CA INTERMEDIATE

FINANCIAL MANAGEMENT

"TEST BOOK"

By

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"TEST YOUR KNOWLEDGE HERE"

ALL THE BEST
CA. NAMIT ARORA

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TEST 1 – EBIT & EPS ANALYSIS

Question 1

The following data are presented in respect of Quality Automation Ltd.:

Particulars	₹
Profit before interest and tax	52,00,000
Less: Debenture interest @ 12%	12,00,000
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)	8,00,000
Earning per share (EPS)	₹2.50
Price Earning (PE) Ratio,	10
Market Price Per Share	₹25.00

The company is planning to start a new project requiring a total capital outlay of ₹40,00,000. You are informed that a debt equity ratio (D/D+E) higher than 35% push the Ke up to 12.5% means reduce PE ratio to 8 and rises the interest rate on additional amount borrowed at 14%.

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.

(Note: Retained earnings of the company is ₹1.2 crore)

(10 Marks)

Question 2

Ganapati Limited is considering three financing plans. The key information is as follows:

(a) Total investment to be raised ₹2,00,000.
(b) Financing proportion of Plans:

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c) Cost of debt is 8%
Cost of preference shares is 8%
(d) Tax rate 50%
(e) Equity shares of the face value of ₹10 each will be issued at a premium of ₹10 per share
(f) Expected EBIT is ₹80,000.

You are required to determine for each plan:

(1) Earnings per share
(2) Financial break-even-point
(3) Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.

(10 Marks)

Question 3

A Company earns a profit of ₹3,00,000 per annum after meeting its interest liability of ₹1,20,000 on 12% debentures. The Tax rate is 50%. The number of Equity Shares of ₹10 each are 80,000 and the retained earnings amount to ₹12,00,000. The company proposes to take up an expansion scheme for which a sum of ₹4,00,000 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:
  (a) The additional funds were raised as debt
  (b) The additional funds were raised by issue of equity shares.

(ii) Advise the company as to which source of finance is preferable.

(6 Marks)

Question 4

RM Steels Limited requires ₹10,00,000 for the construction of new plant. It is considering three financial plans:

(1) The Company may issue 1,00,000 ordinary shares at ₹10 per share.
(2) The Company may issue 50,000 ordinary shares at ₹10 per share and 5,000 debentures of ₹100 denomination bearing 8% rate of interest.
(3) The Company may issue 50,000 ordinary shares at ₹10 per share and 5,000 preference shares at ₹100 per share bearing a 8% rate of dividend.

If RM Steels Limited's earnings before interest and taxes are ₹20,000, ₹40,000, ₹80,000, ₹1,20,000 and ₹2,00,000. Tax rate is 50%.

You are required to compute the earning per share under each of the three plans? Which alternative would you recommend for RM Steels and why?

(10 Marks)

SOLUTION TEST 1

Solution 1

Statement of Market Value Per Share (MPS)

Particulars	Debt Plan	Equity Plan
EBIT @ 17.⅓% of 3,40,00,000 (3,00,00,000 + 40,00,000)	58,93,333	58,93,333
Less: Interest: Existing	12,00,000	12,00,000
New (14% of ₹40,00,000)	5,60,000	-
EBT	41,33,333	46,93,333
Less: Tax @ 50%	20,66,667	23,46,667
PAT	20,66,666	23,46,666
÷ No. of Equity shares	8,00,000	9,60,000
EPS	₹2.583	₹2.444
× PE Ratio	8 Times	10 Times
MPS	₹20.66	₹24.44

Note: 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. Calculation of capital employed before expansion plan:

Equity share capital (8,00,000 shares × ₹10)	₹80,00,000
Retained earnings	₹1,20,00,000
Debentures (12,00,000/12%)	₹1,00,00,000
Total capital employed	₹3,00,00,000

2. Return on Capital Employed (ROCE):

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capital Employed}} \times 100 = \frac{52,00,000}{3,00,00,000} \times 100 = 17.⅓\%$$

3. Debt Equity Ratio if ₹40,00,000 is raised as Debt:

$$= \frac{1,40,00,000\ (1,00,00,000 + 40,00,000)}{3,40,00,000\ (3,00,00,000 + 40,00,000)} \times 100 = 41.18\%$$

As the debt equity ratio is more than 35% the P/E ratio will be brought down to 8 in Plan 1

4. Debt Equity Ratio if ₹40,00,000 is raised as Equity:

$$= \frac{1,00,00,000}{3,40,00,000} \times 100 = 29.41\%$$

As the debt equity ratio is less than 35% the P/E ratio in this case will remain at 10 times in Plan 2.

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

$$= \frac{40,00,000}{25} = 1,60,000 \text{ shares}$$

Decision: Though loan option has higher EPS but equity option has higher MPS therefore company should raise additional fund through equity option.

Solution 2

(1) Statement of EPS

Particulars	Alternatives		
	A	B	C
Earnings before interest and tax	80,000	80,000	80,000
Less: Interest @ 8% on ₹1,00,000	-	8,000	-
EBT	80,000	72,000	80,000
Less: Tax @ 50%	40,000	36,000	40,000
EAT	40,000	36,000	40,000
Less: Preference Dividend @ 8% on ₹1,00,000	-	-	8,000
Earning Available for Equity Shareholders	40,000	36,000	32,000
÷ No. of Equity shares (Issue price ₹20)	10,000	5,000	5,000
EPS	₹4.00	₹7.20	₹6.40

(2) Financial Break Even Point (EBIT equals to fixed financial cost):

Proposal A Financial B.E.P. = No Fixed Financial Cost = Zero

Proposal B Financial B.E.P. = Interest on Debt = 8,000

Proposal C Financial B.E.P. $= \frac{\text{Preference Dividend}}{(1-t)}$

$= \frac{8,000}{1-0.50}$ = 16,000

(3) Indifference Point:

Between Proposal A & B:

$$\frac{(EBIT-I)(1-T)}{N_A} = \frac{(EBIT-I)(1-T)}{N_B}$$

$$\frac{(EBIT-0)(1-0.50)}{10,000} = \frac{(EBIT-8,000)(1-0.50)}{5,000}$$

EBIT = ₹16,000

Between Proposal A & C:

$$\frac{(EBIT-I)(1-T)}{N_A} = \frac{\{(EBIT-I)(1-T)-PD\}}{N_C}$$

$$\frac{(EBIT-0)(1-0.50)}{10,000} = \frac{\{(EBIT-0)(1-0.50)-8,000\}}{5,000}$$

EBIT = ₹32,000

Between Proposal B & C:

$$\frac{(EBIT-I)(1-T)}{N_B} = \frac{\{(EBIT-I)(1-T)-PD\}}{N_C}$$

$$\frac{(EBIT-8,000)(1-0.50)}{5,000} = \frac{\{(EBIT-0)(1-0.50)-8,000\}}{5,000}$$

0.5 EBIT – 4,000 ≠ 0.5 EBIT – 8,000

There is no indifference point between the financial plans B and C. It can be seen that Financial Plan B dominates Plan C. Since, the financial break-even point of the former is only ₹8,000 but in case of latter it is ₹16,000.

Solution 3

(i) Statement of EPS

Particulars	Alternatives	
	Debt Plan	Equity Plan
Earnings before interest and tax @ 14% of ₹34,00,000	4,76,000	4,76,000
Less: Interest:		
Existing	1,20,000	1,20,000
New (12% on ₹4,00,000)	48,000	-
EBT	3,08,000	3,56,000
Less: Tax @ 50%	1,54,000	1,78,000
EAT	1,54,000	1,78,000
÷ No. of Equity shares		
Existing	80,000	80,000
New	-	40,000
EPS	₹1.925	₹1.483

(ii) Advise to the company: Since EPS is greater in the case when company arranges additional funds as debt. Therefore, the company should finance the expansion scheme by raising debt.

Working notes:

1. Calculation of capital employed before expansion plan:

Equity share capital	₹8,00,000
Retained earnings	₹12,00,000
Debentures (1,20,000/12%)	₹10,00,000
Total capital employed	₹30,00,000

2. Earnings before the payment of Interest and tax (EBIT):

Profit before tax	₹3,00,000
Interest	₹1,20,000
EBIT	₹4,20,000

3. Return on Capital Employed (ROCE):

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capital Employed}} \times 100 = \frac{4,20,000}{30,00,000} \times 100 = 14\%$$

4. After expansion capital employed = ₹34,00,000 (₹30,00,000 + ₹4,00,000)

Solution 4

1. Statement showing EPS with respect to various plans & different EBIT:

a. Equity Financing

Particulars	₹	₹	₹	₹	₹
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	(10,000)	(20,000)	(40,000)	(60,000)	(1,00,000)
EAT	10,000	20,000	40,000	60,000	1,00,000
÷ No. of Equity Shares	÷ 1,00,000	÷ 1,00,000	÷ 1,00,000	÷ 1,00,000	÷ 1,00,000
EPS	₹0.10	₹0.20	₹0.40	₹0.60	₹1.00

b. Debt - Equity Mix

Particulars	₹	₹	₹	₹	₹
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)
EBT	(20,000)	0	40,000	80,000	1,60,000
Less: Tax @ 50%	*10,000	0	(20,000)	(40,000)	(80,000)
EAT	(10,000)	0	20,000	40,000	80,000
÷ No. of Equity Shares	÷ 50,000	÷ 50,000	÷ 50,000	÷ 50,000	÷ 50,000
EPS	(₹0.20)	₹0.00	₹0.40	₹0.80	₹1.60

*10,000 is the tax saving in case of loss.

c. Preference Share - Equity Mix

Particulars	₹	₹	₹	₹	₹
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	(10,000)	(20,000)	(40,000)	(60,000)	(1,00,000)
EAT	10,000	20,000	40,000	60,000	1,00,000
Less: Preferential Dividend	**(40,000)	**(40,000)	(40,000)	(40,000)	(40,000)
EAT after Pref. Dividend	(30,000)	(20,000)	0	20,000	60,000
÷ No. of Equity Shares	÷ 50,000	÷ 50,000	÷ 50,000	÷ 50,000	÷ 50,000
EPS	(₹0.60)	(₹0.40)	₹0.00	₹0.40	₹1.20

**In case of cumulative preference shares, the company has to pay cumulative dividend to preference shareholders, when company earns sufficient profits, so deducted here even in case of insufficient profit to reach right decision.

2. Recommendation:

(a) If expected EBIT is less than ₹80,000 : Equity Finance (Alternative 1)
(b) If expected EBIT is equal to ₹80,000 : Equity or Debt - Equity Mix (Alternative 1 or 2)
(c) If expected EBIT is more than ₹80,000 : Debt – Equity Mix (Alternative 2)

TEST 2 – LEVERAGES

Question 1

Details of a company for the year ended 31st March, 2022 are given below:

Sales	:	₹86,00,000
Profit Volume (P/V) Ratio	:	35%
Fixed Cost excluding interest expense	:	₹10,00,000
10% Debt	:	₹55,00,000
Equity Share Capital of ₹10 each	:	₹75,00,000
Income Tax Rate	:	40%

Required:
(1) Determine company's Return on Capital Employed (Pre-tax) and EPS.
(2) Does the company have a favourable financial leverage?
(3) Calculate operating and combined leverage of the company.
(4) Calculate percentage change in EBIT, if sales increases by 10%
(5) At what level of sales, the Earning before tax (EBT) of the company will be equal to zero?

(10 Marks)

Question 2

The balance sheet of Gitashree Ltd. is given below:

Liabilities	₹	Assets	₹
Equity Share Capital (₹10 per share)	1,80,000	Net Fixed Assets	4,50,000
		Current Assets	1,50,000
Retained Earning	60,000		
10% Long Term Debt	2,40,000		
Current Liabilities	1,20,000		
	6,00,000		6,00,000

The company's total assets turnover ratio is 4 times, its fixed operating cost is ₹2,00,000 and its variable operating cost ratio is 60%. The income tax rate is 30%.

You are required to:

1. (a) Degree of Operating Leverage.
   (b) Degree of Financial Leverage.
   (c) Degree of Combined Leverage.

2. Determine the likely level of EBIT if EPS is (A) ₹1.00, (B) ₹2.00 and (C) ₹Nil.

(10 Marks)

Question 3

The following particulars relating to Navya Ltd. for the year ended 31st March 2023 is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹40
Variable cost per unit	₹20
Fixed cost	₹10,00,000

The capital structure of the company as on 31st March, 2023 is as follows:

Particulars	₹
Equity share capital (1,00,000 shares of ₹10 each)	10,00,000
Reserves and surplus	5,00,000
7% Debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

(1) Entirely by equity shares of ₹10 each at par.
(2) ₹5 lakh by issue of equity shares of ₹10 each and the balance by issue of 6% debentures of ₹100 each at par.
(3) Entirely by 6% debentures of ₹100 each at par.

Find out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

(10 Marks)

SOLUTION TEST 2

Solution 1

(1) ROCE = $\frac{\text{EBIT}}{\text{Capital Employed}} \times 100 = \frac{20,10,000}{55,00,000 + 75,00,000} \times 100 = 15.46\%$

Statement of EPS

Particulars	₹
Sales	86,00,000
Less: Variable cost @ of 65% (100 – P/V ratio) of sales	55,90,000
Contribution	30,10,000
Less: Fixed costs	10,00,000
EBIT	20,10,000
Less: Interest @ 10% of 55,00,000	5,50,000
EBT	14,60,000
Less: Income Tax @ 40%	5,84,000
EAT	8,76,000
÷ Number of Equity Shares	÷ 7,50,000
EPS	1.168

(2) ROCE is 15.46% and Interest on debt is 10%, hence, it has a favourable financial leverage.

(3) Calculation of Operating and Combined leverages:

Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{30,10,000}{20,10,000} = 1.497$

Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{30,10,000}{14,60,000} = 2.062$

(4) Operating leverage is 1.497. So if sales is increased by 10% then EBIT will be increased by 1.497 × 10 i.e. 14.97% (approx.)

(5)

EBT	=	Sales – Variable cost – Fixed cost – Interest
Nil	=	Sales – 65% sales – 10,00,000 – 5,50,000
35% of sales	=	15,50,000
Sales	=	₹44,28,571

Solution 2

1. (a) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{9,60,000}{7,60,000} = 1.26$

(b) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{7,60,000}{7,36,000} = 1.03$

(c) Combined Leverage = OL × FL = 1.26 × 1.03 = 1.30

2. Calculation of likely level of EBIT:

Earnings Per Share = $\frac{(\text{EBIT} - \text{I})(1 - \text{t})}{\text{N}}$

Case A: ₹1.00 = $\frac{(\text{EBIT} - 24,000)(1 - 0.30)}{18,000}$ or EBIT = ₹49,714

Case B: ₹2.00 = $\frac{(\text{EBIT} - 24,000)(1 - 0.30)}{18,000}$ or EBIT = ₹75,429

Case C: ₹0.00 = $\frac{(\text{EBIT} - 24{,}000)\ (1 - 0.30)}{18{,}000}$ or EBIT = ₹24,000

Working Note:

Income Statement

Particulars	₹
Sales (4 times of 6,00,000)	24,00,000
Less: Variable Cost @ 60% of 24,00,000	14,40,000
Contribution	9,60,000
Less: Fixed Cost	2,00,000
EBIT	7,60,000
Less: Interest @ 10% of 2,40,000	24,000
EBT	7,36,000

Solution 3

Statement Showing Profitability of Alternative Schemes for Financing

Particulars	Existing	Alt 1	Alt 2	Alt 3
Production (in units)	1,00,000	1,50,000	1,50,000	1,50,000
Sales value @ ₹40 per unit	40,00,000	60,00,000	60,00,000	60,00,000
Less: Variable cost @ ₹20/ ₹18 per unit	20,00,000	27,00,000	27,00,000	27,00,000
Contribution	20,00,000	33,00,000	33,00,000	33,00,000
Less: Fixed cost	10,00,000	15,00,000	15,00,000	15,00,000
EBIT	10,00,000	18,00,000	18,00,000	18,00,000
Less: Interest on loan:		70,000	70,000	70,000
Existing @ 7% of ₹10,00,000	70,000	-	30,000	60,000
New @ 6% of ₹5/₹10 Lakh	-			
EBT	9,30,000	17,30,000	17,00,000	16,70,000
Less: Tax @ 40%	(3,72,000)	(6,92,000)	(6,80,000)	(6,68,000)
EAT	5,58,000	10,38,000	10,20,000	10,02,000
÷ Number of Equity Shares (Existing + New)	÷ 1,00,000	÷ 2,00,000	÷ 1,50,000	÷ 1,00,000
EPS	₹5.58	₹5.19	₹6.80	₹10.02
Operating leverage (Contribution ÷ EBIT)	2.00	1.83	1.83	1.83
Financial Leverage (EBIT ÷ EBT)	1.08	1.04	1.06	1.08
Combined Leverage (Contribution ÷ EBT)	2.15	1.91	1.94	1.98
Risk	-	Lowest	Lower than Alt 3	Highest
Return	-	Lowest	Lower than Alt 3	Highest

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (3) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (2). Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., ₹10.02 per share) will be also in option (3).

So, if Navya Ltd. is ready to take a high degree of risk, then alternative (3) is strongly recommended. In case of opting for less risk, alternative (2) is the next best option with a reduced EPS of ₹6.80 per share. In case of alternative (1), EPS is even lower than the existing option, hence not recommended.

TEST 3 – MANAGEMENT OF RECEIVABLES & PAYABLES

Question 1

A trader whose current sales are in the region of ₹6 lakhs per annum and an average collection period of 30 days wants to pursue a more liberal policy to improve sales. A study made by a management consultant reveals the following information:

Credit Policy	Increase in Collection Period	Increase in Sales	Present default anticipated
A	10 days	₹30,000	1.5%
B	20 days	₹48,000	2%
C	30 days	₹75,000	3%
D	45 days	₹90,000	4%

The selling price per unit is ₹3. Average cost per unit is ₹2.25 and variable costs per unit are ₹2. The current bad debt loss is 1%. Required return on additional investment is 20%. Assume a 360 days year.

Analyse which of the above policies would you recommend for adoption?

(10 Marks)

Question 2

A regular customer of your company has approached to you for extension of a credit facility for enabling them to purchase goods. On an 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 bills
At the end of 60 Days	30% of the bills
At the end of 90 Days	30% of the bills
At the end of 100 Days	18% of the bills
Non-recovery	2% of the bills

The customer wants to enter into a firm commitment for purchase of goods of ₹30 Lacs in 2023, 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 ₹300 on which a profit of ₹10 per unit is expected to be made. It is anticipated that taking up of this contract would mean an extra recurring expenditure of ₹10,000 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 year of 360 days.

(10 Marks)

Question 3

A Ltd. has a total sale of ₹6.4 crores and its average collection period is 90 days. The past experience indicates that bad debt losses are 1.5% on sales.

The expenditure incurred by the firm in administering its receivable collection efforts is ₹10,00,000. A factor is prepared to buy the firm's receivables by charging 2% commissions.

The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve.

(1) Calculate the effective cost of factoring to the firm (360 Days in a year),
(2) If bank finance for working capital is available at 14% interest, should the firm avail of factoring service?

SOLUTION TEST 3

Solution 1

Statement of Evaluation of Credit Policies

Particulars	Existing	A	B	C	D
No of units	2,00,000	2,10,000	2,16,000	2,25,000	2,30,000
Credit sales @ ₹3 per unit	6,00,000	6,30,000	6,48,000	6,75,000	6,90,000
Less: Variable cost @ ₹2 per unit	4,00,000	4,20,000	4,32,000	4,50,000	4,60,000
Less: Fixed cost (2.25 - 2) × 2,00,000	50,000	50,000	50,000	50,000	50,000
Profit before bad debt losses	1,50,000	1,60,000	1,66,000	1,75,000	1,80,000
Less: Bad debt losses	6,000	9,450	12,960	20,250	27,600
Expected Profit	1,44,000	1,50,550	1,53,040	1,54,750	1,52,400
Less: Required return on investment	7,500	10,444	13,389	16,667	21,250
Net Benefit	1,36,500	1,40,106	1,39,651	1,38,083	1,31,150

Recommendation: The Proposed Policy A (i.e. increase in collection period by 10 days or total 40 days) should be adopted since the net benefits under this policy are higher as compared to other policies.

Working notes:

Calculation of cost required rate of return:

$$\text{Required rate of return} = \text{Total cost} \times \frac{\text{Collection Period}}{360\,\text{Days}} \times \text{Rate of return}$$

$$\text{Existing Policy} = 4{,}50{,}000 \times \frac{30}{360\ \text{Days}} \times 20\% = 7{,}500$$

$$\text{Credit Policy A} = 4{,}70{,}000 \times \frac{40}{360\ \text{Days}} \times 20\% = 10{,}444$$

$$\text{Credit Policy B} = 4{,}82{,}000 \times \frac{50}{360\ \text{Days}} \times 20\% = 13{,}389$$

$$\text{Credit Policy C} = 5{,}00{,}000 \times \frac{60}{360\ \text{Days}} \times 20\% = 16{,}667$$

$$\text{Credit Policy D} = 5{,}10{,}000 \times \frac{75}{360\ \text{Days}} \times 20\% = 21{,}250$$

Solution 2

Statement of Evaluation of Credit Policy

Particulars	Proposed
Sales in units	10,000
Sales value @ ₹300 per unit	30,00,000
Less: Variable cost @ ₹290 per unit	29,00,000
Less: Extra recurring expenditure	10,000
Profit before bad debt	90,000
Less: Bad debts @ 2%	60,000
Expected Profit	30,000
Less: Opportunity cost of investment in receivables (WN)	1,00,395
Net Benefit	(70,395)

Recommendation: The proposed policy should not be adopted since the net benefit under this policy is negative.

Working notes:
Calculation of Opportunity cost of average investment:

Opportunity cost = Total cost × $\frac{\text{Average Collection Period}}{360}$ × Rate

= 29,10,000 × $^{69}/_{360}$ × 18% = 1,00,395

Calculation of Average collection period:

Average collection period = 30 days × 20% + 60 days × 30% + 90 days × 30% + 100 days × 18%

= 69 Days

Solution 3

(1) Statement of Effective Cost of Factoring to the Firm

Particulars	₹
(1) Cost of factoring:	
Factoring commission (3,20,000 × $^{360\ Days}/_{90\ Days}$)	12,80,000
Interest charges (6,33,600 × $^{360\ Days}/_{90\ Days}$)	25,34,400
Total (1)	38,14,400
(2) Savings:	
Saving in credit administration cost	10,00,000
Saving in bad debts (1.5% of 6,40,00,000)	9,60,000
Total (2)	19,60,000
Effective cost of factoring (1 - 2)	18,54,400
Rate of effective cost $\left(\frac{18,54,400}{1,34,46,400}\times 100\right)$	13.79%

Working Notes:

Calculation of advance:

Particulars	₹
Average receivables (6,40,00,000 × $^{90}/_{360}$)	1,60,00,000
Less: Factor reserve @ 10% of 1,60,00,000	16,00,000
Maximum possible advance	1,44,00,000
Less: Commission @ 2% of 1,60,00,000	3,20,000
Amount available for advance	1,40,80,000
Less: Interest (1,40,80,000 × 18% × $^{90}/_{360}$)	6,33,600
Amount of advance	1,34,46,400

(2) If bank finance for working capital is available at 14%, firm should avail factoring service at 13.79% which is lower than bank interest.

Note: Alternatively rate of effective cost also can be calculated by some authors on amount avail for advance (1,40,80,000).

TEST 4 – MANAGEMENT OF WORKING CAPITAL

Question 1

Following information is forecasted by the CS Limited for the year ending 31st March 2023:

	Bal as at 01.04.22	Bal as at 31.03.23
Raw Material	45,000	65,356
Work-in-process	35,000	51,300
Finished goods	60,161	70,175
Receivables	1,12,123	1,35,000
Payables	50,079	70,469
Annual purchases of raw materials (all credit)	4,00,000	
Annual cost of production	7,50,000	
Annual cost of goods sold	9,15,000	
Annual operating cost	9,50,000	
Sales (all credit)	11,00,000	
You may take one year as equal to 365 days		

You are required to calculate:

(i) Net operating cycle period.
(ii) Number of operating cycles in the year.
(iii) Amount of working capital requirement.

(10 Marks)

Question 2

PQ Ltd. a company newly commencing business in 2023 has the under-mentioned projected P & L Account:

Particulars	₹	₹
Sales		2,10,000
Cost of goods sold		1,53,000
Gross Profit		57,000
Administrative Expenses	14,000	
Selling Expenses	13,000	27,000
Profit Before Tax		30,000
Provision for taxation		10,000
Profit After Tax		20,000
The cost of goods sold has been arrived at as under:		
Materials used	84,000	
Wages and manufacturing Expenses	62,500	
Depreciation	23,500	
Cost of Finished Goods Produced	1,70,000	
Less: Stock of Finished Goods	17,000	
(10% of goods produced not yet sold)	1,53,000	

The figure given above relate only to finished goods and not to work-in-progress. 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 company believes in keeping materials equal to two months consumption in stock.

All expenses will be paid one month in advance. Suppliers of materials will extend 1-½months credit. Sales will be 20% for cash and rest at two months credit. 70% of the income tax will be paid in advance in quarterly installments. The company wishes to keep ₹8,000 in cash. 10% has to be added to the estimated

figure for unforeseen contingencies.

Prepare an estimate of working capital on cash cost basis.

(10 Marks)

Question 3

The management of MNP Company Ltd. is planning to expand its business and consult you to prepare an estimated working capital statement.

The records of the company revealed the following annual information:

Sales:	
Domestic at one month's credit	₹24,00,000
Export at three month's credit (Sales price 10% below Domestic price)	₹10,80,000
Material used (suppliers extend two months credit)	₹9,00,000
Lag in payment of wages - ½ month	₹7,20,000
Lag in payment of manufacturing expenses (cash) - 1 month	₹10,80,000
Lag in payment of administrative expenses - 1 month	₹2,40,000
Sales promotion expenses payable quarterly in advance	₹1,50,000
Income tax payable in four installments (of which one falls in the next financial year)	₹2,25,000

Rate of gross profit is 20%. Ignore work-in-progress and depreciation. The company keeps one month's stock of raw materials and finished goods (each) and believes in keeping ₹2,50,000 available to it including the overdraft limit of ₹75,000 not yet utilized by the company. The management is also of the opinion to make 12% margin for contingencies on computed figure.

You are required to prepare the estimated working capital statement for next year.

(10 Marks)

Question 4

The following information is provided by MNP Ltd. for the year ending 31st March, 2023:

Raw material storage period	45 days
Work-in progress conversion period	20 days
Finished Goods storage period	25 days
Debt collection period	30 days
Creditor's payment period	60 days
Annual Operating cost (including depreciation of ₹2,50,000)	₹25,00,000
Assume 360 days in a year.	

You are required to calculate:

I. Operating Cycle period.
II. Number of Operating Cycle in a year.
III. Amount of working capital required of the company on a cash cost basis.
IV. The company is a market leader in its product, there is virtually no competitor in the market. Based on a market survey it is planning to discontinue sales on credit and deliver products based on pre-payment in order to reduce its working capital requirement substantially. You are required to compute the reduction in working capital requirement in such a scenario.

(5 Marks)

SOLUTION TEST 4

Solution 1

(i) Operating cycle = R + W + F + D – C
= 53 + 21 + 26 + 41 – 55 = 86 Days

Calculations:

Raw materials storage period (R) = $\frac{\text{Average stock of raw materials}}{\text{Average cost of raw materials consumption per day}}$
= $\frac{55,178}{3,79,644 \div 365}$ = 53 days

Raw materials consumption = Opening RM + Purchases – Closing RM
= 45,000 + 4,00,000 – 65,356 = 3,79,644

WIP holding period = $\frac{\text{Average stock of WIP}}{\text{Average cost of production per day}}$
= $\frac{43,150}{7,50,000 \div 365}$ = 21 days

Finished Goods storage period = $\frac{\text{Average stock of FG}}{\text{Average cost of goods sold per day}}$
= $\frac{65,178}{9,15,000 \div 365}$ = 26 days

Debtors collection period = $\frac{\text{Average book debts}}{\text{Average credit sales per day}}$
= $\frac{1,23,562}{11,00,000 \div 365}$ = 41 days

Credit period availed = $\frac{\text{Average trade creditors}}{\text{Average credit purchases per day}}$
= $\frac{60,274}{4,00,000 \div 365}$ = 55 days

Calculation of averages:

1.	Average stock of raw materials	=	(45,000 + 65,356) ÷ 2	=	55,178
2.	Average stock of WIP	=	(35,000 + 51,300) ÷ 2	=	43,150
3.	Average stock of FG	=	(60,181 + 70,175) ÷ 2	=	65,178
4.	Average receivables	=	(1,12,123 + 1,35,000) ÷ 2	=	1,23,562
5.	Average payables	=	(50,079 + 70,469) ÷ 2	=	60,274

(ii) Number of operating cycles in the year:

$\frac{365}{\text{Operating cycle period}}$ = $\frac{365}{86}$ = 4.244 times

(iii) Amount of working capital required:

$\frac{\text{Annual operating cost}}{\text{Number of operating cycles}}$ = $\frac{9,50,000}{4.244}$ = ₹2,23,845 Or

$\frac{\text{Annual operating cost}}{365} \times$ Operating cycle period = $\frac{9,50,000}{365} \times 86$ = ₹2,23,836

Solution 2

Statement of Working Capital Requirement

Particulars	₹
(1) Current Assets:	
Raw materials (96,600 × $^{2}/_{12}$)	16,100
Work in progress	16,350
Finished goods	14,650
Debtors (1,58,850 × 80% × $^{2}/_{12}$)	21,180
Prepaid expenses:	
Wages and Manufacturing Expenses (66,250 × $^{1}/_{12}$)	5,521
Administrative Expenses (14,000 × $^{1}/_{12}$)	1,167
Selling Expenses (13,000 × $^{1}/_{12}$)	1,083
Advance tax paid [(70% of 10,000) × $^{3}/_{12}$]	1,750
Cash	8,000
Total (1)	85,801
(2) Current Liabilities:	
Creditors (96,600 + 16,100) × $^{1.5}/_{12}$	14,088
Provision for Tax (Net of Advance Tax) (10,000 × 30%)	3,000
Total (2)	17,088
Working Capital Before Provision(1 - 2)	68,713
Add : Provision for Contingencies @ 10% of 68,713	6,871
Working Capital Including Provision	75,584

Working Notes:

Projected Income Statement

Particulars	₹
Raw Materials (84,000 + 15%)	96,600
Wages and Manufacturing Expenses (62,500 + 15% of 62,500 × 40%)	66,250
Cost Upto Factory	1,62,850
Less: Closing WIP (84,000 × 15%) + (15% of 62,500 × 40%)	(16,350)
Cost of Production	1,46,500
Less: Closing FG (10% of 1,46,500)	(14,650)
Cost of Goods Sold	1,31,850
Administrative Expenses	14,000
Selling Expenses	13,000
Cash Cost of Sales	1,58,850

Solution 3

Statement of Working Capital Requirement (Cash Cost Basis)

Particulars	₹
(A) Current Assets:	
Raw Materials (9,00,000 × $^{1}/_{12}$)	75,000
Finished Goods (29,40,000 × $^{1}/_{12}$)	2,45,000
Debtors:	
Domestic (19,60,000 + 1,03,448) × $^{1}/_{12}$	1,71,954
Export (9,80,000 + 46,552) × $^{3}/_{12}$	2,56,638
Cash (2,50,000 – 75,000)	1,75,000
Prepaid Sales Promotion Expenses (1,50,000 × $^{1}/_{4}$)	37,500
Total (A)	9,61,092
(B) Current Liabilities:	
Creditors (9,00,000 × $^{2}/_{12}$)	1,50,000
Outstanding labour (7,20,000 × $^{0.5}/_{12}$)	30,000
Outstanding Manufacturing Expenses (10,80,000 × $^{1}/_{12}$)	90,000
Outstanding Administrative Expenses (2,40,000 × $^{1}/_{12}$)	20,000
Income Tax Payable (2,25,000 × $^{1}/_{4}$)	56,250
Total (B)	3,46,250

Working Capital Before Provision (A - B)	6,14,842
Add : Safety Margin @ 12% of 6,14,842	73,781
Working Capital	6,88,623

Working Notes:

1. Calculation of Cash cost of Debtors:

Export sales (10% below domestic sales price) = 10,80,000

Export sales equivalent to domestic sales = $10,80,000 \times \frac{100}{90}$ = 12,00,000

Total equivalent domestic sales = 24,00,000 + 12,00,000 = 36,00,000

Apportionment of cash cost of sales except sales promotion expenses in proportion of equivalent domestic sales between Domestic and Foreign Sales:

Domestic sales = $29,40,000 \times \frac{24,00,000}{36,00,000}$ = 19,60,000

Foreign sales = $29,40,000 \times \frac{12,00,000}{36,00,000}$ = 9,80,000

Apportionment of sales promotion expenses between Domestic and Foreign Sales in sales ratio:

Domestic sales = $1,50,000 \times \frac{24,00,000}{34,80,000}$ = 1,03,448

Foreign sales = $1,50,000 \times \frac{10,80,000}{34,80,000}$ = 46,552

2. Projected Income Statement

Particulars	₹
Raw Materials	9,00,000
Wages	7,20,000
Manufacturing Expenses (in cash)	10,80,000
Administration Expenses (in cash)	2,40,000
Cash Cost of Goods Sold	29,40,000
Sales Promotion Expenses (in cash)	1,50,000
Cash Cost of Sales	30,90,000

Assumption: Administrative expenses is related to production.

Solution 4

I. Operating cycle = R + W + F + D – C
= 45 + 20 + 25 + 30 – 60 = 60 Days

II. No. of operating cycle = $\frac{360}{60}$ = 6 times

III. Working Capital = Annual cash operating cost $\times \frac{\text{Operating cycle}}{360 \text{ Days}}$
= (₹25,00,000 – ₹2,50,000) $\times \frac{60 \text{ Days}}{360 \text{ Days}}$
= ₹3,75,000

IV. Reduction in working capital = (₹25,00,000 – ₹2,50,000) × 30 days/360 days
= ₹1,87,500

TEST 5 – TREASURY AND CASH MANAGEMENT

Question 1

From the information and the assumption that the cash balance in hand on 1st January 2023 is ₹72,500 prepare a cash budget.

Assume that 50% of total sales are cash sales. Assets are to be acquired in the months of February and April. Therefore, provisions should be made for the payment of ₹8,000 and ₹25,000 for the same. An application has been made to the bank for the grant of a loan of ₹30,000 and it is hoped that the loan amount will be received in the month of May.

It is anticipated that a dividend of ₹35,000 will be paid in June. Debtors are allowed one month's credit. Creditors for materials purchased and overheads grant one month's credit. Sales commission at 3% on sales is paid to the salesman each month.

Months	Sales	Materials Purchases	Salaries & Wages	Production Overheads	Office & Selling OH
January	72,000	25,000	10,000	6,000	5,500
February	97,000	31,000	12,100	6,300	6,700
March	86,000	25,500	10,600	6,000	7,500
April	88,600	30,600	25,000	6,500	8,900
May	1,02,500	37,000	22,000	8,000	11,000
June	1,08,700	38,800	23,000	8,200	11,500

(10 Marks)

Question 2

The following information relates to Zeta Limited, a publishing company:

The selling price of a book is ₹15, and sales are made on credit through a book club and invoiced on the last day of the month. Variable costs of production per book are materials (₹5), labour (₹4), and overhead (₹2). The sales manager has forecasted the following volumes:

Month	No. of Books
November	1,000
December	1,000
January	1,000
February	1,250
March	1,500
April	2,000
May	1,900
June	2,200
July	2,200
August	2,300

Customers are expected to pay as follows:

One month after sale	40%
Two months after the sale	60%.

The company produces the books two months before they are sold and the creditors for materials are paid two months after production. Variable overheads are paid in the month following production and are expected to increase by 25% in April; 75% of wages are paid in the month of production and 25% in the following month. A wage increase of 12.5% will take place on 1st March.

The company is going through a restructuring and will sell one of its freehold properties in May for ₹25,000, but it is also planning to buy a new printing press in May for ₹10,000. Depreciation is currently ₹1,000 per month, and will rise to ₹1,500 after the purchase of the new machine.

The company's corporation tax (of ₹10,000) is due for payment in March. The company presently has a cash balance at bank on 31st December 2023, of ₹1,500.

You are required to prepare a cash budget for the six months from January to June, 2023.

(10 Marks)

Question 3

You are given below the Profit & Loss Accounts for two years for a company:

Particulars	Year 1	Year 2	Particulars	Year 1	Year 2
To Opening stock	32,00,000	40,00,000	By Sales	3,20,00,000	4,00,00,000
To Raw materials	1,20,00,000	1,60,00,000	By Closing stock	40,00,000	60,00,000
To Stores	38,40,000	48,00,000	By Misc. Income	4,00,000	4,00,000
To Manufacturing exps	51,20,000	64,00,000			
To Other expenses	40,00,000	40,00,000			
To Depreciation	40,00,000	40,00,000			
To Net Profit	42,40,000	72,00,000			
	3,64,00,000	4,64,00,000		3,64,00,000	4,64,00,000

Sales are expected to be ₹4,80,00,000 in year 3.

As a result, other expenses will increase by ₹20,00,000 besides other charges. Only raw materials are in stock. Assume sales and purchases are in cash terms and the closing stock is expected to go up by the same amount as between year 1 and 2. You may assume that no dividend is being paid. The Company can use 75% of the cash generated to service a loan.

Compute how much cash from operations will be available in year 3 for the purpose? Ignore income tax.

(10 Marks)

Question 4

Tarus Ltd. has an estimated cash payments of ₹8,00,000 for a one month period and the payments are expected to steady over the period. The fixed cost per transaction is ₹250 and the interest rate on marketable securities is 12% p.a.

Calculate the optimal transaction size, average cash and number of transactions during one month.

(5 Marks)

SOLUTION TEST 5

Solution 1

Monthly Cash Budget for Six Months, January to June 2023

Particulars	Jan	Feb	March	April	May	June	Total
Opening balance	72,500	96,340	1,21,330	1,55,650	1,51,292	2,05,767	72,500
Receipts:							
Cash sales	36,000	48,500	43,000	44,300	51,250	54,350	2,77,400
Collection from debtors	-	36,000	48,500	43,000	44,300	51,250	2,23,050
Bank Loan	-	-	-	-	30,000	-	30,000
Cash available (A)	1,08,500	1,80,840	2,12,830	2,42,950	2,76,842	3,11,367	6,02,950
Payments:							
Payment for purchases	-	25,000	31,000	25,500	30,600	37,000	1,49,100
Salaries and wages	10,000	12,100	10,600	25,000	22,000	23,000	1,02,700
Production OH	-	6,000	6,300	6,000	6,500	8,000	32,800
Selling and Office OH	-	5,500	6,700	7,500	8,900	11,000	39,600
Sales commission	2,160	2,910	2,580	2,658	3,075	3,261	16,644
Purchase of Assets	-	8,000	-	25,000	-	-	33,000
Dividend paid	-	-	-	-	-	35,000	35,000
Total payments (B)	12,160	59,510	57,180	91,658	71,075	1,17,261	4,08,844
Closing balance (A - B)	96,340	1,21,330	1,55,650	1,51,292	2,05,767	1,94,106	1,94,106

Solution 2

Monthly Cash Budget for Six Months, January to June 2023

Particulars	Jan	Feb	March	April	May	June
Opening balance	1,500	3,250	1,500	(11,912)	(15,024)	576
Receipts:						
Sales receipts	15,000	15,000	16,500	20,250	25,500	29,400
Sell of property	-	-	-	-	25,000	-
Cash available (A)	16,500	18,250	18,000	8,338	35,476	29,976
Payments:						
Payment for purchases	5,000	6,250	7,500	10,000	9,500	11,000
Variable overheads	2,500	3,000	4,000	3,800	5,500	5,500
Wages	5,750	7,500	8,412	9,562	9,900	10,237
Printing press	-	-	-	-	10,000	-
Corporation tax	-	-	10,000	-	-	-
Total payments (B)	13,250	16,750	29,912	23,362	34,900	26,737
Closing balance (A - B)	3,250	1,500	(11,912)	(15,024)	576	3,239

Working note:

Calculation of Sales receipts, payment for Purchases, Variable overheads and Wages:

Particulars	Nov	Dec	Jan	Feb	March	April	May	June
Forecast sales in units (no. of books)	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200
1. Sales receipts:								
Sales @ ₹15/unit	15,000	15,000	15,000	18,750	22,500	30,000	28,500	33,000
1 month 40%	-	6,000	6,000	6,000	7,500	9,000	12,000	11,400
2 months 60%	-	-	9,000	9,000	9,000	11,250	13,500	18,000
	-	-	15,000	15,000	16,500	20,250	25,500	29,400
2. Pay for purchase:								
Quantity produced (2 months before sales)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
Materials cost @ ₹5 p.u.	5,000	6,250	7,500	10,000	9,500	11,000	11,000	11,500
Payment after 2 month	-	-	5,000	6,250	7,500	10,000	9,500	11,000

3. Pay for variable oh:								
Quantity produced	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
Variable oh @ ₹2 and ₹2.50 p.u. from April	2,000	2,500	3,000	4,000	3,800	5,500	5,500	5,750
Payment next month	-	2,000	2,500	3,000	4,000	3,800	5,500	5,500
4. Pay for wages:								
Quantity produced	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
Wages @ ₹4 and ₹4.50 p.u. from March	4,000	5,000	6,000	8,000	8,550	9,900	9,900	10,350
Same month 75%	3,000	3,750	4,500	6,000	6,412	7,425	7,425	7,762
Next month 25%	-	1,000	1,250	1,500	2,000	2,137	2,475	2,475
	-	4,750	5,750	7,500	8,412	9,562	9,900	10,237

Solution 3

Projected Profit and Loss Account for the year 3

(₹ in Lakhs)

Particulars	Year 2 (Actual)	Year 3 (Projected)	Particulars	Year 2 (Actual)	Year 3 (Projected)
To Raw Materials Consumed	140	168	By Sales	400	480
To Stores	48	57.60	By Misc. Income	4	4
To Manufacturing Expenses	64	76.80			
To Other Expenses	40	60			
To Depreciation	40	40			
To Net Profit	72	81.60			
	404	484		404	484

Cash Flow:

Particulars	(₹ in Lakhs)
Net Profit	81.60
Add: Depreciation	40
	121.60
Less: Cash required for increase in stock (20 Lakhs same as between year 1 and 2)	(20)
Net Cash Inflow	101.60

Available for servicing the loan: 75% of ₹1,01,60,000 = ₹76,20,000

Working Notes:

(a) Material consumed in year 2 = ₹140 Lakhs ÷ ₹400 lakhs = 35% of sales

Likely consumption in year 3 = ₹480 Lakhs × 35% = ₹168 Lakhs

(b) Stores are 12% of sales, as in year 2

(c) Manufacturing expenses are 16% of sales

Solution 4

Optimal transaction size = $\sqrt{\frac{2 \times 8,00,000 \times 12 \times 250}{0.12}}$ = ₹2,00,000

Number of transactions p.m. = Monthly cash requirement ÷ Transaction size

= ₹8,00,000 ÷ ₹2,00,000 = 4 transactions

TEST 6 – RATIO ANALYSIS

Question 1

Complete the following annual financial statements on the basis of ratios given below:

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

Particulars	₹	Particulars	₹
To Cost of goods sold	6,00,000	By Sales	20,00,000
To Operating expenses	-		
To EBIT	-		
	20,00,000		20,00,000
To Debenture interest	10,000	By EBIT	-
To Income tax	-		
To Net profit	-		
	-		-

Balance Sheet as at 31st March, 2023

Liabilities	₹	Assets	₹
Net worth:		Fixed assets	-
Share capital	-	Current assets:	
Reserve and surplus	-	Cash	-
10% Debenture	-	Stock	-
Sundry creditors	60,000	Debtors	35,000
	-		-

Net Profit to sales	5%	Current Ratio	1.5 times
Return on net worth	20%	Share capital to reserves	4 : 1
Rate of Income - tax	50%	Inventory turnover (based on cost of goods sold)	15 times

(10 Marks)

Question 2

Manan Pvt. Ltd. gives you the following information relating to the year ending 31st March, 2023:

Current Ratio	:	2.5 : 1
Debt-Equity Ratio	:	1 : 1.5
Return on Total Assets (After Tax)	:	15%
Total Assets Turnover Ratio	:	2
Gross Profit Ratio	:	20%
Stock Turnover Ratio	:	7
Net Working Capital	:	₹13,50,000
Fixed Assets	:	₹30,00,000
1,80,000 Equity Shares of	:	₹10 each
60,000, 9% Preference Shares of	:	₹10 each
Opening Stock	:	₹11,40,000

You are required to calculate:

(a) Quick Ratio
(b) Fixed Assets Turnover Ratio
(c) Proprietary Ratio
(d) Earnings per Share

(10 Marks)

Question 3

The Balance Sheets of A Ltd. and B Ltd. as on 31st March 2023 are as follows:

Particulars		A Ltd	B Ltd
Liabilities:			
	Share Capital	40,00,000	40,00,000
	Reserve and surplus	32,30,000	25,00,000
	Secured Loans	25,25,000	32,50,000
	Current Liabilities and provisions:		
	Sundry Creditors	15,00,000	14,00,000
	Outstanding Expenses	2,00,000	3,00,000
	Provision for Tax	3,00,000	3,00,000
	Proposed Dividend	6,00,000	-
	Unclaimed Dividend	15,000	-
Assets:		1,23,70,000	1,17,50,000
	Fixed Assets (Net)	80,00,000	50,00,000
	Investments	15,00,000	-
	Inventory at Cost	23,00,000	45,00,000
	Sundry Debtors	-	17,00,000
	Cash & Bank	5,70,000	5,50,000
		1,23,70,000	1,17,50,000

Additional information available:

(i) 75% of the Inventory in A Ltd. readily saleable at cost plus 20%,
(ii) 50% of Sundry Debtors of B Ltd. are due from C Ltd. which is not in a position to repay the amount B Ltd. agreed to accept 15% debentures of C Ltd.
(iii) B Ltd. had also proposed 15% dividend but that was not shown in the accounts.
(iv) At the year end, B Ltd. sold investments amounting to ₹1,20,000 and repaid Sundry Creditors.

On the basis of the given Balance Sheet and the additional information, you are required to evaluate liquidity of the companies. All working should form part of the answer.

(10 Marks)

Question 4

X Co. has made plans for the next year. It is estimated that the company will employ total assets of ₹8,00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at ₹4,80,000 and all other operating expenses are estimated at ₹80,000. The goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent.

You are required to calculate: (a) Operating profit margin (before tax), (b) Net profit margin (after tax); (c) Return on assets (on operating profit after tax); (d) Asset turnover and (e) Return on owners' equity.

(5 Marks)

SOLUTION TEST 6

Solution 1

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

Particulars	₹	Particulars	₹
To Cost of goods sold	6,00,000	By Sales	20,00,000
To Operating expenses	11,90,000		
To EBIT	2,10,000		
	20,00,000		20,00,000
To Debenture interest	10,000	By EBIT	2,10,000
To Income tax	1,00,000		
To Net profit	1,00,000		
	2,10,000		2,10,000

Balance Sheet as at 31st March, 2023

Liabilities	₹	Assets	₹
Net worth:		Fixed assets	5,70,000
Share capital	4,00,000	Current assets:	
Reserve and surplus	1,00,000	Cash	15,000
10% Debenture	1,00,000	Stock	40,000
Sundry creditors	60,000	Debtors	35,000
	6,60,000		6,60,000

Solution 2

(a) Calculation of Quick Ratio

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}} = \frac{9,90,000}{9,00,000} = 1.1 : 1$$

(b) Calculation of Fixed Assets Turnover Ratio

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Fixed Assets}} = \frac{1,05,00,000}{30,00,000} = 3.5$$

(c) Calculation of Proprietary Ratio

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}} = \frac{28,50,000}{52,50,000} = 0.54$$

(d) Calculation of Earnings per Equity Share (EPS)

$$\text{Earnings per Equity Share (EPS)} = \frac{\text{PAT} - \text{Preference Share Dividend}}{\text{Number of Equity Shares}}$$

$$= \frac{7,87,500 - 9\% \text{ of } 6,00,000}{1,80,000} = ₹4.075$$

Workings Notes:

(i) Current Ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.5$

Current Assets = 2.5 Current Liabilities

Working Capital = Current Assets – Current Liabilities

13,50,000 = 2.5 Current Liabilities – Current Liabilities

Current Liabilities = 13,50,000 ÷ 1.5 = 9,00,000

Current Assets = 2.5 Current Liabilities

		=	2.5 × 9,00,000		=	22,50,000
(ii)	Sales	=	Total Assets Turnover × Total Assets			
		=	2 × (Fixed Assets + Current Assets)			
			2 × (30,00,000 + 22,50,000)		=	1,05,00,000
(iii)	Cost of Goods Sold	=	80% of Sales			
		=	80% of 1,05,00,000		=	84,00,000
(iv)	Average Stock	=	$\frac{\text{Cost of Goods Sold}}{\text{Stock Turnover Ratio}}$	=	$\frac{84,00,000}{7}$ =	12,00,000
	Closing Stock	=	(Average Stock × 2) – Opening Stock			
		=	(12,00,000 × 2) – 11,40,000		=	12,60,000
	Quick Assets	=	Current Assets – Closing Stock			
		=	22,50,000 – 12,60,000		=	9,90,000
	Debt – Equity Ratio	=	$\frac{\text{Debt}}{\text{Equity}}$		=	1 : 1.5
	1.5 Debt	=	Equity			
	Total Assets	=	Equity + Preference Share Capital + Debt + CL			
	52,50,000	=	1.5 Debt + 6,00,000 + 1.5 Debt + 9,00,000		=	2.5 Debt
	Debt	=	37,50,000 ÷ 2.5		=	15,00,000
	Equity	=	15,00,000 × 1.5		=	22,50,000
	Proprietary Fund	=	Equity + Preference Share Capital			
		=	22,50,000 + 6,00,000		=	28,50,000
(v)	Profit After Tax (PAT)	=	Total Assets × Return on Total Assets			
		=	52,50,000 × 15%		=	7,87,500

Solution 3

Particulars	A	B
Current Assets and Liquid Assets:		
Stock (23,00,000 × 75%) + 20%	20,70,000	-
Debtor (17,00,000 × 50%)	-	8,50,000
Cash & Bank	5,70,000	5,50,000
Liquid Assets	26,40,000	14,00,000
Add: Stock (23,00,000 × 25%)	5,75,000	45,00,000
Total Current Assets	32,15,000	59,00,000
Current Liabilities:		
Proposed Dividend	6,00,000	6,00,000
Creditor	15,00,000	15,20,000
Out Expenses	2,00,000	3,00,000
Provision for tax	3,00,000	3,00,000
Unclaimed Dividend	15,000	-
	26,15,000	27,20,000

Evaluation of Liquidity

RATIO	A	B
1. Current Ratio $= \frac{CA}{CL}$	$\frac{32,15,000}{26,15,000} = 1.23$	$\frac{59,00,000}{27,20,000} = 2.17$
2. Liquid Ratio $= \frac{LA}{CL}$	$\frac{26,40,000}{26,15,000} = 1.009$	$\frac{14,00,000}{27,20,000} = .51$

Solution 4

(a) Operating Profit Margin = $\frac{\text{EBIT}}{\text{Sales}} \times 100 = \frac{1,60,000}{7,20,000} \times 100 = 22.22\%$

(b) Net Profit Margin = $\frac{\text{EAT}}{\text{Sales}} \times 100 = \frac{64,000}{7,20,000} \times 100 = 8.89\%$

(c) Return on Assets = $\frac{\text{EBIT}\,(1-t)}{\text{Assets}} = \frac{1,60,000\,(1-.50)}{8,00,000} = 10\%$

(d) Assets turnover = $\frac{\text{Sales}}{\text{Total Assets}} = \frac{7,20,000}{8,00,000} = 0.9$ times

(e) Return on Equity = $\frac{\text{EAT}}{\text{Equity Fund}} \times 100 = \frac{64,000}{4,00,000} \times 100 = 16\%$

The Net Profit is calculated as follows:

Particulars	₹
Sales Revenue (150% of ₹4,80,000)	7,20,000
Less: Direct Cost	4,80,000
Gross Profit	2,40,000
Less: Other operating expenses	80,000
Operating Profit/EBIT	1,60,000
Less: Interest on 8% Debt (8,00,000 × 50% × 8%)	32,000
EBT	1,28,000
Less: Taxes @ 50%	64,000
EAT	64,000

TEST 7 – INVESTMENT DECISIONS OR CAPITAL BUDGETING

Question 1

XYZ Ltd is planning to introduce a new product with a projected life of 8 years. The project to be set up in a backward region, qualifies for a one time (as its starting) tax free subsidy from the government of ₹20,00,000 equipment cost will be ₹140 lakhs and additional equipment costing ₹10,00,000 will be needed at the beginning of the third year. At the end of 8 years the original equipment will have no resale value but the supplementary equipment can be sold for ₹1,00,000. A working capital of ₹15,00,000 will be needed. The sales volume over the eight years period has been forecasted as follows:

Year	Units
1	80,000
2	1,20,000
3-5	3,00,000
6-8	2,00,000

A sale price of ₹100 per unit is expected and variable expenses will amount to 40% of sales revenue. Fixed cash operating costs will amount to ₹16,00,000 per year. In addition an extensive advertising campaign will be implemented requiring annual outlays as follows:

Year	(₹ in lakhs)
1	30
2	15
3-5	10
6-8	4

The company is subject to 50% tax rate and considers 12% to be an appropriate after tax cost of capital for this project. The company follows the straight line method of depreciation.

Should the project be accepted?

(10 Marks)

Question 2

Total fund available is ₹3,00,000. Determine the optimal combination of projects assuming that the projects are (a) Divisible or (b) Indivisible.

Project Name	Initial Investment	NPV
P	₹1,00,000	₹20,000
Q	₹3,00,000	₹35,000
R	₹50,000	₹16,000
S	₹2,00,000	₹25,000
T	₹1,00,000	₹30,000

(10 Marks)

Question 3

MNP Limited is thinking of replacing its existing machine by a new machine which would cost ₹60 lakhs. The company's current production is ₹80,000 units, and is expected to increase to 1,00,000 units, if the new machine is bought. The selling price of the product would remain unchanged at ₹200 per unit. The following is the cost of producing one unit of product using both the existing and new machine:

Particulars	Existing Machine (80,000 units)	New Machine (1,00,000 units)	Difference
Materials	75.00	63.75	(11.25)
Wages and Salaries	51.25	37.50	(13.75)

Supervision	20.00	25.00	5.00
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.50	14.25	(1.25)
Depreciation	0.25	5.00	4.75
Allocated Corporate Overheads	10.00	12.50	2.50
Total	183.25	165.50	(17.75)

The existing machine has an accounting book value of ₹1,00,000, and it has been fully depreciated for tax purpose. It is estimated that machine will be useful for 5 years. The supplier of the new machine has offered to accept the old machine for ₹2,50,000. However, the market price of old machine today is ₹1,50,000 and it is expected to be ₹35,000 after 5 years. The new machine has a life of 5 years and a salvage value of ₹2,50,000 at the end of its economic life.

Assume corporate Income tax rate at 40%, and depreciation is charged on straight line basis for Income-tax purposes. Further assume that book profit is treated as ordinary income for tax purpose. The opportunity cost of capital of the Company is 15%.

Required:

(i) Estimate net present value of the replacement decision.
(ii) Estimate the internal rate of return of the replacement decision.
(iii) Should Company go ahead with the replacement decision? Suggest.

Year (t)	1	2	3	4	5
$PVIF_{0.15,t}$	0.8696	0.7561	0.6575	0.5718	0.4972
$PVIF_{0.20,t}$	0.8333	0.6944	0.5787	0.4823	0.4019
$PVIF_{0.25,t}$	0.8000	0.6400	0.5120	0.4096	0.3277
$PVIF_{0.30,t}$	0.7692	0.5917	0.4552	0.3501	0.2693
$PVIF_{0.35,t}$	0.7407	0.5487	0.4064	0.3011	0.2230

(10 Marks)

Question 4

ANP Ltd. Is providing the following information:

Annual cost of saving	₹96,000
Useful life	5 years
Salvage value	zero
Internal rate of return	15%
Profitability index	1.05

Table of discount factor:

Discount Factor	Years					
	1	2	3	4	5	Total
15%	0.870	0.756	0.658	0.572	0.497	3.353
14%	0.877	0.769	0.675	0.592	0.519	3.432
13%	0.886	0.783	0.693	0.614	0.544	3.52

You are required to calculate:
(a) Cost of the project
(b) Payback period
(c) Net present value of cash inflow
(d) Cost of capital

(10 Marks)

SOLUTION TEST 7

Solution 1

Net Present Value

Year	Particulars	₹	DF @ 12%	PV
0	Initial outflows (140 – 20 + 15) Lakhs	(1,35,00,000)	1.000	(1,35,00,000)
1	CFAT	2,00,000	0.893	1,78,600
2	CFAT less Additional Equipment (34,50,000 – 10,00,000)	24,50,000	0.797	19,52,650
3 - 5	CFAT	85,25,000	1.915	1,63,25,375
6 – 8	CFAT	58,25,000	1.363	79,39,475
8	Working Capital and Salvage (15,00,000 + 1,00,000)	16,00,000	0.404	6,46,400
NPV				1,35,42,500

Company should accept the proposal having positive NPV of the project.

Working Notes:

1. Statement of CFAT

Particulars	1	2	3 – 5	6 – 8
Units sold	80,000	1,20,000	3,00,000	2,00,000
Sales @ ₹100 p.u.	80,00,000	1,20,00,000	3,00,00,000	2,00,00,000
Less: VC @ 40%	32,00,000	48,00,000	1,20,00,000	80,00,000
Contribution	48,00,000	72,00,000	1,80,00,000	1,20,00,000
Less: Advertisement expenses	(30,00,000)	(15,00,000)	(10,00,000)	(4,00,000)
Less: Cash fixed cost	(16,00,000)	(16,00,000)	(16,00,000)	(16,00,000)
Less: Depreciation	(15,00,000)	(15,00,000)	(16,50,000)	(16,50,000)
PBT	(13,00,000)	26,00,000	1,37,50,000	83,50,000
Less: Tax @ 50%	-	(6,50,000)	(68,75,000)	(41,75,000)
PAT	(13,00,000)	19,50,000	68,75,000	41,75,000
Add: Depreciation	15,00,000	15,00,000	16,50,000	16,50,000
CFAT	2,00,000	34,50,000	85,25,000	58,25,000

2. Depreciation:

Main equipment (t_0 - t_8) $= \frac{\text{Original Cost} - \text{Subsidy} - \text{Salvage}}{\text{Life of Equipment}} = \frac{1,20,00,000}{8 \text{ Years}}$

$= 15,00,000$

Additional equipment (t_3 - t_8) $= \frac{\text{Original Cost} - \text{Salvage}}{\text{Life of Equipment}} = \frac{9,00,000}{6 \text{ Years}}$

$= 1,50,000$

3. Tax for year 2 = 50% of (26,00,000 – 13,00,000) = 6,50,000

Note: As per section 32 of Income Tax Act "Depreciation is not allowed on subsidized part of asset"

Solution 2

(a) Statement of Rank and Selection of Projects
(Divisible Situation)

Projects	PI (1+ NPV/Investment)	Rank	Project Cost	Project (%)	Investment
P	1 + 20,000/1,00,000 = 1.20	3	₹1,00,000	100%	₹1,00,000
Q	1 + 35,000/3,00,000 = 1.11	5	₹3,00,000	-	-
R	1 + 16,000/50,000 = 1.32	1	₹50,000	100%	₹50,000

S	1 + 25,000/2,00,000 = 1.13	4	₹2,00,000	25%	₹50,000 (b.f.)
T	1 + 30,000/1,00,000 = 1.30	2	₹1,00,000	100%	₹1,00,000
Total Investment					₹3,00,000

Optimum investment: 100% of P, R, T and ¼ of S.

(b) Statement of Rank and Selection of Projects
(Indivisible Situation)

Possible Combinations	Combined Investment	Combined NPV
P + R + T	₹2,50,000	₹66,000
P + S	₹3,00,000	₹45,000
Q	₹3,00,000	₹35,000
R + S	₹2,50,000	₹41,000
S + T	₹3,00,000	₹55,000

Invest in combination of P, R and T having highest combined NPV and invest remaining ₹50,000 elsewhere.

Solution 3

(i) Statement of NPV

Year	Particulars	₹	DF @ 15%	PV
0	Initial outflows	(58,50,000)	1.0000	(58,50,000)
1 - 5	Cash Flow After Tax	22,84,000	3.3522	76,56,425
5	Net Salvage 2,50,000 – 35,000 (1 – 0.40)	2,29,000	0.4972	1,13,859
NPV				19,20,284

Working Notes:

1. Calculation of initial outflow:

Cost of new machine		₹60,00,000
Less: Exchange value of old machine		(₹2,50,000)
Add: Tax payment on profit on exchange of old machine (2,50,000 – Nil) × 40%		₹1,00,000
Initial outflow		₹58,50,000

2. Calculation of incremental CFAT:

Increase in sales (200 × 20,000 units)		₹40,00,000
Less: Increase in operating cost (1,00,000 × 148) – (80,000 × 173) (excluding Depreciation and Allocated overheads)		₹9,60,000
Less: Increase in depreciation [(60,00,00 – 2,50,000) ÷ 5] – Nil		₹11,50,000
Profit before tax		₹18,90,000
Less: Tax @ 40%		₹7,56,000
Profit after tax		₹11,34,000
Add: Depreciation		₹11,50,000
Incremental CFAT	₹22,84,000	

3. Calculation of Incremental Salvage:

Salvage of new machine (Salvage = WDV; no gain or loss)		₹2,50,000
Less: Salvage of old machine (Salvage > WDV)	₹35,000	
Tax on gain 40% of 35,000 (35,000 - Nil)	₹14,000	₹21,000
Incremental Salvage		₹2,29,000

Notes:

(a) The old machine could be sold for ₹1,50,000 in the market. Since exchange value is more than the market value, company will exchange it at ₹2,50,000.

(b) Old machine has fully depreciated for tax purpose, therefore depreciation of old machine as well as WDV are NIL.

(c) Allocated overheads are allocations from corporate office therefore they are irrelevant for computation of CFAT.

(ii) Calculation of IRR:

Since NPV computed in Part (i) is positive. Let us discount cash flows at higher rate say at 25% or 30%

Statement of NPV

Year	Particulars	₹	DF @ 25%	PV	DF @ 30%	PV
0	Initial outflows	(58,50,000)	1.0000	(58,50,000)	1.0000	(58,50,000)
1 - 5	Cash Flow After Tax	22,84,000	2.6893	61,42,361	2.4355	55,62,682
5	Incremental Salvage	2,29,000	0.3277	75,043	0.2693	61,670
NPV				3,67,404		-2,25,648

$$\text{IRR} = 25\% + \frac{3,67,404}{3,67,404 + 2,25,648} \times 5\% = 28.10\%$$

(iii) Advise: The company should go ahead with replacement project, since it has positive NPV.

Solution 4

(a) Cost of the project:

At IRR,

Present value of inflows = Present value of outflows

Present value of outflows = Annual cost of saving × Cumulative discount factor @ IRR for 5 years

= ₹96,000 × 3.353

Cost of project = ₹3,21,888

(b) Payback Period:

$$\text{Payback period} = \frac{\text{Initial Outflow}}{\text{Equal Annual Cash Inflows / Saving}}$$

$$= \frac{3,21,888}{96,000} = 3.353 \text{ years}$$

(c) Net Present Value of cash inflows:

$$\text{PI} = \frac{\text{PV of Inflows}}{\text{PV of Outflows}}$$

$$1.05 = \frac{\text{PV of Inflows}}{3,21,888}$$

PV of Inflows = 3,21,888 × 1.05 = ₹3,37,982.4

NPV = PV of inflows – PV of outflows

= ₹3,37,982.40 – ₹3,21,888 = ₹16,094.40

(d) Cost of Capital:

$$\text{Cum DF @ cost of capital for 5 years} = \frac{\text{Present Value of Inflows}}{\text{Annual Inflows}}$$

$$= \frac{3,37,982.40}{96,000} = 3.52065$$

Cost of capital = 13% (Given in table)

TEST 8 – COST OF CAPITAL

Question 1

The following is the capital structure of Simons Company Ltd. as on 31.12.1998:

Equity shares (10,000 shares of ₹100 each)	₹10,00,000
10% Preference shares of ₹100 each	₹4,00,000
12% Debentures	₹6,00,000
	₹20,00,000

The market price of the company's share is ₹110 and it is expected that a dividend of ₹10 per share would be declared for the year 1998. The dividend growth rate is 6%.

(i) If the company is in the 50% tax bracket, compute the WACC.
(ii) Assuming that in order to finance an expansion plan, the company intends to borrow a fund of ₹10,00,000 bearing 14% rate of interest, What will be the company's revised weighted average cost of Capital? This financing decision is expected to increase dividends from ₹10 to ₹12 per share. However, the market price of equity share is expected to decline from ₹110 to ₹105 per share.

(10 Marks)

Question 2

The R & G Company has following capital structure at 31st March, 2004, which is considered to be optimum:

13% debenture	₹3,60,000
11% preference share capital	₹1,20,000
Equity share capital (2,00,000 shares)	₹19,20,000

The company's share has a current market price of ₹27.75 per share. The expected dividend per share in next year is 50 percent of the 2004 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue:

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EPS (₹)	1.00	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773

The company can issue 14 percent new debenture. The company's debenture is currently selling at ₹98. The new preference issue can be sold at a net price of ₹9.80, paying a dividend of ₹1.20 per share. The company's marginal tax rate is 50%.

(i) Calculate the after tax cost (a) of a 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.
(iii) How much can be spent for capital investment before new ordinary share must be sold? Assuming that retained earning available for next year's investment are 50% of 2004 earnings.
(iv) What will be 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 to net ₹20 per share? The cost of debt and of preference capital is constant.

(10 Marks)

Question 3

ABC Ltd. wishes to raise additional finance of ₹20 lakhs for meeting its investment purpose. The company has ₹4,00,000 in the form of retained earnings available for investment purposes. The following are the further details:

Debt equity ratio	:	25 : 75
Cost of debt:		
Upto ₹2,00,000	:	10% (before tax) and

Beyond ₹2,00,000	:	13% (before tax)
Earning per share	:	₹12 per share
Dividend payout	:	50% of earnings
Expected growth rate	:	10%
Current market price	:	₹60 per share
Company's tax rate	:	30%
Shareholder's personal tax rate	:	20%.

Required:

(i) Calculate the post tax average cost of additional debt.
(ii) Calculate the cost of retained earnings and cost of equity.
(iii) Calculate the overall weighted average (after tax) cost of additional finance.

(10 Marks)

Question 4

A company issues:

- 15% convertible debentures of ₹100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk-free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of ₹12.76 per share. Five year ago, it paid dividend of ₹10 per share. Flotation cost is 5% of issue amount.

- 5% preference shares of ₹100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.

Assuming corporate tax rate is 40%.

(a) Calculate the cost of convertible debentures using the approximation method.
(b) Use YTM method to calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.03,t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.05,t}$	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.03,t}$	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.05,t}$	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
$FVIF_{i,5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
$FVIF_{i,6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
$FVIF_{i,7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

(10 Marks)

SOLUTION TEST 8

Solution 1

(i) Calculation of Weighted Average Cost of Capital

WACC (K_o) = $K_eW_e + K_pW_p + K_dW_d$

= $15.09\% \times \frac{10}{20} + 10\% \times \frac{4}{20} + 6\% \times \frac{6}{20}$ = 11.35%

K_e = $\frac{D_1}{P_0} + g$ = $\frac{10}{110} + .06$ = 15.09%

K_p = Rate of preferential dividend [FV = NP] = 10%

K_d = I (1 - t) = 12% (1 – 0.50) = 6%

(ii) Calculation of Revised WACC

Revised WACC (K_o) = $K_eW_e + K_pW_p + K_dW_d + K_{TL}W_{TL}$

= $17.43\% \times \frac{10}{30} + 10\% \times \frac{4}{30} + 6\% \times \frac{6}{30} + 7\% \times \frac{10}{30}$ = 10.68%

Revised K_e = $\frac{D_1}{P_0} + g$ = $\frac{12}{105} + .06$ = 17.43%

K_{TL} = I (1 - t) = 14% (1 – 0.50) = 7%

Solution 2

Assumption: The present capital structure is optimum. Hence, it will be followed in future.

Existing Capital Structure Analysis

Name of source	Amount (₹)	Proportion
13% debentures	3,60,000	0.15
11% Preference	1,20,000	0.05
Equity share capital	19,20,000	0.80
Total	24,00,000	1.00

(i) (a) After tax cost of new debt

K_d = $\frac{I(1-t)}{NP} \times 100$ = $\frac{14(1-.50)}{98} \times 100$ = 7.143%

After tax cost of new preference shares

K_p = $\frac{PD}{NP} \times 100$ = $\frac{1.20}{9.80} \times 100$ = 12.25%

(b) Cost of new equity (comes from retained earnings)

K_e = $\frac{D_1}{P_0(old)} + g$ = $\frac{1.3865}{27.75} + 0.12$ = 17%

(ii) MCC (K_o) = $K_dW_d + K_pW_p + K_eW_e$

= $7.143\% \times .15 + 12.245\% \times .05 + 17\% \times .80$ = 15.28%

(iii) The company can pay the following amount without selling the new shares:

Equity (retained earnings in this case) = 80% of the total capital

Therefore, investment before new issue = $\frac{2,77,300}{80\%}$ = ₹3,46,625

Retained earnings = ₹1.3865 × 2,00,000 = ₹2,77,300

(iv) MCC (K_o)

= $K_dW_d + K_pW_p + K_eW_e$

= $7.143\% \times .15 + 12.245\% \times .05 + 18.93\% \times .80$ = 16.83%

If the company pay more than ₹3,46,625, it will have to issue new shares. The cost of new issue of ordinary share is:

$K_e = \frac{D_1}{P_0(new)} + g = \frac{1.3865}{20} + 0.12$ = 18.93%

Solution 3

Total capital required is ₹20 lakhs. With a debt-equity ratio of 1:3. It means ₹5 lakhs is to be raised through debt and ₹15 lakhs through equity. Out of ₹15 lakhs, ₹4 lakhs are available in the form of retained earnings hence ₹11 lakhs will have to raise by issuing equity shares.

(i) Post tax average cost of additional debt:

K_{d1} = I (1 - t) = 10% (1 – 0.30) = 7%

K_{d2} = I (1 - t) = 13% (1 – 0.30) = 9.10%

Average K_d = $K_{d1}W_{d1} + K_{d2}W_{d2}$ = $7\% \times \frac{2}{5} + 9.10\% \times \frac{3}{5}$ = 8.26%

(ii) Cost of retained earning & cost of equity:

$K_e = \frac{D_1}{P_0} + g = \frac{6+10\%}{60} + 0.10$ = 21%

K_r = K_e (1-PT) = 21% (1 - .20) = 16.80%

D_0 = ₹12 × 50% = ₹6

(iii) Overall cost of additional finance:

K_o = $K_eW_e + K_rW_r + K_dW_d$

= $21\% \times \frac{11}{20} + 16.80\% \times \frac{4}{20} + 8.26\% \times \frac{5}{20}$ = 16.98%

Assumption: DPS is treated at D_o.

Solution 4

(a) Calculation of cost of Convertible Debentures using Approximation method:

$$K_d = \frac{I(1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100 = \frac{15(1-0.40)+\frac{130.58-95}{6}}{\frac{130.58+95}{2}} \times 100$$

$$= 13.24\%$$

Working Notes:

Determination of Redemption value:

Higher of

(i) The cash value of debentures = ₹100

(ii) Value of equity shares = 2 shares × ₹48.72 $(1 + 0.05)^6$ = ₹130.58

₹130 will be taken as redemption value as it is higher than the cash option and attractive to the investors.

Calculation of Value of Share today:

$$P_0 = \frac{D_1}{K_e - g} = \frac{12.76(1+0.05)}{32.50\% - 5\%} = ₹48.72$$

$$K_e = R_f + \beta (R_m - R_f) = 10\% + 1.25 \times 18\% = 32.50\%$$

$$g = \sqrt[5]{\frac{12.76}{10.00}} = 5\% \text{ or}$$

g = 12.76 ÷ 10.00 = 1.276 (5% for 5 year; given in interest rate table)

(b) Calculation of Cost of Preference shares using YTM method::

Calculation of NPV at two discount rates:

Year	Cash Flow	Present Value		Present Value	
		3%	DCF	5%	DCF
0	103.40	1.000	(103.40)	1.000	(103.40)
1 - 10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
NPV			+13.65		-3.39

$$IRR/K_d = LR + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L) = 3\% + \frac{13.65}{13.65 - (-3.39)} \times (5\% - 3\%)$$

$$= 4.60\%$$

Working Note:

Net Proceeds = Issue Price – Flotation Cost

= (100 + 10% Premium) – 6% = ₹103.40

TEST 9 – CAPITAL STRUCTURE

Question 1

X Ltd. and Y Ltd. are identical except that the former uses debt while the latter does not. Thus levered firm has issued 10% Debentures of ₹9,00,000. Both the firms earn EBIT of 20% on total assets of ₹15,00,000. Assuming tax rate is 50% and capitalization rate is 15% for an all equity firm.

(i) Compute the value of the two firms using NI approach.
(ii) Compute the value of the two firms using NOI approach.
(iii) Calculate the overall cost of capital, K_o for both the firms using NOI approach.

(10 Marks)

Question 2

Alpha Limited and Beta Limited are identical except for capital structures. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 per cent equity. (All percentages are in market value terms). The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) (i) If you own 2 per cent of the shares of Alpha Ltd., determine your return if the company has net operating income of ₹3,60,000 and the overall capitalisation rate of the company, K_o is 18 per cent?

(ii) Calculate the implied required rate of return on equity?

(b) Beta Ltd. has the same net operating income as Alpha Ltd. (i) Determine the implied required equity return of Beta Ltd.? (ii) Analyse why does it differ from that of Alpha Ltd.?

(10 Marks)

Question 3

RST Ltd. is expecting an EBIT of ₹4,00,000 for F.Y. 2015-16. Presently the company is financed by equity share capital ₹20,00,000 with equity capitalization rate of 16%. The company is contemplating to redeem part of the capital by introducing debt financing. The company has two options to raise debt to the extent of 30% or 50% of the total fund. It is expected that for debt financing upto 30%, the rate of interest will be 10% and equity capitalization rate will increase to 17%. If the company opts for 50% debt, then the interest rate will be 12% and equity capitalization rate will be 20%.

You are required to compute value of the company; its overall cost of capital under different options and also state which is the best option.

(10 Marks)

Question 4

The following data relate to two companies belonging to the same risk class:

	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.

(10 Marks)

SOLUTION TEST 9

Solution 1

(i) Calculation of Value of firms by NI Approach:

Particulars	X Ltd (₹)	Y Ltd (₹)
EBIT (20% of ₹15,00,000)	3,00,000	3,00,000
Less: Interest on Debt	90,000	-
Profit Before Tax	2,10,000	3,00,000
Less: Tax @ 50%	1,05,000	1,50,000
Profit After Tax	1,05,000	1,50,000
Equity Capitalization rate	15%	15%
Market Value of Equity (PAT ÷ K_e)	7,00,000	10,00,000
Value of debt	9,00,000	-
Total Value of the Firm	16,00,000	10,00,000

(ii) Values of the firm as per NOI Approach:

Value of unlevered firm (Y Ltd) = $\frac{EBIT(1-t)}{K_o}$ = $\frac{3,00,000\ (1-0.30)}{0.15}$

= ₹10,00,000

Value of levered firm (X Ltd) = Value of unlevered firm + Debt × tax

= ₹10,00,000 + 9,00,000 × 50% = ₹14,50,000

This value of ₹14,50,000 can be bifurcated into Debt of ₹9,00,000 and Equity of ₹5,50,000.

(iii) Calculation of K_o under NOI Approach:

Y Ltd (K_o) = K_e = 15%

X Ltd (K_o) = $K_e W_e + K_d W_d$

= $19.1\% \times \frac{5,50,000}{14,50,000} + 5\% \times \frac{9,00,000}{14,50,000}$ = 10.34%

Or

X Ltd (K_o) = $\frac{EBIT(1\quad t)}{V} \times 100$

= $\frac{3,00,000(1-0.50)}{14,50,000} \times 100$ = 10.34%

Working Notes:

Calculation of K_e of X Ltd:

K_e = $\frac{\text{Earning for Equity}}{\text{Market value of Equity}} \times 100$

= $\frac{(3,00,000-90,000)\ (1-0.50)}{5,50,000} \times 100$ = 19.10%

Solution 2

(a) Value of the Alpha Ltd. = $\frac{NOI}{K_o}$ = $\frac{3,60,000}{18\%}$ = ₹20,00,000

Value of Shares of Alpha Ltd. = 50% of ₹20,00,000 = ₹10,00,000

(i) Return on Shares on Alpha Ltd

Particulars	₹
Net Operating income	3,60,000
Less: Interest on Debt @ 8% on ₹10,00,0,00 (50% of ₹20,00,000)	80,000
Earnings for Equity Investors	2,80,000
Return on 2% Shares (2% of ₹2,80,000)	5,600

(ii) Implied required rate of return on Equity = $\frac{2,80,000}{10,00,000} \times 100$ = 28%

(b) (i) Return on Shares on Beta Ltd

Particulars	₹
Net Operating income	3,60,000
Less: Interest on Debt @ 8% on ₹4,00,0,00 (20% of ₹20,00,000)	32,000
Earnings for Equity Investors	3,28,000

Value of Shares of Beta Ltd. = 80% of ₹20,00,000 = ₹16,00,000

Implied required rate of return on Equity = $\frac{3,28,000}{16,00,000} \times 100$ = 20.50%

(ii) It is lower than the Alpha Ltd. because Beta Ltd. uses less debt in its capital structure. As the equity capitalisation is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds.

Solution 3

Statement of Value of Firm and Cost of Capital

Particulars	All equity	30% Debt	50% Debt
Earnings before interest and tax	4,00,000	4,00,000	4,00,000
Less: Interest @ 10% of ₹6,00,000 or	-	60,000	-
@ 12% of ₹10,00,000	-	-	1,20,000
Earning available for Equity	4,00,000	3,40,000	2,80,000
÷ K_e	16%	17%	20%
Value of Equity (E) [PBT ÷ K_e]	25,00,000	20,00,000	14,00,000
Value of Debt (D)	-	6,00,000	10,00,000
Value of Firm (V)	25,00,000	26,00,000	24,00,000
K_o (EBIT ÷ V)	16%	15.38%	16.67%

Decision: Company should opt for 30% debt finance having higher Value of firm and lower K_o.

Solution 4

(a) Various calculation without tax:

Market Value of firms:

Market Value of B Ltd. (V_{UL}) = EBIT ÷ K_e
= ₹18,00,000 ÷ 18% = ₹1,00,00,000

Market Value of A Ltd. (V_L) = Value of unlevered = ₹1,00,00,000

Equity Capitalization Rate:

Equity Capitalization Rate (B Ltd.) = 18% (given in the question)

Equity Capitalization Rate (A Ltd.) = (EBIT – I) ÷ *E (Value of Equity)
= (₹18,00,000 – 12% × ₹54,00,000) ÷ ₹46,00,000
= 25.04%

*Value of Equity (E) of A Ltd. = Value of Firm – Debt
= ₹1,00,00,000 - ₹54,00,000 = ₹46,00,000

Weighted Average Cost of Capital:

Weighted Average Cost of Capital (B Ltd.) = K_e = K_o = 18%

Weighted Average Cost of Capital (A Ltd.) = EBIT ÷ V (Value of Firm)
= ₹18,00,000 ÷ ₹1,00,00,000 = 18%

(b) Various calculation with tax:

Market Value of firms:

Market Value of B Ltd. (V_{UL}) = EBIT (1 - t) ÷ K_e or K_o
= ₹18,00,000 (1 – 0.40) ÷ 18% = ₹60,00,000

Market Value of A Ltd. (V_L) = Value of unlevered + Debt × Tax
= ₹60,00,000 + ₹54,00,000 × .4 = ₹81,60,000

Equity Capitalization Rate:

Equity Capitalization Rate (B Ltd.) = 18% (given in the question)

Equity Capitalization Rate (A Ltd.) = (EBIT – I) (1 - t) ÷ *E (Value of Equity)
= (₹18,00,000 – 12% × ₹54,00,000) (1 – .4) ÷ ₹27,60,000
= 25.04%

*Value of Equity (E) of A Ltd. = Value of Firm – Debt
= ₹81,60,000 - ₹54,00,000 = ₹27,60,000

Weighted Average Cost of Capital:

Weighted Average Cost of Capital (B Ltd.) = K_e = K_o = 18%

Weighted Average Cost of Capital (A Ltd.) = EBIT (1 - t) ÷ V (Value of Firm)
= ₹18,00,000 (1 – 0.4) ÷ ₹81,60,000
= 13.24%

TEST 10 – DEVIDEND DECISIONS

Question 1

AB Engineering ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at ₹100 each. The firm is contemplating the declaration of a dividend of ₹5 per share at the end of the current financial year. It expects to have a net income of ₹1,00,000 and has a proposal for making new investments of ₹2,00,000.

Required:

1. Calculate value of firm when dividends are not paid.
2. Calculate value of firm when dividends are paid.

(10 Marks)

Question 2

The following information is supplied to you:

Total Earnings	₹2,00,000
No. of equity shares (of ₹100 each)	20,000
Dividend paid	₹1,50,000
Price/Earnings ratio	12.5

Applying Walter's Model:

1. Ascertain whether the company is following an optimal dividend policy.
2. Find out what should be the P/E ratio at which the dividend policy will have no effect on the value of the share.
3. Will your decision change, if the P/E ratio is 8 instead of 12.5?

(10 Marks)

Question 3

With the help of following figures calculate the market price of a share of a company by using:

1. Walter's formula
2. Dividend growth model (Gordon's formula)

Earning per share (EPS)	₹10
Dividend per share (DPS)	₹6
Cost of capital (k)	20%
Internal rate of return on investment	25%
Retention Ratio	40%

(5 Marks)

Question 4

The dividend payout ratio of H Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, what will be the P/E ratio.

(5 Marks)

SOLUTION TEST 10

Solution 1

1. Value of the firm when dividends are not paid:

Step 1: Calculate price at the end of the period:

Ke = 10%, P_0 = ₹100, D_1 = 0

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

$₹100 = \frac{P_1+0}{1+0.10}$ or P_1 = ₹110

Step 2: No. of shares required to be issued:

No. of shares $\Delta n = \frac{\text{Funds requied} - (E-D)}{\text{Price at end}(P_1)} = \frac{2,00,000-(1,00,000-0)}{110}$

= 909.09 shares

Step 3: Calculation of value of firm:

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

$nP_o = \frac{(10,000+909.09)110-2,00,000+1,00,000}{(1+.10)}$ = ₹10,00,000

2. Value of the firm when dividends are paid:

Step 1: Calculate price at the end of the period:

Ke = 10%, P_0 = ₹100, D_1 = ₹5

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

$₹100 = \frac{P_1+5}{1+0.10}$ or P_1 = ₹105

Step 2: No. of shares required to be issued:

No. of shares $\Delta n = \frac{\text{Funds requied} - (E-D)}{\text{Price at end}(P_1)} = \frac{2,00,000-(1,00,000-50,000)}{105}$

= 1,428.57 shares

Step 3: Calculation of value of firm:

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

$nP_o = \frac{(10,000+1,428.57)105-2,00,000+1,00,000}{(1+.10)}$ = ₹10,00,000

Thus, it can be seen that the value of the firm remains the same in either case.

Solution 3

1. $K_e = \frac{1}{PE} = \frac{1}{12.5} = 8\%$

   $r = \frac{\text{Total Earnings}}{\text{Total Funds}} \times 100 = \frac{2,00,000}{20,000 \text{ Shares} \times 100 \text{ per share}} \times 100 = 10\%$

   $r > K_e$, Therefore as per Walter model optimum dividend payout is Nil and company is paying dividend to shareholders means company is not following optimum dividend policy.

2. The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the k_e would be equal to the rate of return (r) of the firm.

   $K_e = r = 10\%$

   $PE = \frac{1}{Ke} = \frac{1}{.10} = 10 \text{ times}$

3. If the P/E is 8 instead of 12.5, then the K_e which is the inverse of P/E ratio, would be 12.5:

   $K_e = \frac{1}{PE} = \frac{1}{8} = 12.5\%$

   In such a situation $K_e > r$ and optimum dividend payout will be 100%.

Solution 3

1. Walter's formula:

   $P = \frac{D + (E-D) \times \frac{r}{K_e}}{K_e} = \frac{6 + (10-6) \times \frac{0.25}{0.20}}{0.20} = ₹55$

2. Gordon's formula (Dividend Growth model):

   $P_o = \frac{D_1}{K_e - g} = \frac{6}{0.20-0.10} = ₹60$

   $G = b \times r = 25\% \times .4 = 10\%$

Solution 4

Since the dividend payout ratio is 40%

$D = 40\% \text{ of } E \text{ i.e. } 0.4E$

$P = M (D + E/3) = 9 (D + E/3) = 9 (0.4E + E/3)$

$P = 9 (0.4E + E/3) = 9 \left(\frac{1.2E+E}{3}\right) = 3 (2.2E) = 6.6E$

$P/E \text{ ratio} = \frac{MPS}{EPS} = \frac{P}{E} = \frac{6.6E}{E} = 6.6 \text{times}$

SAMPLE PAPER 1

Question 1 (a)

A factoring firm has offered a to buy it's accounts receivables. The relevant information is given below.

(i) The current average collection period for the company's debts is 80 days and ½% of debtors default. The factor has agreed to pay over money due, to the company after 60 days, and it will suffer losses of any bad debts also.

(ii) Factor will charge commission @2%.

(iii) The company spends ₹1,00,000 p.a. on administration of debtor. These are avoidable cost.

(iv) Annual credit sales are ₹90,00,000. Total variable costs is 80% of sales. The company's cost of borrowings is 15% per annum. Assume 365 days in a year.

Should the company enter into a factoring agreement?

(5 Marks)

Question 1 (b)

Book value of capital structure of B Ltd. is as follows:

Sources	Amount
12% 6,000 Debentures @ ₹100 each	₹6,00,000
Retained earnings	₹4,50,000
4,500 Equity shares @ ₹100 each	₹4,50,000
	₹15,00,000

Currently the market value of debenture is ₹110 per debenture and equity share is ₹180 per share. The expected rate of return to equity shareholder is 24% p.a. Company is paying tax @30%.

Calculate WACC on the basis of market value weights.

(5 Marks)

Question 1 (c)

X Ltd. is a manufacturing company. Current market price per share is ₹2,185. During the F.Y. 2020-21, the company paid ₹140 as dividend per share. The company is expected to grow @12% p.a. for next four years, then 5% p.a. for an indefinite period. Expected rate of return of shareholders is 18% p.a.

(i) Find out intrinsic value per share.
(ii) State whether shares are overpriced or underpriced.

Year	1	2	3	4	5
Discounting Factor@18%	0.847	0.718	0.608	0.515	0.436

(5 Marks)

Question 1 (d)

A garment trader is preparing cash forecast for first three months of calendar year 2021. His estimated sales for the forecasted periods are as below:

	January (₹ '000)	February (₹ '000)	March (₹ '000)
Total sales	600	600	800

(i) The trader sells directly to public against cash payments and to other entities on credit. Credit sales are expected to be four times the value of direct sales to public. He expects 15% customers to pay in the month in which credit sales are made, 25% to pay in the next month and 58% to pay in the next to next month. The outstanding balance is expected to be written off.

(ii) Purchase of goods are made in the month prior to sales and it amounts to 90% of sales and are made on credit. Payments of these occur in the month after the purchase. No inventories of goods held.

(iii) Cash balance as on 1st January, 2021 is ₹50,000.

(iv) Actual sales for the last two months of calendar year 2020 are as below:

	November (₹ '000)	December (₹ '000)
Total sales	640	880

You are required to prepare a monthly cash budget for the three months from January to March, 2021.

(5 Marks)

Question 2

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

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

Balance Sheet

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

Required:

Complete the Balance Sheet of ABC Industries as on 31st March, 2021.

All calculations should be in nearest rupee. Assume 360 days in a year.

(10 Marks)

Question 3

Earnings before interest and tax of a company are ₹4,50,000. Currently the company has 80,000 equity shares of ₹10 each, retained earnings of ₹12,00,000. It pays annual interest of ₹1,20,000 on 12% Debentures. The company proposes to take up an expansion scheme for which it needs additional fund of ₹6,00,000. It is anticipated that after expansion, the company will be able to achieve the same rate of return on investment as at present. It can raise fund either through debts at rate of 12% p.a. or by issuing Equity shares at par. Tax rate is 40%.

Required:

Compute the earning per share if:

(a) The additional funds were raised through debt.

(b) The additional funds were raised by issue of Equity shares.

Advise whether the company should go for expansion plan and which sources of finance should be preferred.
(10 Marks)

Question 4

Information of A Ltd. is given below:

- Earnings after tax : 5% of sales
- Income tax rate : 50%
- Degree of Operating leverage : 4 times
- 10% Debenture in capital structure : ₹3 lakhs
- Variable costs : ₹6 lakhs

Required:

(i) From the given data complete following statement:

Sales	XXXX
Less: Variable Costs	₹6,00,000
Contribution	XXXX
Less: Fixed costs	XXXX
EBIT	XXXX
Less: Interest expenses	XXXX
EBT	XXXX
Less: Income tax	XXXX
EAT	XXXX

(ii) Calculate Financial Leverage and Combined Leverage.
(iii) Calculate percentage change in earning per share, if sales increased by 5%.

(10 Marks)

SOLUTION SAMPLE PAPER 1

Solution 1 (a)

Statement of Evaluation

Particulars	₹
(A) Savings:	
Saving in administration cost	1,00,000
Saving in bad debts (0.5% of 90,00,000)	45,000
*Saving in cost of debtors (90,00,000 × 80% × $^{80-60}/_{365}$ × 15%)	59178
Total (A)	2,04,178
(B) Cost:	
Annual charges (2% of 90,00,000)	1,80,000
Total (B)	1,80,000
Net Benefit (A - B)	24,178

*Presently, the debtors of the company pay after 80 days. However, the factor has agreed to pay after 60 days only. So, the investment in Debtors will be reduced by 20 days.

Conclusion: Yes, company should enter into factoring agreement.

Solution 1 (b)

Statement of WACC (Market Value Weights)

Capital Structure	Amount	Weight	Specific Cost	Cost of Capital
12% Debentures	6,60,000	0.449	0.0764	0.0343
Equity Fund including Retained earning	8,10,000	0.551	0.1333	0.0734
Total	14,70,000	1.000	WACC	0.1077

WACC (K_o) = 0.1077 or 10.77%

Working Notes:

(1) Calculation of Market Value:

Market value of debenture = (₹6,00,000 ÷ ₹100) × ₹110 = ₹6,60,000

Market value of Equity and Retained earnings:

= (₹4,50,000 ÷ ₹100) × ₹180 = ₹8,10,000

(2) Calculation of K_e:

$$K_e = \frac{D_1}{P_0} \times 100 = \frac{24\% \text{ of } 100}{180} = 13.33\%$$

(3) Calculation of K_d:

$$K_d = \frac{I(1-t)}{NP} \times 100 = \frac{12\% \text{ of } 100\,(1-0.3)}{110} \times 100 = 7.64\%$$

Solution 1 (c)

(i) Calculation of Intrinsic Value of Share

Year	Expected benefits	PVF @ 18%	DCF
1	140.00 + 12% = ₹156.80	0.847	132.81
2	156.80 + 12% = ₹175.62	0.718	126.10
3	175.62 + 12% = ₹196.69	0.608	119.59

4 (5 to ∞)	196.69 + 12% = ₹220.29 P_4 = ₹1,779.27	0.515 0.515	113.45 916.32
Present value of all future benefits or Intrinsic value of Share			₹1,408.27

$$P_4 = \frac{D_5}{K_e - g} = \frac{220.29 + 5\%}{18\% - 5\%} = ₹1,779.27$$

(ii) Intrinsic value of share is ₹1,408.27 as compared to latest market price of ₹2,185. Market price of a share is overpriced by ₹776.73.

Solution 1 (d)

Cash Budget
(From January to March, 2021)

Particulars	January	February	March
Opening Balance	50,000	1,74,960	3,55,280
Cash Sales & Debtors Collection	6,64,960	7,20,320	6,54,400
Total A	7,14,960	8,95,280	10,09,680
Payments to creditors (90% of sales)	5,40,000	5,40,000	7,20,000
Total B	5,40,000	5,40,000	7,20,000
Closing balance (A - B)	1,74,960	3,55,280	2,89,680

Working Note: Cash Sales and Collection from Debtors:

(₹ '000)

Month	Sales	Cash Sales 20%	Credit Sales 80%	From Debtors			Total Collection
				15%	25%	58%	
November	640	128	512	76.8	-	-	-
December	880	176	704	105.6	128	-	-
January	600	120	480	72	176	296.96	664.96
February	600	120	480	72	120	408.32	720.32
March	800	160	640	96	120	278.4	654.4

Solution 2

Balance Sheet

Liabilities	₹	Assets	₹
Equity Share Capital	20,00,000	Fixed Assets	30,32,222
Reserves & surplus	10,00,000	Inventory	9,77,778
Long-term debts	9,00,000	Accounts receivables	8,00,000
Accounts payable	11,00,000	Cash	1,90,000
Total	50,00,000	Total	50,00,000

Working Notes:

1. Inventory = $\text{COGS} \times \frac{\text{Inventory holding period}}{360}$
   = ₹64,00,000 × 55/360 = ₹9,77,778

2. Sales = COGS ÷ COGS ratio
   = ₹64,00,000 ÷ 80% (100 – G.P. ratio) = ₹80,00,000

3. Debtors = $\text{Sales} \times \frac{\text{Account receivable s period}}{360}$
   = ₹80,00,000 × 36/360 = ₹8,00,000

4. Debt:

Debt to Total asset	=	$\frac{\text{Debt (Long – term debt + Accounts payables)}}{\text{Total Asset}}$	=	40%
Debt	=	40% of Total Assets		
	=	₹50,00,000 × 40%	=	₹20,00,000

Note: In debt we are considering total debt i.e. Long-term debt and Accounts payables.

5. Equity Fund	=	Equity Share Capital + Reserve and surplus		
	=	Total Liabilities – Debt		
	=	₹50,00,000 – ₹20,00,000	=	₹30,00,000
Reserve and surplus	=	Equity fund – Equity share capital		
	=	₹30,00,000 – ₹20,00,000	=	₹10,00,000
6. Long-term debt:				
Long-term debt to equity=		$\frac{\text{Long – term debt}}{\text{Equity}}$	=	30%
Long-term debt	=	30% of Equity		
	=	30% of ₹30,00,000	=	₹9,00,000
Accounts payables	=	Debt – Long-term debt		
	=	₹20,00,000 – ₹9,00,000	=	₹11,00,000
7. Quick Ratio	=	$\frac{\text{Current assets – Inventories}}{\text{Current liabilities}}$	=	0.9
Current assets – ₹9,77,778	=	0.9 × ₹11,00,000		
Current Assets	=	₹9,90,000 + ₹9,77,778	=	₹19,67,778
Cash	=	Current assets – Inventories – Accounts receivables		
	=	₹19,67,778 - ₹9,77,778 - ₹8,00,000	=	₹1,90,000
8. Fixed assets	=	Total assets – Current assets		
	=	₹50,00,000 – ₹19,67,778	=	₹30,32,222

Solution 3

Statement of EPS

Particulars	Alternatives	
	Debt Plan (i)	Equity Plan (ii)
Earnings before interest and tax @ 15% of ₹36,00,000	5,40,000	5,40,000
Less: Interest:		
Existing	1,20,000	1,20,000
New (12% on ₹6,00,000)	72,000	-
EBT	3,48,000	4,20,000
Less: Tax @ 40%	1,39,200	1,68,000
EAT	2,08,800	2,52,000
÷ No. of Equity shares		
Existing	80,000	80,000
New	-	60,000
EPS	₹2.61	₹1.80

Advise to the company: Since EPS after expansion under debt plan is higher (₹2.61) than Existing EPS (₹2.475), company should go for expansion plan and choose debt source of finance.

EPS before expansion = $\frac{(EBIT - I)(1 - T)}{N}$ = $\frac{(4,50,000 - 1,20,000)(1 - 0.4)}{80,000}$ = ₹2.475

Working notes:

1. Calculation of capital employed before expansion plan:

Equity share capital (80,000 shares × ₹10)	₹8,00,000
Retained earnings	₹12,00,000
Debentures (₹1,20,000/12%)	₹10,00,000
Total capital employed	₹30,00,000

2. Return on capital employed (ROCE) or Return on Investment:

ROCE = $\frac{EBIT}{Capital\ Employed} \times 100$ = $\frac{4,50,000}{30,00,000} \times 100$ = 15%

3. Capital employed after expansion = ₹36,00,000 (₹30,00,000 + ₹6,00,000)

Solution 4

(i) Statement of EAT

Particulars	₹
Sales	12,00,000
Less: Variable Costs	6,00,000
Contribution	6,00,000
Less: Fixed costs	4,50,000
EBIT	1,50,000
Less: Interest expenses @ 10% of ₹3 lakhs	30,000
EBT	1,20,000
Less: Income tax	60,000
EAT @5% of ₹12,00,000	₹60,000

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

Combined Leverage = OL × FL = 4 × 1.25 = 5 times

(iii) % change in EPS = % change in Sales × CL = 5% × 5 = 25% Increased

Working Notes:

(a) Operating Leverage = $\frac{Contribution}{EBIT}$ = $\frac{Contribution}{Contribution - Fixed\ cost}$ = 4

Contribution = 4 Contribution – 4 Fixed cost
- 3 Contribution = - 4 Fixed cost
¾ Contribution = Fixed cost

Contribution = Sales – Variable cost = Sales – ₹6,00,000

∴ Fixed cost = ¾ or 75% of contribution = 75% (Sales - ₹6,00,000)
= 75% Sales - ₹4,50,000

(b) EAT = 5% of Sales
EBT = EAT ÷ (1 - t) = 5% Sales ÷ (1 – 0.5)
= 10% Sales

(c)	EBT	=	Sales – Variable cost – Fixed cost – Interest		
	10% Sales	=	Sales - ₹6,00,000 – (75% Sales - ₹4,50,000) - ₹30,000		
	10% Sales	=	Sales - ₹6,00,000 – 75% Sales + ₹4,50,000 - ₹30,000		
	10% Sales	=	25% Sales - ₹1,80,000		
	15% Sales	=	₹1,80,000		
	Sales	=	₹1,80,000 ÷ 15%	=	₹12,00,000
(d)	EBT	=	10% of Sales	=	10% of ₹12,00,000
		=	₹1,20,000		
(e)	EBIT	=	EBT + Interest	=	₹1,20,000 + ₹30,000
		=	₹1,50,000		
(f)	Fixed cost	=	75% of Contribution	=	75% of ₹6,00,000
		=	₹4,50,000		

SAMPLE PAPER 2

Question 1 (a)

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

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

You are required to calculate:

(1) Shareholders' Fund
(2) Stock
(3) Debtors
(4) Current Liabilities
(5) Cash Balance

(5 Marks)

Question 1 (b)

Balance sheet of X Ltd for the year ended 31st March, 2022 is given below:

(₹ in lakhs)

Liabilities	Amount	Assets	Amount
Equity Shares ₹10 each	200	Fixed Assets	500
Retained Earnings	200	Raw Materials	150
11% Debentures	300	WIP	100
Public Deposits (Short-term)	100	Finished Goods	50
Trade Creditors	80	Debtors	125
Bills Payable	100	Cash and Bank	55
	980		980

Calculate the amount of maximum permissible bank finance under three methods as per Tandon Committee lending norms.

Total core current assets are assumed to be ₹30 Lakhs.

(5 Marks)

Question 2

Details of a company for the year ended 31st March, 2022 are given below:

Sales	:	₹86,00,000
Profit Volume (P/V) Ratio	:	35%
Fixed Cost excluding interest expense	:	₹10,00,000
10% Debt	:	₹55,00,000
Equity Share Capital of ₹10 each	:	₹75,00,000
Income Tax Rate	:	40%

Required:
(1) Determine company's Return on Capital Employed (Pre-tax) and EPS.

(2) Does the company have a favourable financial leverage?
(3) Calculate operating and combined leverage of the company.
(4) Calculate percentage change in EBIT, if sales increases by 10%
(5) At what level of sales, the Earning before tax (EBT) of the company will be equal to zero?

(10 Marks)

Question 3

Alpha Limited is a manufacturer of computers. It wants to introduce artificial intelligence while making computers. The estimated annual saving from introduction of the artificial intelligence (AI) is as follows:

- Reduction of five employees with annual salaries of ₹3,00,000 each
- Reduction of ₹3,00,000 in production delays caused by inventory problem.
- Reduction in lost sales ₹2,50,000 and
- Gain due to timely billing ₹2,00,000

The purchase price of the system for installation of artificial intelligence is ₹20,00,000 and installation cost is ₹1,00,000. 80% of the purchase price will be paid in the year of purchase and remaining will be paid in next year.

The estimated life of the system is 5 years and it will be depreciated on a straight-line basis. However, the operation of the new system requires two computer specialists with annual salaries of ₹5,00,000 per person. In addition to above, annual maintenance and operating cost for five years are as below:

(Amount in ₹)

Year	1	2	3	4	5
Maintenance & Operating Cost	2,00,000	1,80,000	1,60,000	1,40,000	1,20,000

Maintenance and operating cost are payable in advance. The company's tax rate is 30% and its required rate of return is 15%.

Year	1	2	3	4	5
$PVIF_{0.10,t}$	0.909	0.826	0.751	0.683	0.621
$PVIF_{0.12,t}$	0.893	0.797	0.712	0.636	0.567
$PVIF_{0.15,t}$	0.870	0.756	0.658	0.572	0.497

Evaluate the project by using Net Present Value and Profitability Index.

(10 Marks)

Question 4

The particulars related to Raj Ltd. for the year ended 31st March, 2022 are given as follows:

Output (units at normal capacity)	1,00,000
Selling price per unit	₹40
Variable cost per unit	₹20
Fixed cost	₹10,00,000

The capital structure of the company as on 31st March, 2022 is as follows:

Particulars	₹
Equity Share Capital (1,00,000 shares of ₹10 each) Reserves and Surplus	10,00,000
	5,00,000
Current Liabilities	5,00,000
Total	20,00,000

Raj Ltd. has decided to undertake an expansion project to use the market potential that will involve ₹20,00,000. The company expects an increase in output by 50%. Fixed cost will be increased by ₹5,00,000 and variable

cost per unit will be increased by 15%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion program are planned:

Alternative	Debt	Equity Shares
1	₹5,00,000	Balance
2	₹10,00,000	Balance
3	₹14,00,000	Balance

Slab wise interest rate for fund borrowed is as given follows:

Fund Limit	Applicable Interest Rate
Upto ₹5,00,000	10%
Over ₹5,00,000 and upto ₹10,00,000	15%
Over ₹10,00,000	20%

Current market price per share is 200.

Find out which of the above mentioned alternatives would you recommend for raj Ltd. with reference to the EPS, assuming a corporate tax rate is 40%?

(10 Marks)

Question 5

A company issues:

- 15% convertible debentures of ₹100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk-free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of ₹12.76 per share. Five year ago, it paid dividend of ₹10 per share. Flotation cost is 5% of issue amount.

- 5% preference shares of ₹100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.

Assuming corporate tax rate is 40%.

(a) Calculate the cost of convertible debentures using the approximation method.
(b) Use YTM method to calculate cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.03,t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.05,t}$	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.03,t}$	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.05,t}$	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
$FVIF_{i,5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
$FVIF_{i,6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
$FVIF_{i,7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

(10 Marks)

SOLUTION SAMPLE PAPER 2

Solution 1 (a)

(1)	Shareholders' Fund	=	Equity Share Capital + Reserve and Surplus		
		=	₹10 Lakhs + 0.50 Shareholders' Fund		
	0.50 Shareholders' Fund	=	₹10 Lakhs		
	Shareholders' Fund	=	₹10 Lakhs ÷ 0.50	=	₹20,00,000
	$\frac{\text{Reserve and Surplus}}{\text{Shareholders' Fund}}$	=	0.50 or Reserve & Surplus	=	0.50 Shareholders' Fund
(2)	Stock	=	COGS × Stock velocity/12		
		=	₹24,00,000 × 2/12	=	₹4,00,000
	$\frac{\text{Sales}}{\text{Shareholders' Fund}}$	=	1.50 or Sales	=	1.50 Shareholders' Fund
	Sales	=	1.50 × ₹20,00,000	=	₹30,00,000
	COGS	=	Sales – Gross Profit		
		=	₹30,00,000 – 20%	=	₹24,00,000
(3)	Debtors	=	Annual Credit Sales ÷ Debtors Turnover Ratio		
		=	₹30,00,000 ÷ 6	=	₹5,00,000
(4)	Current Liabilities:				
	Current Ratio	=	CA ÷ CL	=	2.50
	Current Asset	=	2.50 CL		
	$\frac{\text{Sales}}{\text{Net Working Capital}}$	=	2.50		
	Net Working Capital	=	Sales ÷ 2.50	=	₹30,00,000 ÷ 2.50
		=	₹12,00,000		
	CA – CL	=	₹12,00,000		
	2.5 CL – CL	=	₹12,00,000		
	Current Liabilities	=	₹12,00,000 ÷ 1.5	=	₹8,00,000
(5)	Cash Balance	=	Current Asset – Debtors – Stock		
		=	₹20,00,000 - ₹5,00,000 - ₹4,00,000		
		=	₹11,00,000		
	Current Asset	=	2.5 CL		
		=	2.5 × 8,00,000	=	₹20,00,000

Solution 1 (b)

Calculation of MPBF:

Method 1	=	75% (CA - CL)	=	75% (480 – 280)	=	₹150 Lakhs
Method 2	=	(75% CA) – CL	=	(75% 480) – 280	=	₹80 lakhs

Method 3 = (75% CA other than core CA) – CL
= 75% (480 – 30) – 280 = ₹57.50 Lakhs

Current Assets = Raw Materials + WIP + Finished Goods + Debtors + Cash and Bank
= 150 + 100 + 50 + 125 + 55 = ₹480 Lakhs

Current Liabilities = Public deposit (Short term) + Trade Creditors + Bills Payable
= 100 + 80 + 100 = ₹280 Lakhs

Solution 2

(1) ROCE = $\frac{\text{EBIT}}{\text{Capital Employed}} \times 100 = \frac{20,10,000}{55,00,000 + 75,00,000} \times 100 =$ 15.46%

Statement of EPS

Particulars	₹
Sales	86,00,000
Less: Variable cost @ of 65% (100 – P/V ratio) of sales	55,90,000
Contribution	30,10,000
Less: Fixed costs	10,00,000
EBIT	20,10,000
Less: Interest @ 10% of 55,00,000	5,50,000
EBT	14,60,000
Less: Income Tax @ 40%	5,84,000
EAT	8,76,000
÷ Number of Equity Shares	÷ 7,50,000
EPS	1.168

(2) ROCE is 15.46% and Interest on debt is 10%, hence, it has a favourable financial leverage.

(3) Calculation of Operating and Combined leverages:

Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{30,10,000}{20,10,000} =$ 1.497

Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{30,10,000}{14,60,000} =$ 2.062

(4) Operating leverage is 1.497. So if sales is increased by 10% then EBIT will be increased by 1.497 × 10 i.e. 14.97% (approx.)

(5) EBT = Sales – Variable cost – Fixed cost – Interest
Nil = Sales – 65% sales – 10,00,000 – 5,50,000
35% of sales = 15,50,000
Sales = ₹44,28,571

Solution 3

(1) Net Present value (NPV)

Year	Particulars	₹	PVIF @ 15%	PV
0	Initial Outflows:			
	80% of Purchase price (20,00,000 × 80%)	(16,00,000)	1.000	(16,00,000)
	Installation cost	(1,00,000)	1.000	(1,00,000)
1	20% of Purchase Cost	(4,00,000)	0.870	(3,48,000)
	PV of Outflows			20,48,000
0	Maintenance & Operating cost for year 1	(2,00,000)	1.000	(2,00,000)
1	CFAT	8,81,000	0.870	7,66,470
2	CFAT	8,95,000	0.756	6,76,620

3	CFAT	9,09,000	0.658	5,98,122
4	CFAT	9,23,000	0.572	5,27,956
5	CFAT	10,37,000	0.497	5,15,389
PV of Inflows				28,84,557
NPV				8,36,557

Advice: Accept the proposal having positive NPV.

(2) Profitability Index = PV of Inflows ÷ PV of Outflows
= 28,84,557 ÷ 20,48,000 = 1.41

Advice: Accept the proposal having PI higher than 1.

Working Note:

Statement of CFAT

Particulars	1	2	3	4	5
Saving in employees salaries (₹3,00,000 × 5)	15,00,000	15,00,000	15,00,000	15,00,000	15,00,000
Add: Reduction in prod. delays	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000
Add: Reduction in lost sales	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000
Add: Gain due to timely billing	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
Less: Salaries computer specialist (₹5,00,000 × 2)	(10,00,000)	(10,00,000)	(10,00,000)	(10,00,000)	(10,00,000)
Less: Maintenance & Op. cost	(2,00,000)	(1,80,000)	(1,60,000)	(1,40,000)	(1,20,000)
Less: Depreciation (21,00,000 ÷ 5 years)	(4,20,000)	(4,20,000)	(4,20,000)	(4,20,000)	(4,20,000)
PBT	6,30,000	6,50,000	6,70,000	6,90,000	7,10,000
Less: Tax @ 30%	(1,89,000)	(1,95,000)	(2,01,000)	(2,07,000)	(2,13,000)
PAT	4,41,000	4,55,000	4,69,000	4,83,000	4,97,000
Add: Depreciation	4,20,000	4,20,000	4,20,000	4,20,000	4,20,000
Add: Maint. & Op. cost (accrual)	2,00,000	1,80,000	1,60,000	1,40,000	1,20,000
Less: Maint. & Op. cost (Cash)	(1,80,000)	(1,60,000)	(1,40,000)	(1,20,000)	-
CFAT	8,81,000	8,95,000	9,09,000	9,23,000	10,37,000

Solution 4

Statement of EPS

Particulars	Alternatives		
	1	2	3
Expected output in units (1,00,000 + 50%)	1,50,000	1,50,000	1,50,000
Sales @ ₹40 per unit	60,00,000	60,00,000	60,00,000
Less: Variable Cost @ ₹17 (₹20 - 15%) per unit	25,50,000	25,50,000	25,50,000
Contribution	34,50,000	34,50,000	34,50,000
Less: Fixed Cost (₹10,00,000 + ₹5,00,000)	15,00,000	15,00,000	15,00,000
Earnings before interest and tax	19,50,000	19,50,000	19,50,000
Less: Interest:			
@ 10% on first ₹5,00,000	50,000	50,000	50,000
@ 15% on ₹5,00,001 to ₹10,00,000	-	75,000	75,000
@ 20% on above ₹10,00,000	-	-	80,000
EBT	19,00,000	18,25,000	17,45,000
Less: Tax @ 40%	7,60,000	7,30,000	6,98,000
EAT	11,40,000	10,95,000	10,47,000
÷ No. of Equity shares			
Existing	1,00,000	1,00,000	1,00,000
New	7,500	5,000	3,000
	(15,00,000/200)	(10,00,000/200)	(6,00,000/200)
EPS	₹10.60	₹10.43	₹10.17

Decision: The earning per share is higher in alternative I i.e. if the company finance the project by raising debt of ₹5,00,000 & issue equity shares of ₹15,00,000. Therefore, the company should choose this alternative to finance the project.

Solution 5

(a) Calculation of cost of Convertible Debentures using Approximation method:

$$K_d = \frac{I(1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100 = \frac{15(1-0.40)+\frac{130.58-95}{6}}{\frac{130.58+95}{2}} \times 100$$

$$= 13.24\%$$

Working Notes:

Determination of Redemption value:

Higher of

(i) The cash value of debentures = ₹100

(ii) Value of equity shares = 2 shares × ₹48.72 $(1 + 0.05)^6$ = ₹130.58

₹130 will be taken as redemption value as it is higher than the cash option and attractive to the investors.

Calculation of Value of Share today:

$$P_0 = \frac{D_1}{K_e - g} = \frac{12.76(1+0.05)}{32.50\% - 5\%} = ₹48.72$$

$$K_e = R_f + \beta (R_m - R_f) = 10\% + 1.25 \times 18\% = 32.50\%$$

$$g = \sqrt[5]{\frac{12.76}{10.00}} = 5\% \text{ or}$$

g = 12.76 ÷ 10.00 = 1.276 (5% for 5 year; given in interest rate table)

(b) Calculation of Cost of Preference shares using YTM method::

Calculation of NPV at two discount rates:

Year	Cash Flow	Present Value		Present Value	
		3%	DCF	5%	DCF
0	103.40	1.000	(103.40)	1.000	(103.40)
1 - 10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
NPV			+13.65		-3.39

$$IRR/K_d = LR + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L) = 3\% + \frac{13.65}{13.65 - (-3.39)} \times (5\% - 3\%)$$

$$= 4.60\%$$

Working Note:

Net Proceeds = Issue Price – Flotation Cost

= (100 + 10% Premium) – 6% = ₹103.40