,40,00,000 + ₹ 40,00,000 = ₹ 2,80,00,000

Debt Equity ratio = $\frac{1\ cr.}{1\ cr.+\ 2.8\ cr.}$=26.32%

Debt equity ratio has not crossed the limit of 36% hence PE ratio in this case will remain at 10 times.

4. Number of equity shares to be issued in case of equity option @ ₹ 20 per share
= ₹ 40,00,000 / ₹ 20 = 2,00,000

Calculation of EPS and MPS under two financial options

Particulars	Financial Options	
	Option I 12% additional loan of 40,00,000	Option II 10,00,000 equity shares @ ₹ 10 and 2,00,000 equity shares @ ₹ 20
	(₹)	(₹)
Profit before interest and Tax (PBIT)	55,86,000	55,86,000
Less: Interest on old debentures @ 10%	10,00,000	10,00,000
Less: Interest on additional loan (new) @ 12% on ₹ 40,00,000	4,80,000	Nil
Profit before tax	41,06,000	45,86,000
Less: Taxes @ 50%	20,53,000	22,93,000
Earnings for equity shareholders (EAT/Profit after tax)	20,53,000	22,93,000
Number of Equity Shares	10,00,000	12,00,000
Earnings per Share (EPS)	2.05	1.91
Price/ Earnings ratio	8	10
Market price per share (MPS)	16.42	19.11

Question 6 : (May 2024)

Following data is available in respect of Levered and Unlevered companies having same business risk:
Capital employed = ₹2,00,000, EBIT = ₹25,000 and Ke = 12.5%

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@ 8%)	75,000	Nil
Equity	1,25,000	2,00,000

An investor is holding 12% shares in levered company.Calculate the increase in annual earnings of investor if he switches over his holding from Levered to Unlevered Company.

Question 7 : (MTP April 2024)

The GT Limited is willing to expand its business for which it requires an additional finance of ₹ 50,00,000. At present, the capital structure of the company is as under:

- 7,00,000 Equity shares of ₹ 10 each
- 10% Debentures ₹ 63,00,000
- 12% Term loan ₹ 54,00,000
- Retained earnings ₹ 1,30,00,000

At present, the company's EBIT is ₹ 54,00,000. However, the company, after expansion, expects ROI 2% greater than the present ROI, Income Tax Rate is 30%.
Following two options, for getting additional finance, are available-
(a) To raise funds as term loan @ 12%
(b) To raise funds by issuing 1,00,000 equity shares at ₹ 20 per share and balance by issuing 11% debentures at par.
Required:
(i) FIND out the market price of shares, if the P/E ratio is 10.
(ii) RECOMMEND the suitable option of raising funds with reason.

Solution 7 :

Expected return on capital employed Capital Employed = Debt + Equity
= (₹ 63,00,000 + ₹ 54,00,000) + (₹ 70,00,000 + ₹ 1,30,00,000)
= ₹ 3,17,00,000

Return on capital employed/ROI = $\left(\frac{EBIT}{Capital\ Employed}\right)$ x 100

At present: = $\left(\frac{54,00,000}{3,17,00,000}\right)$ x 100 = 17.03%

Now company expects 2% more as ROI
So, Expected ROI = 17.03% + 2% = 19.03%
Proposed EBIT = Proposed Capital Employed x Return on capital employed
= (₹ 3,17,00,000 + ₹ 50,00,000) x 19.03% = ₹ 69,84,010

(i) Market Price per Share:

Particular	Financial Options	
	Option – I 12% term loan of ₹ 50,00,000	Option II 1,00,000 equity shares @ ₹ 20 and 11% debentures of ₹ 30,00,000
	(₹)	(₹)
EBIT	69,84,010	69,84,010
Less: Interest		
- 10% on old debentures	6,30,000	6,30,000
- 11% on new debentures	-	3,30,000
- 12% on old term loan	6,48,000	6,48,000
- 12% on new term loan	6,00,000	
Total Interest	18,78,000	16,08,000
EBT	51,06,010	53,76,010
Less Tax @ 30%	15,31,803	16,12,803
EAT	35,74,207	37,63,207
No. of equity shares	7,00,000	8,00,000
Earnings per share	5.11	4.70
P/E ratio	10	10
Market Price per Share = EPS x P/E ratio	51.06	47.04

(ii) Recommendation:
The option I is better and may be opted as both EPS and MPS are higher.

Question 8 : (RTP Sept 2024)
Company XYZ is unlevered and has a cost of equity of 20 percent and a total market value of ₹ 10,00,00,000. Company ABC is identical to XYZ in all respects except that it uses debt finance in its capital structure with a market value of ₹ 4,00,00,000 and a cost of 10 percent. FIND the market value of equity, weighted average cost of capital and cost of equity of ABC if the tax advantage of debt is 25 percent.

Solution 8 :
Computation of Market Value of Equity of Company ABC

Total market value of Company ABC
$V_{ABC} = V_{XYZ}$ + Bt..... (i)
Where,
V_{ABC} = Market value of leveraged company.
V_{XYZ} = Market value of unleveraged company.
B = Market value of debt.
t = Tax rate.
Now, given
V_{XYZ} = ₹ 10,00,00,000
B = ₹ 4,00,00,000
t = 25%
By substituting values in equation (i) above, we have
V_{ABC} = ₹ 10,00,00,000 + ₹ 4,00,00,000 ´ 0.25%
= ₹ 11,00,00,000
The Market Value of Equity (s) of Company ABC,
= ₹ 11,00,00,000 – ₹ 4,00,00,000
= ₹ 7,00,00,000
Weighted Average Cost of Capital of Company ABC

$WACC_{ABC}$ = $WACC_{XYZ}$[1- Bt/V_{ABC}]

= 20%$\left[1 - \frac{4,00,00,000}{11,00,00,000} \times 0.25\right]$ = 18.18%

Where,

$WACC_{ABC}$ is the weighted average cost of capital of the levered company ABC

$WACC_{XYZ}$ is the weighted average cost of capital of the unlevered company XYZ.

Cost of Equity of company ABC

R_{Eabc} =+R_{Exyz} [(1 - t)B/E(- RB)]

20%+[(1-.25)4,00,00,000/7,00,00,000(.20-.10)]

24.28% approx.

Where,

R_{EABC} is the cost of equity in the levered Company ABC.

R_{EXYZ} is the cost of equity in the unlevered Company XYZ.

E is the market value of equity.

B is the market value of debt.

R_B is the cost of debt

Question 9 : (RTP Sept 2024)

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.

Solution 9 :

(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/.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)	0.18	0.18

Assuming 40% taxes as per MM Approach

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

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 (V_L) = V_U + (Debt× Tax)
= ₹ 60,00,000 + (54,00,000 × 0.40)
= ₹ 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]	.2504
Weighted Average Cost of Capital (ko)*	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%

Question 10 : (RTP May 2024)

Following data is available in respect of two companies having same business risk:
Capital employed = ₹ 3,00,000, EBIT = ₹ 45,000 and Ke = 12.5%

Sources	A Ltd	B Ltd
	Levered Company (₹)	Unlevered Company (₹)
Debt (@10%)	1,50,000	Nil
Equity	1,50,000	

An investor is holding 20% shares in a levered company. CALCULATE the increase in annual earnings of the investor if he switches his holding from Levered to Unlevered company.

Solution 10 :

(i) Valuation of firms

Particulars	A Ltd	B Ltd
	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	45,000	45,000
Less: Interest on debt (10% × ₹ 1,50,000)	15,000	Nil
Earnings available to Equity shareholders	30,000	45,000
Ke	12.5%	12.5%
Value of Equity (S)	2,40,000	3,60,000

(Earnings available to Equity shareholders/Ke)		
Debt (D)	1,50,000	Nil
Value of Firm (V) = S + D	3,90,000	3,60,000

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

(ii) **Investment & Borrowings**

	₹
Sell shares in Levered company (₹ 2,40,000 x 20%)	48,000
Borrow money (₹ 1,50,000 x 20%)	30,000
Buy shares in Unlevered company	78,000

(iii) **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

Question 11 :(RTP Nov 2023)

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

Solution 11 :

Ascertainment of probable price of shares of Prakash limited

Particulars	**Plan-I** **If ₹ 5,00,000 is raised as debt (₹)**	**Plan-II** **If ₹ 5,00,000 is raised by issuing equity shares(₹)**
Earnings Before Interest and Tax (EBIT) {20% of new capital i.e., 20% of (₹15,00,000 +₹ 5,00,000)} (Refer working note1)	4,00,000	4,00,000
Less: Interest on old debentures (10% of ₹5,00,000)	(50,000)	(50,000)
Less: Interest on new debt (12% of ₹5,00,000)	(60,000)	–
Earnings Before Tax (EBT)	2,90,000	3,50,000
Less: Tax @ 50%	(1,45,000)	(1,75,000)
Earnings for equity shareholders (EAT)	1,45,000	1,75,000
No. of Equity Shares (refer working note 2)	25,000	35,000

Earnings per Share (EPS)	₹ 5.80	₹ 5.00
Price/ Earnings (P/E) Ratio (refer working note 3)	8	10
Probable Price Per Share (PE Ratio × EPS)	₹ 46.40	₹ 50

Working Notes:

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

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

CA NITIN GURU

Question 1 : (MTP Sept 2023)

ZX Ltd. has a paid-up share capital of ₹ 2,00,00,000, face value of ₹ 100 each. The current market price of the shares is ₹ 100 each. The Board of Directors of the company has an agenda of meeting to pay a dividend of 50% to its shareholders. The company expects a net income of ₹ 1,50,00,000 at the end of the current financial year. Company also plans for a capital expenditure for the next financial year for a cost of ₹ 1,90,00,000, which can be financed through retained earnings and issue of new equity shares.

Company's desired rate of investment is 15%.

Required:

Following the Modigliani- Miller (MM) Hypothesis, DETERMINE value of the company when:

(i) It does not pay dividend and

(ii) It does pay dividend

Solution 1 :

As per MM Hypothesis, value of firm/ company is calculated as below:

V_f or nPo = $\frac{(n+\Delta n)P1-I+E}{(1+Ke)}$

Where,

Vf = Value of firm in the beginning of the period

n = number of shares in the beginning of the period

Δn = number of shares issued to raise the funds required

I = Amount required for investment

E = total earnings during the period

(i) Value of the ZX Ltd. when dividends are not paid.

$nP_1 = \frac{(n+\Delta n)P_1-I+E}{1+K_e}$

$nP_o = \frac{\left(2,00,000+\frac{40,00,000}{115}\right)\times ₹115-₹1,90,00,000+₹1,50,00,000}{(1+0.15)}$

$= \frac{₹2,70,00,000-₹1,90,00,000+₹1,50,00,000}{(1+0.15)} = ₹2,00,00,000$

Working notes:

1. Price of share at the end of the period (P1)

$P_o = \frac{P1+D1}{1+Ke}$

$100=\frac{P1+0}{1+0.15}$ or, P1= 115

2. Calculation of funds required for investment

Earnings	₹1,50,00,000
Dividend distributed	Nil
Fund available for investment	₹ 1,50,00,000
Total Investment	₹ 1,90,00,000
Balance Funds required	₹ 40,00,000

3. Calculation of no. of share required to be issued for balance fund

No. of share $(\Delta n)=\frac{Funds\ required}{Price\ at\ end(P1)}=\frac{40,00,000}{115}$ shares

$nP_1 = \frac{(n+\Delta n)P_1-I+E}{1+K_e}$

$nP_o = \frac{\left(2,00,000+\frac{40,00,000}{115}\right)\times ₹115-₹1,90,00,000+₹1,50,00,000}{(1+0.15)}$

$= \frac{₹2,70,00,000-₹1,90,00,000+₹1,50,00,000}{(1+0.15)} = ₹2,00,00,000$

Working notes:

4. Price of the share at the end of the period(P1)

P1 = $\frac{P1+D1}{1+Ke}$

$100=\frac{P1+50}{1+0.15}$ or, P1= ₹65

5. Calculation of funds required for investment

Earnings	₹ 1,50,00,000
Dividend distributed	₹ 1,00,00,000
Fund available for investment	₹ 50,00,000
Total Investment	₹ 1,90,00,000
Balance Funds required	₹ 1,40,00,000

6. Calculation of no. of shares required to be issued for balance fund

No. of shares (Δ) $= \frac{Funds\ required}{Price\ at\ end\ (P1)} = \frac{1,40,00,000}{65}$ = 2,15,385 share (approx.)

Note- As per MM-hypothesis of dividend irrelevance, value of firm remains same irrespective of dividend paid. In the solution, there may be variation in value, which is due to rounding off error.

Question 2 : (MTP October 2023)

PQR Ltd. is a blue-chip company listed in NSE in India with a face value of ₹ 100 per share. The company is expected to grow @ 15% p.a. for next four years then 5% for an indefinite period. The shareholders expect 20% return on their share investments. Company paid ₹ 150 as dividend per share for the current Financial Year. The shares of the company traded at an average price of ₹ 2,052 on last day. FIND out the intrinsic value per share and state whether shares are overpriced or underpriced.

Solution 2 :

As per Dividend discount model, the price of share is calculated as follows:

$$P=\frac{D1}{(1+Ke)^1}+\frac{D2}{(1+Ke)^2}+\frac{D3}{(1+Ke)^3}+\frac{D4}{(1+Ke)^4}+\frac{D5}{(Ke-g)}\times\frac{1}{(1+Ke)^4}$$

Where,

P = Price per share

Ke = Required rate of return on equity

g = Growth rate

$$P=\frac{₹150\times1.15}{(1+0.2)^1}+\frac{₹172.5\times1.15}{(1+0.2)^2}+\frac{₹198.38\times1.15}{(1+0.2)^3}+\frac{₹228.13\times1.15}{(1+0.2)^4}+\frac{₹262.35\times1.05}{(0.2-0.05)^1}\times\frac{1}{(1+0.2)^4}$$

P = 143.75 + 137.76 + 132.02 + 126.52 + 885.63 = ₹ 1425.68

Intrinsic value of share is ₹ 1425.68 as compared to latest market price of ₹ 2052. Market price of a share is overpriced by ₹ 626.32.

Question 3 : (MTP March 2024)

The following figures have been extracted from the annual report of Xee Ltd.:

Net Profit	₹ 54 lakhs
Outstanding 12% preference shares	₹ 200 lakhs
No. of equity shares	2 lakhs
Return on Investment	22%
Cost of capital i.e. (Ke)	15%

COMPUTE the approximate dividend pay-out ratio so as to keep the share price at ₹ 120 by using Walter's model?

(Decimal may be taken up to 2 units)

Solution 3 :

Particulars	(₹' in lakhs)
Net Profit	54
Less: Preference dividend	24
Earnings for equity shareholders	30
Earnings per share	30/2 = ₹ 15

Let, the dividend per share be D to get share price of ₹ 120.

$$P = \frac{D+\frac{r}{Ke}(E-D)}{ke}$$

Where, P = Market price per share.

E = Earnings per share = ₹ 15 D = Dividend per share

R = Return earned on investment = 22%

Ke = Cost of equity capital = 15%

$$120 = \frac{D + \frac{0.22}{0.15}(15 - D)}{0.15}$$

$$18 = \frac{0.15D + 3.3 - 0.22D}{0.15}$$

0.07D = 3.3 – 2.7

D = 8.57

D/P ratio = $\frac{DPS}{EPS}$ ×100 = $\frac{8.57}{15}$ ×100 = 57.13%

So, the required dividend pay-out ratio will be = 57.13%

Question 4 : (Nov 2023)

(i) EPS of a company is ₹ 60 and Dividend payout ratio is 60%. Multiplier is 5. Determine price per share as per Graham & Dodd model.

(ii) Last year's dividend is ₹ 6.34, adjustment factor is 45%, target payout ratio is 60% and current year's EPS is ₹ 12. Compute current year's dividend using Linter's model.

Solution 4 :

(i) Price per share (P) = $m\left(D + \frac{E}{3}\right)$

Where, m = Multiplier , D = Dividend , E = EPS

P = $5\left(60 \times 0.6 + \frac{60}{3}\right)$

P = 5(36 +20) = ₹ 280

(ii) $D_1 = D_o + [(EPS \times Target\ payout) - D_o] \times Adjustment\ factor$

$D_1 = 6.34 + [(12 \times 60\%) - 6.34] \times 0.45$

$D_1 = 6.34 + 0.387 = ₹ 6.727$

Question 5 : (Nov 2023)

INFO Ltd is a listed company having share capital of ₹ 2400 Crores of ₹ 5 each.

During the year 2022-23

Dividend distributed	1000%
Expected Annual growth rate in dividend	14%
Expected rate of return on its equity capital	18%

Required:

(a) Calculate price of share applying Gordon's growth Model.

(b) What will be the price of share if the Annual growth rate in dividend is only 10%?

(c) According to Gordon's growth Model, if Internal Rate of Return is 25%, then what should be the optimum dividend payout ratio in case of growing stage of company? Comment.

Answer 5 :

(a) In the present situation, the current MPS is as follows:

P = $\frac{Do(1+g)}{Ke-g}$

Where

P = Market price per share

D0 = current year dividend

g = growth rate of dividends

Ke = cost of equity capital/ expected rate of return

P = $\frac{50(1+0.14)}{0.18-0.14}$ = ₹ 1425

(b) The impact of changes in growth rate to 10% on MPS will be as follows:

P = $\frac{50(1+0.10)}{0.18-0.10}$ = ₹ 687.5

(c) If Internal rate of return, r = 25% and Ke = 18%

As per Gordon's model, when r > Ke, optimum dividend payout ratio is 'Zero'. When IRR is greater than cost of capital, the price per share increases and dividend pay- out decreases.

Question 6 : (May 2024)

Vista Limited's retained earnings per share for the year ending 31.03.2023 being 40% is ₹3.60 per share. Company is foreseeing a growth rate of 10% per annum in the next two years. After that the growth rate is expected to stabilize at 8% per annum. Company will maintain its existing pay-out ratio. If the investor's required rate of return is 15%, Calculate the intrinsic value per share as of date using Dividend Discount model.

Question 7 : (MTP April 2024)

SOC Ltd has 10 lakh equity shares outstanding at the beginning of the accounting year 2024. The existing market price per share is ₹ 600. Expected dividend is ₹ 40 per share. The rate of capitalization appropriate to the risk class to which the company belongs is 20%.

(i) CALCULATE the market price per share by the end of the year when expected dividends are: (a) declared, and (b) not declared, based on the Miller – Modigliani approach.

(ii) CALCULATE the number of shares to be issued by the company at the end of the accounting year on the assumption that the net income for the year is ₹ 15 crore; investment budget is ₹ 20 crores, when (a) Dividends are declared, and (b) Dividends are not declared.

(iii) PROVE that the market value of the shares at the end of the accounting year will remain unchanged irrespective of whether (a) Dividends are declared, or (ii) Dividends are not declared.

Solution 7 :

(i) Calculation of market price per share

According to Miller – Modigliani (MM) Approach:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

Existing market price (Po) = ₹ 600
Expected dividend per share (D1) = ₹ 40
Capitalization rate (ke) = 0.20
Market price at year end (P1) = ?

a. If expected dividends are declared, then 600=(P1+40)/(1+0.2)
600 x 1.2 = P1+40, **P1 = 680**

b. If expected dividends are not declared, then 600 = (P1+0)/(1 + 0.2)
600 x 1.2 = P1, **P1= 720**

(ii) **Calculation of number of shares to be issued (₹ lakh)**

	(a)	(b)
	Dividends are declared	**Dividends are not Declared**
Net income	1500	1500
Total dividends	(400)	-
Retained earnings	1100	1500
Investment budget	2000	2000
Amount to be raised by new issues	900	500
Relevant market price (₹ Per share)	680	720
No. of new shares to be issued (in lakh) (₹ 900 ÷ 680; ₹ 500 ÷ 720)	1.3235	0.6944

(iii) Calculation of market value of the shares

	(a)	(b)
Particulars	**Dividends are declared**	**Dividends are not Declared**
Existing shares (in lakhs)	10.00	10.00
New shares (in lakhs)	1.3235	0.6944
Total shares (in lakhs)	11.3235	10.6944
Market price per share (₹)	680	720

Total market value of shares at the end of the year (₹ in lakh)	11.3235 × 680 = 7,700 (approx.)	10.6944 × 720 = 7,700 (approx.)

Hence, it is proved that the total market value of shares remains unchanged irrespective of whether dividends are declared, or not declared

Question 8 : (RTP Sept 2024)

The following information is taken from Gamma Ltd.

Net Profit for the year	₹ 30,00,000
12% Preference share capital	₹ 1,00,00,000
Equity share capital (Share of ₹ 10 each)	₹ 60,00,000
Internal rate of return on investment	22%
Cost of Equity Capital	18%
Retention Ratio	75%

CALCULATE the market price of the share using:
(1) Gordon's Model
(2) Walter's Model

Solution 8 :

Market price per share by-

(1) Gordon's Model:

Present market price per share (Po)* = $\frac{D_o(1+g)}{Ke-g}$

OR

Present market price per share (Po) = $\frac{D_1}{K_e-g}$

Where,
Po = Present market price per share.
g = Growth rate (br) = 0.75 X 0.22 = 0.165
b = Retention ratio (i.e., % of earnings retained)
r = Internal rate of return (IRR)
E = Earnings per share

Po=$\frac{0.75(1+0.165)}{0.18-0.165}$=$\frac{0.874}{0.015}$ = ₹ 58.27 approx.

(2) Walter's Model:

P = $\frac{D+\frac{r}{Ke}(E-D)}{Ke}$

= $\frac{0.75+\frac{0.22}{0.18}(3-0.75)}{0.18}$ = ₹19.44

Workings:

1. Calculation of Earnings per share

Particulars	Amount (₹)
Net Profit for the year	30,00,000
Less: Preference dividend (12% of ₹ 1,00,00,000)	(12,00,000)
Earnings for equity shareholders	18,00,000
No. of equity shares (₹ 60,00,000/₹ 10)	6,00,000
Therefore, Earnings per share $(\frac{Earning\ for\ equity\ shareholders}{No.\ of\ Equity\ shares})$	₹ 18,00,000/6,00,000 = ₹ 3.00

2. Calculation of Dividend per share (D0)

Particulars	
Earnings per share	₹ 3
Retention Ratio (b)	75%
Dividend pay-out ratio (1-b)	25%
Dividend per share (Earnings per share x Dividend pay-out ratio)	₹ 3 x 0.25 = ₹ 0.75

Question 9 : (RTP May 2024)

MCO Ltd. has a paid-up share capital of ₹ 10,00,000, face value of ₹ 10 each. The current market price of the shares is ₹20 each. The Board of Directors of the company has an agenda of meeting to pay a dividend of 25% to its shareholders. The company expects a net income of ₹ 5,20,000 at the end of the current financial year. Company also plans for a capital expenditure for the next financial year for a cost of ₹ 7,50,000, which can be financed through retained earnings and issue of new equity shares. Company's desired rate of investment is 15%.

Required:

Following the Modigliani- Miller (MM) Hypothesis, DETERMINE value of the company when:

(i) It does not pay dividend and

(ii) It does pay dividend

Solution 9 :

As per MM Hypothesis, value of firm/ company is calculated as below:

Vf or nP_0 = $\frac{(n+\Delta n)P1-I+E}{(1+Ke)}$

Where,

Vf = Value of firm in the beginning of the period

n = number of shares in the beginning of the period

Δn = number of shares issued to raise the funds required

I = Amount required for investment

E = total earnings during the period

(i) **Value of the ZX Ltd. when dividends are not paid.**

nP_o = $\frac{(n+\Delta n)P1-I+E}{(1+Ke)}$

nP_o = $\frac{\left(1,00,000+\frac{2,30,000}{23}\right)\times ₹23-₹7,50,000+₹5,20,000}{(1+0.15)}$ = $\frac{₹25,30,000-₹7,50,000+₹5,20,000}{(1+0.15)}$ = ₹20,00,000

Working notes:

1. Price of share at the end of the period (P_1)

P_o = $\frac{P_1+D_1}{1+K_e}$

20 = $\frac{P_1+0}{1+0.15}$; or, P_1 = ₹ 23

2. Calculation of funds required for investment

Earnings	₹ 5,20,000
Dividend distributed	Nil
Fund available for investment	₹5,20,000
Total Investment	₹7,50,000
Balance Funds required	₹2,30,000

3. Calculation of no. of shares required to be issued for balance fund

No. of shares (Δn) = $\frac{Funds\ required}{Price\ at\ end(P1)}$ = $\frac{2,30,000}{23}$ shares = 10,000 shares

(ii) **Value of the ZX Ltd. when dividends are paid.**

nP_o = $\frac{(n+\Delta n)P1-I+E}{(1+Ke)}$

$\frac{\left(1,00,000+\frac{4,80,000}{20.5}\right)₹20.5-₹7,50,000+₹5,20,000}{(1+0.15)}$ = $\frac{₹25,30,000-₹7,50,000+₹5,20,000}{(1+0.15)}$ = ₹20,00,000

Working notes:

4. Price of share at the end of the period (P1)

P_o = $\frac{P_1+D_1}{1+K_e}$

20 = $\frac{P_1+2.5}{1+0.15}$ or, P_1 = ₹ 20.5

5. Calculation of funds required for investment

Earnings	₹ 5,20,000
Dividend distributed	₹ 2,50,000
Fund available for investment	₹ 2,70,000
Total Investment	₹ 7,50,000
Balance Funds required	₹ 4,80,000

6. Calculation of no. of shares required to be issued for balance fund

No. of shares (Δn) = $\frac{Funds\ required}{Price\ at\ end(P1)}$ = $\frac{4,80,000}{20.5}$ = 23,415 shares(approx.)

Question 10 : (RTP Nov 2023)

HM Ltd. is listed on Bombay Stock Exchange which is currently been evaluated by Mr. A on certain parameters. Mr. A collated following information:

(a) The company generally gives a quarterly interim dividend. ₹ 2.5 per share is the last dividend declared.

(b) The company's sales are growing by 20% on a 5-year Compounded Annual Growth Rate (CAGR) basis, however the company expects following retention amounts against probabilities mentioned as contention is dependent upon cash requirements for the company. Rate of return is 10% generated by the company.

Situation	Prob.	Retention Ratio
A	30%	50%
B	40%	60%
C	30%	50%

(c) The current risk-free rate is 3.75% and with a beta of 1.2 company is having a risk premium of 4.25%. You are required to help Mr. A in calculating the current market price using Gordon's formula.

Solution 10 :

Market price using Gordon's formula

P0 = $\frac{Do(1+g)}{Ke-g}$

D0 = 2.5×4 = 10 per share (annual)

g = br or retention ratio x rate of return

Calculation of expected retention ratio

Situation	Prob.	Retention Ratio	Expected Retention Ratio
A	30%	50%	0.15
B	40%	60%	0.24
C	30%	50%	0.15
Total			0.54

g = 0.54 × 0.10= 0.054 or 5.4%

Po = $\frac{Do(1+g)}{Ke-g}$

Po = $\frac{10(1+0.054)}{0.0885-0.054}$= $\frac{10.54}{0.0345}$=305.51

Ke = Risk free rate + (Beta x Risk Premium)

= 3.75% + (1.2 x 4.25%) = 8.85%

Question 11 : (Study Material)

Mr H is currently holding 1,00,000 shares of HM ltd, and currently the share of HM ltd is trading on Bombay Stock Exchange at ₹ 50 per share. Mr A have a policy to re-invest the amount of any dividend received into the shared back again of HM ltd. If HM ltd has declared a dividend of ₹ 10 per share, please determine the no of shares that Mr A would hold after he re-invests dividend in shares of HM ltd.

Question 12 : (Study Material)

Following information is given pertaining to DG ltd, No of shares outstanding - 1 lakh shares

Earnings Per share - 25 per share

P/E Ratio - 20

Book Value per share - 400 per share

If company decides to repurchase 5,000 shares, at the prevailing market price, what is the resulting book value per share after repurchasing.

CA NITIN GURU

Question 1 :(MTP Sept 2023)

A firm can make investment in either of the following two projects. The firm anticipates its cost of capital to be 10%. The pre-tax cash flows of the projects for five years are as follows:

Year	0	1	2	3	4	5
Project A (₹)	(3,00,000)	55,000	1,20,000	1,30,000	1,05,000	40,000
Project 8 (₹)	(3,00,000)	3,18,000	20,000	20,000	8,000	6,000

Ignore Taxation.

An amount of ₹ 45,000 will be spent on account of sales promotion in year 3 in case of Project A. This has not been considered in calculation of pre-tax cash flows.

The discount factors are as under:

Year	0	1	2	3	4	5
PVF (10%)	1	0.91	0.83	0.75	0.68	0.62

You are required to calculate for each project:

(i) The payback period
(ii) The discounted payback period
(iii) Desirability factor
(iv) Net Present Value

Solution 1 :

Calculation of Present Value of cash flows

Year	PV factor @ 10%	Project A		Project B	
		Cash flows (₹)	Discounted Cash flows	Cash flows (₹)	Discounted Cash flows
0	1.00	(3,00,000)	(3,00,000)	(3,00,000)	(3,00,000)
1	0.91	55,000	50,050	3,18,000	2,89,380
2	0.83	1,20,000	99,600	20,000	16,600
3	0.75	85,000(1,30,000-45,000)	63,750	20,000	15,000
4	0.68	1,05,000	71,400	8,000	5,440
5	0.62	40,000	24,800	6,000	3,720
Net Present Value			9,600		30,140

(i) The Payback period of the projects:

Project-A: The cumulative cash inflows up-to year 3 is ₹2,60,000 and remaining amount required to equate the cash outflow is ₹ 40,000 i.e. (₹ 3,00,000 – ₹ 2,60,000) which will be recovered from year-4 cash inflow. Hence, Payback period will be calculated as below:

3 years + $\frac{40,000}{1,05,000}$ = 3.381 years or 3 years, 4 months, 9 days (approx.)

Project-B: The cash inflow in year-1 is ₹ 3,18,000 and the amount required to equate the cash outflow is ₹ 3,00,000, which can be recovered in a period less than a year. Hence, Payback period will be calculated as below:

$\frac{3,00,000}{3,18,000}$ = 0.943 years or 11 months

(ii) Discounted Payback period for the projects:

Project-A: The cumulative discounted cash inflows up-to year 4 is ₹ 2,84,800 and remaining amount required to equate the cash outflow is ₹ 15,200 i.e. (₹ 3,00,000 – ₹ 2,84,800) which will be recovered from year-5 cash inflow. Hence, Payback period will be calculated as below:

4 years + $\frac{15,200}{24,800}$ = 4.613 years or 4 years, 2 months, and 11 days

Project-B: The cash inflow in year-1 is ₹2,89,380 and remaining amount required to equate the cash outflow is ₹ 10,620 i.e. (₹ 3,00,000 – ₹ 2,89,380) which will be recovered from year-2 cash inflow. Hence, Payback period will be calculated as below:

1 year + $\frac{10,620}{16,600}$ = 1.640 years or 1 Year, 7 months and 23 days.

(iii) Desirability factor of the projects

Desirability Factor (Profitability Index) = $\frac{Discounted\ value\ Cash\ Inflows}{Discounted\ value\ of\ Cash\ Outflows}$

Project A = $\frac{3,09,600}{3,00,000}$ = 1,032

Project B = $\frac{3,30,140}{3,00,000}$ = 1,100

(iv) Net Present Value (NPV) of the projects:

Please refer the above table.
Project A- ₹ 9,600
Project B- ₹ 30,140

Question 2 : (MTP October 2023)

A company proposes to install a machine involving a Capital Cost of ₹72,00,000. The life of the machine is 5 years and its salvage value at the end of the life is nil. The machine will produce the net operating income after depreciation of ₹13,60,000 per annum. The Company's tax rate is 35%.
The Net Present Value factors for 5 years are as under:

Discounting Rate	:	14	15	16	17	18	19
Cumulative factor	:	3.43	3.35	3.27	3.20	3.13	3.06

You are required to COMPUTE the internal rate of return (IRR) of the proposal.

Solution 2 :

Computation of cash inflow per annum	**₹**
Net operating income per annum	13,60,000
Less: Tax @ 35%	4,76,000
Profit after tax	8,84,000
Add: Depreciation (₹72,00,000 / 5 years)	14,40,000
Cash inflow	23,24,000

The IRR of the investment can be found as follows:
NPV = - ₹ 72,00,000 + ₹ 23,24,000 (PVAF5, r) = 0
or PVA F5 r (Cumulative factor) = $\frac{72,00,000}{₹23,24,000}$ = 3.09

Computation of Internal Rate of Return (IRR)

Discounting rate	15%	19%
Cumulative factor	3.35	3.06
Total NPV (₹)	77,85,400 (₹23,24,000 ´ 3.35)	71,11,440 (₹23,24,000 ´ 3.06)
Internal outlay (₹)	72,00,000	72,00,000
Surplus (Deficit) (₹)	5,85,400	(88,560)

IRR = LR + $\frac{NPV\ at\ LR}{NPV\ at\ LR - NPV\ at\ HR}$ × (HR -LR)
= 15% + $\frac{5,85,400}{5,85,400-(-88,560)}$ × (19% -15%)
= 15% +3.47 =18.47%

Note: Lower rate can be 18% or less than 18%. However, there will be no change in the final answer.

Question 3 : (MTP March 2024)

NC Ltd. Is considering purchasing a new machine to increase its production facility. At present, it uses an old machine which can process 5,000 units of TVs per week. NC could replace it with a new machine, which is product specific and can produce 15,000 units per week. New machine costs ₹ 100 crores and requires the working capital of ₹ 3 crores, which will be released at the end of 5th year. The new machine is expected to have a salvage value of ₹ 20 crores.
The company expects demand for TVs to be 10,000 units per week. Each TV sells for ₹ 30,000 and has Profit Volume Ratio (PV) of 0.10. The company works for 56 weeks in the year. Additional fixed costs (excluding depreciation) are estimated to increase by ₹ 10 crores. The company is subject to a 40% tax rate and its after-tax cost of capital is 20%. The relevant rate of depreciation is 25 % for both taxation and accounts. The company uses the WDV method of depreciation. The existing machine will have no scrap value.
You are required to:
ADVISE whether the company should replace the old machine. (Decimal may be taken up to 2 units)

Solution 3 :

(a) **Cash inflows after tax (CFAT)**

Particular	**₹**
Current production (units per week)	5,000 units

New capacity (units per week)	15,000 units
Demand (units per week)	10,000 units
Increase in sales (units per week) A.	5,000 units
Contribution per unit (₹ 30,000 x 0.10) B.	3,000
Increase in contribution A x B x 56	84 crores
Less: Additional fixed cost	10 crores
Increase in profit	74 crores
Less: Tax @ 40%	29.6 crores
Profit after tax	44.4 crores

Tax shield due to depreciation

Year	Depreciation (₹ in Crore)	Tax Shield (₹ in Crore)	PV Factor @ 20%	Total Present Value (₹ in Crore)
1	25.00	10	0.83	8.33
2	18.75	7.5	0.69	5.18
3	14.06	5.62	0.58	3.26
4	10.55	4.22	0.48	2.03
5	7.91	3.16	0.40	1.27
Total				20.07

Tax shield on capital loss = (23.73-20.00) x 30% = ₹ 1.12 crores Net Present Value (NPV)

Particulars	Year	Cash Flow (₹ in Crores)	PVAF @ 20%	Present Value (₹ in Crores)
Initial Investment	0	(100)	1	(100)
Working capital	0	(3)	1	(3)
Profit after tax	1-5	44.4	2.99	132.76
Salvage value	5	20	0.40	8.00
Tax shield on Depreciation	1-5			20.07
Tax shield on capital loss	5	1.12	0.40	0.45
Release of Working Capital	5	3	0.40	1.20
NPV				59.47

The company is advised to replace the old machine since the NPV of the new machine is positive.
(i) Cut-off Rate: It is the minimum rate which the management wishes to have from any project. Usually this is based upon the cost of capital. The management gains only if a project gives return of more than the cut - off rate. Therefore, the cut - off rate can be used as the discount rate or the opportunity cost rate.

Question 4 : (Nov 2023)

ABC Ltd. is considering to purchase a machine which is priced at ₹ 5,00,000. The estimated life of machine is 5 years and has an expected salvage value of ₹ 45,000 at the end of 5 years. It is expected to generate revenues of ₹ 1,50,000 per annum for five years. The annual operating cost of the machine is ₹ 28,125, Corporate Tax Rate is 20% and the cost of capital is 10%.
You are required to analyse whether it would be profitable for the company to purchase the machine by using;
(i) Payback period Method
(ii) Net Present value method
(iii) Profitability Index Method

Solution 4 :

Computation of Annual Cash Flows

Particular	(₹)
Revenue	1,50,000
Less: Operating Cost	(28,125)
Less: Depreciation $\frac{(5,00,000-45,000)}{5}$	(91,000)
Profit before Tax	30,875

Less: Tax	(6,175)
Profit after Tax	24,700
Add: Depreciation	91,000
Annual Cash Inflows	1,15,700

(i) Computation of Payback Period

Year	Cash Flows	Cumulative Present Value
1	1,15,700	1,15,700
2	1,15,700	2,31,400
3	1,15,700	3,47,100
4	1,15,700	4,62,800
5 (Including Salvage)	1,60,700	6,23,500

Amount to be recovered in 5th year cash flow = ₹ 5,00,000 – ₹ 4,62,800 = ₹ 37,200

Payback period = 4 years + $\frac{37,200}{1,60,700}$ = 4.23 years

Since the payback period is less than the life of machinery, the company may purchase the machine.

(ii) Computation of Net Present Value

Year	Cash Flows	PVF @10%	Present Value
0	(5,00,000)	1.000	(5,00,000)
1 - 5	1,15,700	3.791	4,38,594
5	45,000	0.621	27,941
Net Present Value			(33,465)

Since the net present value (NPV) is negative, the company should not purchase the machine.

(iii) Computation of Profitability Index (PI)

Profitability Index (PI) $= \frac{Sum\ of\ present\ value\ of\ net\ cash\ inflow}{Initial\ cash\ outflow}$

$= \frac{₹4,38,594+₹27,941}{₹5,00,000} = 0.93$

Since the profitability index is less than 1, the company should not purchase the machine.

Question 5 : (MTP April 2024)

An existing profitable company, RMC World Ltd. is considering a new project for manufacture of home automation gadget involving a capital expenditure of ₹ 1000 Lakhs and working capital of ₹ 150 Lakhs. The capacity of the plants for an annual production of 3 lakh units and capacity utilization during 5 year life of the project is expected to be as indicated below:

Year	1	2	3	4	5
Capacity Utilization (%)	50	65	80	100	100

The average price per unit of product is expected to be ₹600 netting a contribution of 60 percent. The annual fixed costs, excluding depreciation, are estimated to be ₹500 Lakhs per annum from the third year onwards. For the first and second year, it would be ₹ 200 lakhs and
₹ 350 lakhs respectively.

Scrap value of the capital asset at the end of 5th year is ₹ 200 Lakhs. Depreciation on capital assets is provided on a written down value basis @ 40% p.a. for income tax purposes. The rate of income tax may be taken at 30%. The cost of capital is 12%. At the end of the third year an additional investment of ₹ 200 lakhs would be required for working capital. There is no capital gain tax applicable.

COMPUTE the NPV of the project. RMC World Ltd. is about to make a presentation to a Secure Venture Capital Firm. Secure Venture Capital Firms will invest in any project if the net addition to shareholder wealth from the project is above ₹ 100 lakhs.

Solution 5 :

Calculation of Cash Flow after Tax

	Year 1	Year 2	Year 3	Year 4	Year 5
Capacity	50%	65%	80%	100%	100%
Units	1,50,000	1,95,000	2,40,000	3,00,000	3,00,000

Contribution p.u. (600 x 60%)	360	360	360	360	360
Total Contribution	5,40,00,000	7,02,00,000	8,64,00,000	10,80,00,000	10,80,00,000
Less: Fixed Asset	2,00,00,000	3,50,00,000	5,00,00,000	5,00,00,000	5,00,00,000
Less: Depreciation (W.N.)	4,00,00,000	2,40,00,000	1,44,00,000	86,40,000	51,84,000
PBT	(60,00,000)	1,12,00,000	2,20,00,000	4,93,60,000	5,28,16,000
Less: Tax	(18,00,000)	33,60,000	66,00,000	1,48,08,000	1,58,44,800
PAT	(42,00,000)	78,40,000	1,54,00,000	3,45,52,000	3,69,71,200
Add: Depreciation	4,00,00,000	2,40,00,000	1,44,00,000	86,40,000	51,84,000
CFAT	3,58,00,000	3,18,40,000	2,98,00,000	4,31,92,000	4,21,55,200

Calculation of NPV

Year	Description	Cash Flow	PVF @12%	PV
0	Initial Investment	(10,00,00,000)	1	(10,00,00,000)
0	WC introduced	(1,50,00,000)	1	(1,50,00,000)
3	WC introduced	(2,00,00,000)	0.7118	(1,42,36,000)
1	CFAT	3,58,00,000	0.8929	3,19,65,820
2	CFAT	3,18,40,000	0.7972	2,53,82,848
3	CFAT	2,98,00,000	0.7118	2,12,11,640
4	CFAT	4,31,92,000	0.6355	2,74,48,516
5	CFAT	4,21,55,200	0.5674	2,39,18,860
5	WC released	3,50,00,000	0.5674	1,98,59,000
5	Scrap Sale	2,00,00,000	0.5674	1,13,48,000
	Net Present Value			3,18,98,684

Working Notes (W.N.)

Calculation of Depreciation

Year	Opening WDV	Depreciation	Closing WDV
1	10,00,00,000	4,00,00,000	6,00,00,000
2	6,00,00,000	2,40,00,000	3,60,00,000
3	3,60,00,000	1,44,00,000	2,16,00,000
4	2,16,00,000	86,40,000	1,29,60,000
5	1,29,60,000	51,84,000	77,76,000

Question 6 : (May 2024)

HCP Ltd. is a leading manufacturer of railway parts for passenger coaches and freight wagons. Due to high wastage of material and quality issues in production, the General Manager of the company is considering the replacement of machine A with a new CNC machine B. Machine A has a book value of ₹4,80,000 and remaining economic life is 6 years. It could be sold now at ₹1,80,000 and zero salvage value at the end of sixth year. The purchase price of Machine B is ₹24,00,000 with economic life of 6 years. It will require ₹1,40,000 for installation and ₹60,000 for testing. Subsidy of 15% on the purchase price of the machine B will be received from Government at the end of 1st year. Salvage value at the end of sixth year will be ₹3,20,000.

The General manager estimates that the annual savings due to installation of Machine B include a reduction of three skilled workers with annual salaries of ₹1,68,000 each, ₹4,80,000 from reduced wastage of materials and defectives and ₹3,50,000 from loss in sales due to delay in execution of purchase orders. Operation of Machine B will require the services of a trained technician with annual salary of ₹3,90,000 and annual operation and maintenance cost will increase by ₹1,54,000. The company's tax rate is 30% and it's required rate of return is 14%. The company follows straight line method of depreciation. Ignore tax savings on loss due to sale of existing machine.

The present value factors at 14% are:

Years	0	1	2	3	4	5	6
PV Factor	1	0.877	0.769	0.675	0.592	0.519	0.456

Required:

(i) Calculate the Net Present Value and profitability Index and advise the company for replacement decision.

(ii) Also Calculate the discounted pay-back period.

Question 7 : (RTP May 2024)

HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purposes but has a book value of ₹ 2,50,000 on 31st March. The machine has begun causing problems with breakdowns and it cannot fetch more than ₹ 40,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered ₹ 1,50,000 for the old machine as a trade-in on the new machine which has a price (before allowance for trade-in) of ₹ 6,00,000. The expected life of the new machine is 10 years with a salvage value of ₹ 35,000.

Further, the company follows a written down value method depreciation @ 10% but for tax purpose, straight line method depreciation is used considering that this is the only machine in the block of assets. A working capital of ₹ 50,000 will be needed and it will be released at the end of tenth year.

Given below are the expected sales and costs from both old and new machine:

	Old machine	New machine
Annual output	60,000 units	80,000 units
Selling price per unit	₹ 18	₹ 18
Annual operating hours	2,800	2,800
Material cost per unit	₹ 5	₹ 5
Labour cost per hour	₹ 50	₹ 75
Indirect cash cost per annum	₹ 1,00,000	₹ 1,75,000

From the above information, ANALYSE whether the old machine should be replaced or not if the opportunity cost of capital of the Company is 10%?

The Income tax rate is 30%. Further assume that book profit is treated as ordinary income for tax purpose. Also ESTIMATE the internal rate of return of the replacement decision. All calculations to be calculated to 3 decimal places.

Solution 7 :

Workings:

(i) Initial Cash Outflow:

	Amount (₹)
Cost of new machine	6,00,000
Less: Sale Price of existing machine Net of Tax (₹ 1,50,000 × 0.70)	1,05,000
	4,95,000

(ii) Terminal Cash Flows:

New Machine

	Amount (₹)
Salvage value of Machine Less: Depreciated WDV {₹ 6,00,000 - (₹ 56,500 × 10 years)}	35,000 35,000
Short Term Capital Gain (STCG) Tax	Nil
Net Salvage Value (cash flows)	Nil 35,000

(iii) **Computation of additional cash flows (yearly)**

Particulars	Existing machine	New Machine	Incremental
(1)	(2)	(3)	(4)=(3)−(2)
Annual output	60,000 units	80,000 units	20,000 units
	₹	₹	₹
(A) Sales revenue @ ₹ 18 per unit	10,80,000	14,40,000	3,60,000
(B) Less: Cost of Operation			
Material @ ₹ 5 per unit	3,00,000	4,00,000	1,00,000
Labour			
Old = 2,800 x ₹ 50	1,40,000		70,000
New = 2,800 x ₹ 75		2,10,000	
Indirect cash cost	1,00,000	1,75,000	75,000

Total Cost (B)	5,40,000	7,85,000	2,45,000
Profit Before Tax and depreciation (PBTD) (A – B)	5,40,000	6,55,000	1,15,000
Less: Depreciation $\left(\frac{6,00,000-35,000}{10}\right)$			56,500
Earning after depreciation before Tax			58,500
Less: Tax @30%			17,550
Earning after depreciation and Tax			40,950
Add: Depreciation			56,500
Net Cash inflow			97,450

Analysis: Since the Incremental Cash flow is positive, the old machine should be replaced.
Note: As mentioned in the question WDV of Machine is zero for tax purpose hence no depreciation shall be provided in existing machine.

(iv) **Calculation of IRR Computation of NPV @ 10%**

	Period	Cash flow (₹)	PVF @ 10%	PV (₹)
Incremental cash flows	1-10	97,450	6.144	5,98,733
Add: Release of Working Capital	10	50,000	0.386	19,300
Add: Terminal year cash	10	35,000	0.386	13,510
Less: Initial cash outflow	0	4,95,000	1	4,95,000
Less: Working capital	0	50,000	1	50,000
			NPV	86,543

Since NPV computed in Part (i) is positive. Let us discount cash flows at higher rate say at 20%

	Period	Cash flow (₹)	PVF @ 20%	PV (₹)
Incremental cash flows	1-10	97,450	4.192	4,08,510
Add: Release of Working Capital	10	50,000	0.162	8,100
Add: Terminal year cash	10	35,000	0.162	5,670
				4,22,280
Less: Initial Cash outflow	0	4,95,000	1	4,95,000
Less: Working capital	0	50,000	1	50,000
			NPV	(1,22,720)

Now we use interpolation formula:

$10\% + \frac{86,543}{86,543-(-1,22,720)} \times 10\%$

$10\% + \frac{86,543}{2,09,263} \times 10\%$

IRR = 10% + 4.14% = 14.14%

Summary of Results

		Decision
Incremental Cash Flow	₹ 97,450	Accept
IRR	14.14% > Cost of Capital (10%)	Accept

Question 8 :(RTP Nov 2023)

PQR Limited is considering buying a new machine which would have a useful economic life of five years, at a cost of ₹ 40,00,000 and a scrap value of ₹ 5,00,000, with 80 per cent of the cost being payable at the start of the project and 20 per cent at the end of the first year. The machine would produce 80,000 units per annum of a new product with an estimated selling price of ₹ 400 per unit. Direct costs would be ₹ 375 per unit and annual fixed costs, including depreciation calculated on a straight- line basis, would be ₹ 10,40,000 per annum.

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to ₹ 1,25,000 and ₹ 1,75,000 respectively.

EVALUATE the project using the NPV method of investment appraisal, assuming the company's cost of capital to be 12 percent.

Solution 8 :

Calculation of Net Cash flows

Contribution = (400 – 375) ´ 80,000 = ₹ 20,00,000

Fixed costs = 10,40,000 – [(40,00,000 – 5,00,000)/5] = ₹ 3,40,000

Year	Capital (₹)	Contribution (₹)	Fixed costs (₹)	Promotion (₹)	Net cash flow (₹)
0	(32,00,000)				(32,00,000)
1	(8,00,000)	20,00,000	(3,40,000)	(1,25,000)	7,35,000
2		20,00,000	(3,40,000)	(1,75,000)	14,85,000
3		20,00,000	(3,40,000)		16,60,000
4		20,00,000	(3,40,000)		16,60,000
5	5,00,000	20,00,000	(3,40,000)		21,60,000

Calculation of Net Present Value

Year	Net cash flow (₹)	12% discount factor	Present value (₹)
0	(32,00,000)	1.000	(32,00,000)
1	7,35,000	0.893	6,56,355
2	14,85,000	0.797	11,83,545
3	16,60,000	0.712	11,81,920
4	16,60,000	0.636	10,55,760
5	21,60,000	0.567	12,24,720
			21,02,300

The net present value of the project is **₹21,02,300.**

CA NITIN GURU

Question 1 : (MTP October 2023)

Cost sheet of X&Y Ltd. provides the following particulars:

	Amount per unit (₹)
Raw materials cost	260.00
Direct labour cost	125.00
Overheads cost	200.00
Total cost	585.00
Profit	75.00
Selling Price	660.00

The Company keeps raw material in stock, on an average for four weeks; work-in-progress, on an average for one week; and finished goods in stock, on an average for two weeks.

The credit allowed by suppliers is three weeks and company allow four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses is two weeks.

The Company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at ₹ 2,70,000.

Required:

PREPARE a statement showing estimate of Working Capital needed to finance an activity level of 2,40,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 75% complete in all respects.

Solution 1 :

Statement showing Estimate of Working Capital Needs

	(Amount in ₹)	(Amount in ₹)
A. Current Assets		
(i) Inventories:		
Raw material (4 weeks) $\left(\frac{2,40,000\ units \times ₹260}{52\ weeks} \times 4\ weeks\right)$	48,00,000	
WIP Inventory (1 week) $\left(\frac{2,40,000\ units \times ₹585}{52\ weeks} \times 1\ week\right) \times 0.75$	20,25,000	
Finished goods inventory (2 weeks) $\left(\frac{2,40,000\ units \times ₹585}{52\ weeks} \times 2\ weeks\right)$	54,00,000	1,22,25,000
(ii) Receivables (Debtors) (4 weeks) $\left(\frac{2,40,000\ units \times ₹585}{52\ weeks} \times 4\ weeks\right) \times \frac{4}{5}$		86,40,000
(iii) Cash and bank balance		2,70,000
Total Current Assets		2,11,35,000
B. Current Liabilities:		
(i) Payables (Creditors) for materials (3 weeks) $\left(\frac{2,40,000\ units \times ₹260}{52\ weeks} \times 3\ weeks\right)$		36,00,000
(ii) Outstanding wages (1 week) $\left(\frac{2,40,000\ units \times ₹125}{52\ weeks} \times 1\ week\right)$		5,76,923
(iii) Outstanding overheads (2 weeks) $\left(\frac{2,40,000\ units \times ₹200}{52\ weeks} \times 2\ weeks\right)$		18,46,154
Total Current Liabilities		60,23,077
Net Working Capital Needs (A – B)		1,51,11,923

Question 2 :(MTP October 2023)

The following information is provided by the Shrishti Ltd. for the year ending 31st March 2022.

Raw Material storage period	54 days
Work in progress conversion period	20 days
Finished Goods storage period	22 days
Debt Collection period	74 days
Creditors' payment period	25 days
Annual Operating Cost	45 crore

(Including depreciation of ₹42,00,000) (1 year = 360 days)
You are required to CALCULATE Operating Cycle period and Number of Operating Cycles in a year.

Solution 2 :

Calculation of Operating Cycle Period and number of Operating Cycle in a Year

Operating Cycle Period = R + W + F + D – C
= 54 + 20 + 22 + 74 – 25 = 145 days

Number of Operating Cycle in a Year = $\frac{360}{Operating\ Cycle\ Period}$
= 360/145 = 2.48 times

Question 3 : (Nov 2023)

X Ltd. has furnished following cost sheet of per unit cost;

Raw material cost	₹ 150
Direct labour cost	₹ 40
Overhead cost	₹ 60
Total Cost	₹ 250
Profit	₹ 50
Selling Price	₹ 300

The company keeps raw material in stock on an average for 2 months; work in progress on an average for 3 months and finished goods in stock on an average 1 month. The credit allowed by suppliers is 1.5 months and company allows 2 months credit to its debtors. The lag in payment of wages is 1 month and lag in payment of overhead expenses is 1.5 months. The company sells 25% of the output against cash and maintain cash in hand at bank put together at ₹ 1,50,000. Production is carried on evenly throughout the year and wages and overheads also similarly. Work in progress stock is 75% complete in all respects. Prepare statement showing estimate of working capital requirements to finance an activity level of 15,000 units of production.

Solution 3 :

Statement showing Estimate of Working Capital Needs

(Receivables (Debtors) are calculated based on Cost of goods sold)

		(₹)	(₹)
A.	**Current Assets**		
(i)	Inventories:		
	Raw material (2 months) $\left(\frac{15,000\ units \times ₹150}{12\ months} \times 2\ months\right)$	3,75,000	
	WIP Inventory (3 months) $\left(\frac{15,000\ units \times ₹250}{12\ months} \times 3\ months\right) \times 0.75$	7,03,125	
	Finished goods inventory (1 months) $\left(\frac{15,000\ units \times ₹250}{12\ months} \times 1\ month\right)$	3,12,500	13,90,625
(ii)	Receivables (Debtors) (2 months) $\left(\frac{15,000\ units \times ₹250}{12\ months} \times 2\ months\right) \times 0.75$		4,68,750
(iii)	Cash and bank balance		1,50,000
	Total Current Assets		20,09,375
B.	**Current Liabilities:**		
(i)	Payables (Creditors) for materials (1.5 months) $\left(\frac{15,000\ units \times ₹150}{12\ months} \times 1.5\ months\right)$		2,81,250
(ii)	Outstanding wages (1 months) $\left(\frac{15,000\ units \times ₹60}{12\ months} \times 1\ month\right)$		50,000
(iii)	Outstanding overheads (1.5 months) $\left(\frac{15,000\ units \times ₹60}{12\ months} \times 1.5\ months\right)$		1,12,500
	Total Current Liabilities		4,43,750
	Net Working Capital Needs (A – B)		15,65,625

Alternative Solution

Statement showing Estimate of Working Capital Needs
(Receivables (Debtors) are calculated based on Selling price)

		(₹)	(₹)
A.	**Current Assets**		
(i)	Inventories:		
	Raw material (2 months) $\left(\frac{15,000\ units \times ₹150}{12\ months} \times 2\ months\right)$	3,75,000	
	WIP Inventory (3 months) $\left(\frac{15,000\ units \times ₹250}{12\ months} \times 3\ months\right) \times 0.75$	7,03,125	
	Finished goods inventory (1 months) $\left(\frac{15,000\ units \times ₹250}{12\ months} \times 1\ month\right)$	3,12,500	13,90,625
(ii)	Receivables (Debtors)(2 months) $\left(\frac{15,000\ units \times ₹300}{12\ months} \times 2\ months\right) \times 0.75$		5,62,500
(iii)	Cash and bank balance		1,50,000
	Total Current Assets		21,03,125
B.	**Current Liabilities:**		
(i)	Payables (Creditors) for materials (1.5 months) $\left(\frac{15,000\ units \times ₹150}{12\ months} \times 1.5\ months\right)$		2,81,250
(ii)	Outstanding wages (1 months) $\left(\frac{15,000\ units \times ₹40}{12\ months} \times 1\ month\right)$		50,000
(iii)	Outstanding overheads (1.5 months) $\left(\frac{15,000\ units \times ₹60}{12\ months} \times 1.5\ months\right)$		1,12,500
	Total Current Liabilities		4,43,750
	Net Working Capital Needs (A – B)		16,59,375

Question 4 : (MTP April 2024)

The below information for Lever Ltd is provided on annual basis:

	₹
Sales at 3 months credit	48,00,000
Materials consumed (suppliers extend 2 months credit)	12,00,000
Wages paid (one month lag in payment)	9,60,000
Cash manufacturing expenses (paid on month in arrear)	12,00,000
Administrative expense (one month lag in payment)	3,60,000
Sales promotion expense (paid monthly in advance)	1,20,000

The Company sells its products at a gross profit of 20%.
The Company keeps two months stock of raw materials and two months stock of finished goods.

Depreciation is considered as a part of the cost of production. Cash balance is retained at ₹ 1,00,000, Assuming a 15% margin, COMPUTE the working capital requirements of the Company on cash cost basis. Ignore work-in progress.

Solution 4 :

(i) Working Notes:

(i) Computation of Annual Cash Cost of Production	**(₹)**
Material consumed	12,00,000
Wages	9,60,000
Manufacturing expenses	12,00,000
Total cash cost of production	33,60,000
(ii) Computation of Annual Cash Cost of Sales:	**(₹)**
Total Cash cost of production as in (i) above	33,60,000
Administrative Expenses	3,60,000

Sales promotion expenses	1,20,000
Total cash cost of sales	38,40,000
Add: Gross Profit @ 20% on sales (25% on cost of sales)	9,60,000
Sales Value	48,00,000

Statement of Working Capital requirements (cash cost basis)

	(₹)	(₹)
A. Current Assets		
Inventory:		
- Raw materials $\frac{₹12,00,000}{12\ months}$ x 2 months	2,00,000	
- Finished Goods $\frac{₹\ 33,60,000}{12\ months}$ x 2 months	5,60,000	
Receivables (Debtors) $\frac{₹\ 38,40,000}{12\ months}$ x 3 months	9,60,000	
Sales Promotion expenses paid in Advance $\frac{₹1,20,000}{12\ months}$ x 1 months	10,000	
Cash balance	1,00,000	18,30,000
Gross Working Capital		18,30,000
B. Current Liabilities:		
Payables:		
- Creditors for materials $\frac{₹12,00,000}{12\ months}$ x 2 months	2,00,000	
Wages outstanding $\frac{₹9,60,000}{12\ months}$ x 1 month	80,000	
Manufacturing expenses outstanding $\frac{₹12,00,000}{12\ months}$ x 1 months	1,00,000	
Administrative expenses outstanding $\frac{₹3,60,000}{12\ months}$ x 1 months	30,000	4,10,000
Net working capital (A - B)		14,20,000
Add: Safety margin @ 15%		2,13,000
Total Working Capital requirements		16,33,000

Question 5 :(RTP Sept 2024)

TMT Limited is commencing a new project for manufacture of electric toys. The following cost information has been ascertained for annual production of 60,000 units at full capacity:

		Amount per unit (₹)
Raw materials		20
Direct labour		15
Manufacturing overheads:		
	₹	
Variable	15	
Fixed	10	25
Selling and Distribution overheads:		
	₹	
Variable	3	
Fixed	1	4
Total cost		64
Profit		16
Selling price		80

In the first year of operations expected production and sales are 40,000 units and 35,000 units respectively. To assess the need of working capital, the following additional information is available:

(i) Stock of Raw materials 3 months consumption.
(ii) Credit allowable for debtors 1½ months.
(iii) Credit allowable by creditors 4 months.
(iv) Lag in payment of wages 1 month.
(v) Lag in payment of overheads ½ month.
(vi) Cash in hand and Bank is expected to be ₹ 60,000.

(vii) Provision for contingencies is required @ 10% of working capital requirement including that provision. You are required to PREPARE a projected statement of working capital requirement for the first year of operations. Debtors are taken at cost.

Solution 5 :

Statement Showing Cost and Sales for the First Year

Annual Production Capacity	60,000 units
Production	40,000 units
Sales	35,000 units

Particulars	**₹**
Sales Revenue (₹ 80 ´ 35,000)	28,00,000
Cost of Production:	
Materials @ ₹ 20 per unit	8,00,000
Direct Labour @ ₹ 15 per unit	6,00,000
Manufacturing Overheads	
Variable @ ₹ 15 per unit	6,00,000
Fixed (based on production capacity 60,000 units x₹ 10)	6,00,000
Cost of Production	26,00,000
Less: Closing Stock (40,000 – 35,000 = 5,000 units)	
(₹ $\frac{26,00,000}{40,000}$ × 5,000 units)	3,25,000
Cost of Goods Sold	22,75,000
Add: Selling & Distribution Overheads	
Variable @ ₹ 3 ´ 35,000 units = 1,05,000	
Fixed (Re. 1 ´ 60,000 units) = 60,000	1,65,000
Cost of Sales	24,40,000
Profit	3,60,000

Statement Showing Working Capital Requirement

A.	**Current Assets**		**₹**
	Stock of Raw Materials	(₹ 8,00,000 x 3/12)	2,00,000
	Stock of Finished Goods		3,25,000
	Debtors at Cost	(₹ 24,40,000 x 3/24)	3,05,000
	Cash and Bank		60,000
	Total (A)		8,90,000
B.	**Current Liabilities**		
	Creditors for Materials	(₹ 10,00,000 x 4/12)	3,33,333
	Creditors for Expenses	(₹ 13,65,000 x 1/24)	56,875
	Outstanding Wages	(₹ 6,00,000 x 1/12)	50,000
	Total (B)		4,40,208
	Working Capital Requirement before Contingencies **(A – B)**		4,49,792
	Add: Provision for Contingencies (₹ 4,49,792 x 1/9)		49,977
	Estimated Working Capital Requirement		4,99,769

Workings Notes:

	₹
Purchase of Raw Material during the first year	
Raw Material consumed during the year	8,00,000
Add:Closing Stock of Raw Materials(3months consumption)	2,00,000
	10,00,000
Less: Opening Stock of Raw Material	Nil
Purchases during the year	10,00,000

Question 6 :(RTP Sept 2024)

Banu Limited is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. Currently, the firm has annual credit sales of ₹ 225 lakhs and accounts receivable turnover ratio of 5

times a year. The current level of loss due to bad debts is ₹ 7,50,000. The firm is required to give a return of 20% on the investment in new accounts receivables. Policy option II requires a manager to manage the receivables with salary of ₹ 50,000 per month. The company's variable costs are 60% of the selling price. Given the following information, which is a better option?

(Amount in lakhs)

	Present Policy	Policy Option I	Policy Option II
Annual credit sales (₹)	225	275	350
Accounts receivable turnover ratio	5	4	3
Bad debt losses (₹)	7.5	22.5	47.5

Solution 6 :

Statement showing Evaluation of Credit Policies (Amount in lakhs)

	Particulars	Present Policy (₹)	Proposed Policy I (₹)	Proposed Policy II (₹)
A	Expected Profit:			
	(a) Credit Sales	225.00	275.00	350.00
	(b) Total Cost other than Bad Debts:			
	Variable Costs other than manager salary	135.00	165.00	210.00
	(c)Salary of Manager	-	-	6
	(d) Bad Debts	7.50	22.50	47.50
	(e) Expected Profit [(a)-(b)-(c)-(d)]	82.50	87.50	86.50
B	Opportunity Cost of Investment in Receivables*	5.40	8.25	14.40
C	Net Benefits [A-B]	77.10	79.25	72.10

Recommendation: The Proposed Policy I should be adopted since the net benefits under this policy is higher than those under other policies.

Working Note:

***Calculation of Opportunity Cost of Average Investments**

Opportunity Cost = Total Cost × $\frac{Collection\ Period}{12} \times \frac{Rate\ of\ Return}{100}$

Present Policy = ₹ 135 lakhs × 2.4/12 × 20% = ₹ 5.40 lakhs

Proposed Policy I = ₹ 165 lakhs × 3/12 × 20% = ₹ 8.25 lakhs

Proposed Policy II = ₹ 216 lakhs × 4/12 × 20% = ₹ 14.40 lakhs

Question 7 : (RTP May 2024)

PQ Ltd. has commenced a new business segment in 2023-24. The following information has been ascertained for annual production of 25,000 units which is the full capacity.

	Cost per unit (₹)
Material	100
Labour and variable overhead expenses	50
Fixed manufacturing expenses	35
Depreciation	15
Selling expenses (80% variable)	10

In the first two years of operations, production and sales are expected to be as follows:

Year	Production (No. of units)	Sales (No. of units)
1	12,000	10,000
2	18,000	19,000

The selling price is expected to be ₹ 250 .

To assess the working capital requirements, the following additional information is available:

(a) Stock of materials — 2 months' average consumption

(b) Debtors — 1.5 month's average sales.

(c) Cash balance — ₹ 50,000

(d) Creditors for supply of materials — 1 month's average purchase during the year.

(e) Expenses — All expenses will be paid 1 month in advance during the year.

Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses.
The management is also of the opinion to make a 10% margin for contingencies on computed figures and value the closing stock at cost of production.
PREPARE, for the two years:
(i) A projected statement of Profit/Loss (Ignoring taxation); and
(ii) A projected statement of working capital requirements on a cash cost basis.

Solution 7 :

(i) PQ Limited

Projected Statement of Profit / Loss (Ignoring Taxation)

	Year 1	Year 2
Production (Units)	12,000	18,000
Sales (Units)	10,000	19,000
	(₹)	(₹)
Sales revenue (A) (Sales unit × ₹ 250)	25,00,000	47,50,000
Cost of production:		
Materials cost (Units produced × ₹ 100)	12,00,000	18,00,000
Direct labour and variable expenses (Units produced × ₹ 50)	6,00,000	9,00,000
Fixed manufacturing expenses (Production Capacity: 25,000 units × ₹ 35)	8,75,000	8,75,000
Depreciation (Production Capacity: 25,000 units × ₹ 15)	3,75,000	3,75,000
Gross Factory Cost	**30,50,000**	**39,50,000**
Add: Opening W.I.P.	-	2,91,000
Less: Closing W.I.P.	2,91,000	3,99,000
Cost of goods produced	**27,59,000**	**38,42,000**
Add: Opening stock of finished goods (Year 1 : Nil; Year 2 : 2,000 units)	-	4,59,833
Cost of Goods available for sale (Year 1: 12,000 units; Year 2: 20,000 units)	27,59,000	43,01,833
Less: Closing stock of finished goods at average cost (year 1: 2000 units, year 2 : 1000 units) (Cost of Production × Closing stock/ units produced)	4,59,833	2,13,444
Cost of Goods Sold	**22,99,167**	**40,88,389**
Add: Selling expenses – Variable (Sales unit × ₹ 8)	80,000	1,52,000
Add: Selling expenses -Fixed (25,000 units × ₹ 2)	50,000	50,000
Cost of Sales : (B)	24,29,167	42,90,389
Profit (+) / Loss (-): (A - B)	**70,833**	**4,59,611**

Working Notes:

Calculation of Stock of Work-in-progress

Particulars	Year 1	Year 2
	(₹)	(₹)
Raw Material (material cost × 15%)	1,80,000	2,70,000
Labour & Mfg. Expenses (Labour & mfg. expenses × 15% × 40%)	88,500	1,06,500
Depreciation (Depreciation × 15% × 40%)	22,500	22,500
Total	2,91,000	3,99,000

1. Calculation of creditors for supply of materials:

	Year 1 (₹)	Year 2 (₹)
Materials consumed during the year	12,00,000	18,00,000
Add: Closing stock (2 months average consumption)	2,00,000	3,00,000
	14,00,000	21,00,000

Less: Opening Stock	-	2,00,000
Purchases during the year	14,00,000	19,00,000
Average purchases per month (Creditors)	1,16,667	1,58,333

2. Prepayment for expenses:

	Year 1 (₹)	Year 2 (₹)
Direct labour and variable expenses	6,00,000	9,00,000
Fixed manufacturing expenses	8,75,000	8,75,000
Selling expenses (variable + fixed)	1,30,000	2,02,000
Total	16,05,000	19,77,000
Average per month	1,33,750	1,64,750

(ii) **Projected Statement of Working Capital Requirement (Cash Cost Basis)**

	Year 1 (₹)	Year 2 (₹)
(A) Current Assets		
Inventories:		
- Stock of Raw Material (12,000 units ₹ 100 2/12); (18,000 units ₹ 100 2/12)	2,00,000	3,00,000
- Finished Goods (Refer working note 3)	4,01,083	1,92,611
- Work In Process (Refer working note 5)	2,68,500	3,76,500
Receivables (Debtors) (Refer working note 4)	2,66,927	4,84,684
Prepayment for Expenses (Refer working note 2)	1,33,750	1,64,750
Minimum Cash balance	50,000	50,000
Total Current Assets/ Gross working capital (A)	13,20,260	15,68,545
(B) Current Liabilities		
Creditors for raw material (Refer working note 1)	1,16,667	1,58,333
Total Current Liabilities	1,16,667	1,58,333
Net Working Capital (A – B)	12,03,594	14,10,212
Add: 10% contingency margin	1,20,359	1,41,021
Total Working capital required	13,23,953	15,51,233

Working Note:

3. Cash Cost of Production:

	Year 1 (₹)	Year 2 (₹)
Gross Factory Cost as per projected Statement of P&L	30,50,000	39,50,000
Add: Opening W.I.P	-	2,68,500
Less: Closing W.I.P	2,68,500	3,76,500
Cost of goods produced	27,81,500	38,42,000
Less: Depreciation	(3,75,000)	(3,75,000)
Cash Cost of Production	24,06,500	34,67,000
Add: Opening Stock at Average Cost:	-	4,01,083
Cash Cost of Goods Available for sale	24,06,500	38,68,083
Less: Closing Stock at Avg. Cost	4,01,083	1,92,611
$\left(\frac{₹\ 24,06,500 \times 2,000}{12,000}\right)$		
$\left(\frac{₹\ 34,67,000 \times 1,000}{18,000}\right)$		
Cash Cost of Goods Sold	20,05,417	36,75,472

4. Receivables (Debtors)

	Year 1 (₹)	Year 2 (₹)
Cash Cost of Goods Sold	20,05,417	36,75,472
Add: Selling expenses – Variable (Sales unit × ₹ 8)	80,000	1,52,000
Add: Selling expenses -Fixed (25,000 units × ₹ 2)	50,000	50,000
Cash Cost of Debtors	21,35,417	38,77,472
Average Debtors	2,66,927	4,84,684

Calculation of Stock of Work-in-progress (Cash Cost Basis)

Particulars		(₹)
Raw Material (material cost × 15%)	1,80,000	2,70,000
Labour & Mfg. Expenses (Labour & mfg. expenses × 15% × 40%)	88,500	1,06,500
Total	2,68,500	3,76,500

Question 8 :(RTP Nov 2023)

A regular customer of your company has approached to you for extension of credit facility for purchasing of goods. On analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges:

Pattern of Payment Schedule	
At the end of 30 days	20% of the bill
At the end of 60 days	30% of the bill.
At the end of 90 days	30% of the bill
At the end of 100 days	18% of the bill
Non-recovery	2% of the bill

The customer wants to enter into a firm commitment for purchase of goods of ₹ 40 lakhs in 2022, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is ₹ 400 on which a profit of ₹ 20 per unit is expected to be made. It is anticipated that taking up of this contract would mean an extra recurring expenditure of ₹ 20,000 per annum. If the opportunity cost is 18% per annum, would you as the finance manager of the company RECOMMEND the grant of credit to the customer? Assume 1 year = 360 days.

Solution 8 :

Statement showing the Evaluation of credit Policies

Particulars			**Proposed Policy ₹**
A.	Expected Profit:		
	(a)	Credit Sales	**40,00,000**
	(b)	Total Cost	
		(i) Variable Costs (₹ 380 x 10000 units)	38,00,000
		(ii) Recurring Costs	20,000
			38,20,000
	(c)	Bad Debts	**80,000**
	(d)	Expected Profit [(a) – (b) – (c)]	**1,00,000**
B.	Opportunity Cost of Investments in Receivables		**1,31,790**
C.	Net Benefits (A – B)		**(31,790)**

Recommendation: The Proposed Policy should not be adopted since the net benefits under this policy are negative.

Working Note: Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × $\frac{Collection\ period}{360}$ × $\frac{Rate\ of\ Return}{100}$

Particulars	**20%**	**30%**	**30%**	**18%**	**Total**
A. Total Cost	7,64,000	11,46,000	11,46,000	6,87,600	**37,43,600**
B. Collection period	30/360	60/360	90/360	100/360	
C. Required Rate of Return	18%	18%	18%	18%	
D. OpportunityCost (A x B x C)	11,460	34,380	51,570	34,380	**1,31,790**

Question 9 : (RTP Nov 2023)

Consider the following figures and ratios:

(i) Sales for the year (all credit)	₹ 1,05,00,000
(ii) Gross Profit ratio	35 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	1.5:1

(vi)	Current ratio	2.5:1
(vii)	Receivables (Debtors) collection period	1 month
(viii)	Reserves and surplus to Share capital	1:1.5
(ix)	Capital gearing ratio	0.7875
(x)	Fixed assets to net worth	1.3 : 1

You are required to PREPARE:
(a) Balance Sheet as on 31/3/2022 based on above details.
(b) The statement showing working capital requirement if the company wants to make a provision for contingencies @ 14 percent of net working capital.

Solution 9 :

Working Notes:

(i) Cost of Goods Sold = Sales – Gross Profit (35% of Sales)
= ₹ 1,05,00,000 – ₹ 36,75,000 = ₹ 68,25,000

(ii) Closing Stock = Cost of Goods Sold / Stock Turnover
$= \frac{₹68,25,000}{6}$ = ₹ 11,37,500

(iii) Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
$= \frac{₹68,25,000}{1.5}$ = ₹ 45,50,000

(iv) Current Assets:
Current Ratio = 2.5 and Liquid Ratio = 1.5
Inventories (Stock) = 2.5 – 1.5 = 1
Current Assets = Amount of Inventories (Stock) x $\frac{2.5}{1}$
= ₹11,37,500 x $\frac{2.5}{1}$ = ₹28,43,750

(v) Liquid Assets (Receivables and Cash)
= Current Assets – Inventories (Stock)
= ₹ 28,43,750 – ₹ 11,37,500 = ₹ 17,06,250

(vi) Receivables (Debtors) = Sales x $\frac{Debtors\ Collection\ period}{12}$
= ₹1,05,00,000 × $\frac{1}{12}$ = ₹ 8,75,000

(vii) Cash = Liquid Assets – Receivables (Debtors)
= ₹ 17,06,250 – ₹ 8,75,000 = ₹ 8,31,250

(viii) Net worth = $\frac{Fixed\ Assets}{1.3}$
= $\frac{₹45,50,000}{1.3}$ = ₹35,00,000

(ix) Reserves and Surplus
Reserves and Share Capital = Net worth
Net worth = 1 + 1.5 = 2.5
Reserves and Surplus = ₹35, 00, 000 x $\frac{1}{2.5}$ = ₹ 14,00,000

(x) Share Capital = Net worth – Reserves and Surplus
= ₹ 35,00,000 – ₹ 14,00,000 = ₹ 21,00,000

(xi) Current Liabilities = Current Assets/ Current Ratio
= $\frac{₹28,43,750}{2.5}$ = ₹ 11,37,500

(xii) Long-term Debts
Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund
Long-term Debts = ₹ 35,00,000 × 0.7875 = ₹ 27,56,250

(a) Balance Sheet

Particulars	**Figures as at 31-03-2022 (₹)**	**Figures as at 31-03-2021 (₹)**
I. EQUITY AND LIABILITIES		
Shareholders' funds		
(a) Share capital	21,00,000	-
(b) Reserves and surplus	14,00,000	-
Non-current liabilities		
(a) Long-term borrowings	27,56,250	-

Current liabilities	11,37,500	-
TOTAL	**73,93,750**	-
II. ASSETS		
Non-current assets		
Fixed assets	45,50,000	-
Current assets		
Inventories	11,37,500	-
Trade receivables	8,75,000	-
Cash and cash equivalents	8,31,250	-
TOTAL	**73,93,750**	-

(b) **Statement Showing Working Capital Requirement**

Particulars	**(₹)**	**(₹)**
A. Current Assets		
(i) Inventories (Stocks)		11,37,500
(ii) Receivables (Debtors)		8,75,000
(iii) Cash in hand & at bank		8,31,250
Total Current Assets		28,43,750
B. Current Liabilities:		
Total Current Liabilities		11,37,500
Net Working Capital (A – B)		17,06,250
Add: Provision for contingencies (14% of Net Working Capital)		2,38,875
Working capital requirement		19,45,125

Question 10 : (May 2024)

(a) Following is the sales information in respect of Bright Ltd:

Annual Sales (90% on credit)	₹7,50,00,000
Credit period	45 days
Average Collection period	70 days
Bad debts	0.75%
Credit administration cost (Out of which 2/5th is avoidable)	₹18,60,000

A factor firm has offered to manage the company's debtors on a non-recourse basis at a service charge of 2%. Factor agrees to grant advance against debtors at an interest rate of 14% after withholding 20% as reserve. Payment period guaranteed by factor is 45 days. The cost of capital of the company is 12.5%. One time redundancy payment of ₹50,000 is required to be made to factor. Calculate the effective cost of factoring to the company.
(Assume 360 days in a year)

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