FINANCIAL MANAGEMENT CA - INTERMEDIATE

QUESTIONNAIRE BOOK

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PREFACE

To all readers,

I am proud to present this book along with Team Expert. I have spent time writing this with a student perspective in mind. Each chapter has broken down core concepts and expanded on them with diagrams and tables, as and when possible. It is my goal to help each and every holder of this book to be able to fight against the odds and win. Victory presents itself with the backing of knowledge, practice and expertise.

This book provides a valuable window on the subject and covers the necessary components chapter by chapter. The challenges in this subject are both difficult and interesting.

People are working on them with enthusiasm, tenacity, and dedication to develop new methods of analysis and provide new solutions to keep up with the ever-changing threats. In this new age of global interconnectivity and interdependence, it is necessary to stay relevant, for both professionals and students.

This book is a good step in that direction and would not have been possible without my team, my colleagues, my students and everyone that has supported me in my journey as a CA professional. For any feedback or questions based on the material covered within the book, please feel free to contact me via email.

Regards,

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CA INTERMEDIATE
FINANCIAL MANAGEMENT
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CHAPTER 1 SCOPE & OBJECTIVES OF FINANCIAL MANAGEMENT

PROBLEM 1

You want to endow a prize that would pay ₹ 100,000 per annum. You want to make a one – time payment because you are not sure where you would be during subsequent years. If the time value is 10%, how much will you have to invest today?

Solution:

PV of infinite annuity = A/r

Where A = ₹ 100,000, r = 10%

PV = 100,000/10% = ₹ 10,00,000 /-

Thus, you need to invest ₹ 10,00,000 today.

PROBLEM 2

Find out the present value of a 4 years annuity of ₹ 20,000 discounted at 10 percent.

Solution:

PV of finite annuity = A x PVAF (r,n)

Where A = ₹ 20,000 r = 10% & n = 4 years

PV = 20,000 x 3.1699 = ₹ 63,398 /-

Thus, the PV is ₹ 63,398 /-

PROBLEM 3

What is the present value of an income stream which provides ₹ 1,000 at the end of year one, ₹ 2,500 at the end of year two and ₹ 5,000 during each of the year 3 through 10, if the discount rate is 12 percent.

Solution:

Statement showing computation of Present Value

Year	Particulars	CF	DF @ 12%	DCF
1	Cash in flow	1000	0.8929	893
2	Cash in flow	2500	0.7972	1993
3-10	Cash in flow	5000	3.9602	19,801
				22,687

PROBLEM 4

What is the present value of an income stream which provides ₹ 2,000 a year for the first five years, and ₹ 3,000 a year forever thereafter, if the discount rate is 10 percent?

Solution:

For 2,000 p.a. for the first 5 years

PV of finite annuity = A x PVAF (r,n)

Where A = ₹ 2,000 r = 10% & n = 5 years

PV = 2,000 x 3.7908 = ₹ 7,582 /-

For ₹ 3,000 p.a. forever after the first 5 years

PV of infinite annuity at the end of 5^{th} year = A/r

Where A = ₹ 3,000 r = 10%

PV at the end of 5^{th} year = 3,000/10% = ₹ 30,000 /-

PV = FV x PVF (r,n)

PV = 30,000 x 0.6209 = ₹ 18,628 /-

Total PV = 7,582 + 18,628 = ₹ 26,210

PROBLEM 5

A finance company makes an offer to deposit a sum of ₹ 1,100 and then receive a return of ₹ 80 p.a. perpetually. Should this offer be accepted if the rate of interest is 8%? Will the decision change if the rate of interest is 5%?

Solution:

Part A: When discount rate is 8%

PV of infinite annuity = A/r

Where A = ₹ 80 r = 8%

PV = 80 / 8% = ₹ 1,000 /-

Thus, PV of future annuity is ₹ 1,000 /- whereas we need to invest ₹ 1,100 /- therefore the offer should be rejected.

Part B: When discount rate is 8%

PV of infinite annuity = A/r

Where A = ₹ 80 r = 5%

PV = 80 / 5% = ₹ 1,600 /-

Thus, PV of future annuity is ₹ 1,600 /- whereas we need to invest ₹ 1,100 /- therefore the offer should be accepted.

PROBLEM 6

Assume that a deposit is to be made at year zero into an account that will earn 8% compounded annually. It is desired to withdraw ₹ 5,000 three years from now and ₹ 7,000 six years from now. What is the size of the year zero deposit that will produce these future payments.

Solution:

Statement showing computation of Present Value

Year	Particulars	CF	DF @ 8%	DCF
3	Cash in flow	5000	0.7938	3,969
6	Cash in flow	7000	0.6302	4,411
				8,380

Thus, we need to invest ₹ 8,380 /- today to withdraw ₹ 5,000 after 3 years & ₹ 7,000 after 6 years.

PROBLEM 7

Assume that a ₹ 20,00,000 plant expansion is to be financed as follows: The firm makes a 15% own payment and borrows the remainder at 9% interest rate. The loan is to be repaid in 8 equal annual installments beginning 4 years from now. What is the size of the required annual loan payments.

Solution:

Today's borrowing amount: 20,00,000 -15% = ₹ 17,00,000 /-

PV of finite annuity = A x PVAF (r,n)

Where PV = ₹ 17,00,000 r = 9% & n = 4 -11 years (8 installments)

17,00,000 = A x 4.2739 = ₹ 3,97,763 /-

Thus, the annual loan installment is ₹ 3,97,763 /-

PROBLEM 8

Raj has invested ₹ 1,00,000 in computer system and wishes to give on lease. Life of the computer system is 5 yeas without any scrap value. What should be the annual lease rent, if lessor's opportunity rate of interest is 20% p.a.

Solution:

PV of finite annuity = A x PVAF (r,n)

Where PV = ₹ 1,00,000 r = 20 % & n = 5 years

1,00,000 = A x 2.9906 = ₹ 33,438 /-

Thus, the annual lease rental is ₹ 33,438 /-

PROBLEM 9

You need ₹ 10,000 for buying textbooks next year. You can earn 7% on your money. How much do you need to invest today?

Solution:

PV = FV x PVF (r,n)

PV = 10,000 x 0.9346 = ₹ 9,346 /-

Thus, you need to invest ₹ 9,346 /- today to buy text books after 1 year.

CHAPTER 2 LEVERAGES

PROBLEM 1

A Company produces and sells 10,000 shirts. The selling price per shirt is ₹ 500. Variable cost is ₹ 200 per shirt & fixed operating cost is ₹ 25,00,000.

a) CALCULATE operating leverage.

b) If sales are up by 10%, the COMPUTE the impact on EBIT?

Solution:

a) Statement of Profitability

	₹
Sales Revenue (10,000 x 500)	50,00,000
Less: Variable Cost (10,000 x 200)	20,00,000
Contribution	30,00,000
Less: Fixed Cost	25,00,000
EBIT	5,00,000

Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{30 \text{ lakhs}}{5 \text{ lakhs}} = 6$ times

b) Operating Leverage (OL) $= \frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in Sales}}$

$$6 = \frac{x / 5{,}00{,}000}{5{,}00{,}000/50{,}00{,}000}$$

$$X = ₹\ 3{,}00{,}000$$

$\therefore \Delta EBIT = ₹\ 3{,}00{,}000 / 5{,}00{,}000 = 60\%$

PROBLEM 2

CALCULATE the operating leverage for each of the four firms A, B, C and D from the following price and cost data:

	Firms			
	A (₹)	**B (₹)**	**C (₹)**	**D (₹)**
Sale price per unit	20	32	50	70
Variable cost per unit	6	16	20	50
Fixed operating cost	60,000	40,000	1,00,000	Nil

What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? Explain. Assume number of units sold is 5,000.

Solution:

	Firms			
	A	**B**	**C**	**D**
Sales (units)	5,000	5,000	5,000	5,000
Sales revenue (Units x price) (₹)	1,00,000	1,60,000	2,50,000	3,50,000
Less: Variable Cost	(30,000)	(80,000)	(1,00,000)	(2,50,000)
(Units x variable cost per unit) (₹)	70,000	80,000	1,50,000	1,00,000
Less: Fixed operating costs (₹)	(60,000)	(40,000)	(1,00,000)	Nil
EBIT	10,000	40,000	50,000	1,00,000

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

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

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

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

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

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

PROBLEM 3

A firm's details are as under:

Sales (@ 100 per unit)	₹ 24,00,000
Variable Cost	50%
Fixed Cost	₹ 10,00,000

It has borrowed ₹ 10,00,000 @ 10% p.a. and its equity share capital is ₹ 10,00, 000 (₹ 100 each). Consider tax @ 50%.

CALCULATE:

a) Operating Leverage

b) Financial Leverage

c) Combined Leverage

d) Return on Investment

e) If the sales increases by ₹ 6,00,000; what will the new EBIT?

Solution:

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

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

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

c) Combined Leverage = OL x FL = 6 x 2 = 12 times.

d) Here ROI $= \frac{\text{EBIT}}{\text{Capital employed}}$ x 100

R.O.I. $= \frac{200,000}{20,00,000}$ x 100 = 10%

e) Operating Leverage = 6

$$6 = \frac{\Delta \text{ EBIT}}{0.25}$$

$$\Delta \text{ EBIT} = \frac{6 \text{ x } 1}{4} = 1.5$$

Increase in EBIT = ₹ 2,00,000 x 1.5 = ₹ 3,00,000

New BIT = 5,00,000

PROBLEM 4

From the following information extracted from the books of accounts of Imax Ltd., CALCULATE percentage change in earnings per share, if sales increase by 10% and Fixed Operating cost is ₹ 1,57,500.

Particulars	Amount in ₹
EBIT (Earnings before Interest and Tax)	31,50,000
Earnings before Tax (EBT)	14,00,000

Solution:

1. **Operating Leverage (DOL)**

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT + Fixed Cost}}{\text{EBIT}} = \frac{31,50,000 + 1,57,500}{31,50,000} = 1.05$$

Financial Leverage (DFL)

$= \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Rs. } 31{,}50{,}000}{\text{Rs. } 14{,}00{,}000} = 2.25$

Combined Leverage (DCL)

= 1.05 x 2.25 = 2.3625

Percentage Change in Earnings per share

$\text{DCL} = \frac{\%\text{ change in EPS}}{\%\text{ Change in sales}} = 2.3625 = \frac{\%\text{ change in EPS}}{10\%}$

∴ % change in EPS = 23.625%

Hence, if sale is increased by 10%, EPS will be increased by 23.625%.

PROBLEM 5

Consider the following information for Mega Ltd.:

Production level	2,500 units
Contribution per unit	₹ 150
Operating leverage	6
Combined leverage	24
Tax rate	30%

Required:

COMPUTE its earnings after tax.

Solution:

1. Computation of Earnings after tax

   Contribution = ₹ 150 x 2,500 = ₹ 3,75,000

   Operating Leverage (DOL) x Financial Leverage (DFL) = Combined Leverage (DCL)

   6 x Financial Leverage = 24

   ∴ Financial Leverage = 4

   Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{3{,}75{,}000}{\text{EBIT}} = 6$

   ∴ EBIT $= \frac{3{,}75{,}000}{6} =$ ₹ 62,500

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

   ∴ EBT $= \frac{\text{EBIT}}{4} = \frac{62{,}500}{4} =$ ₹ 15,625

   Since tax rate = 30%

   Earnings after Tax (EAT) = EBT (1 – 0.30) [30% is tax rate] = ₹ 15,625 (0.70)

   ∴ Earnings after Tax (EAT) = ₹ 10,938

PROBLEM 6

From the following information, prepare Income Statement of Company A & B:

Particulars	Company A	Company B
Marginal of safety	0.20	0.25
Interest	₹ 3000	₹ 2000
Profit volume ratio	25%	33.33%
Financial Leverage	4	3
Tax rate	45%	45%

Solution:

Income Statement

Particulars	Company A	Company B
Sales	80,000	36,000
Less: Variable Cost	60,000	24,000
Contribution	20,000	12,000
Less: Fixed Cost	16,000	9,000
EBIT	4,000	3,000
Less: Interest EBT	3,000	2,000
Tax (45%)	1,000	1,000
	450	450
	550	550

Working Notes:

(i) Company A

Financial Leverage = EBIT / (EBIT – Interest) 4 = EBIT / (EBIT - ₹ 3,000)

4EBIT - ₹ 12,000 = EBIT

3 EBIT = ₹ 12,000

EBIT = ₹ 4,000

Company B

Financial Leverage = EBIT / (EBIT – Interest) 3 = EBIT / (EBIT - ₹ 2,000)

3EBIT - ₹ 6000 = EBIT

2 EBIT = ₹ 6,000

EBIT = ₹ 3,000

(ii) Company A

Operating Leverage = 1/Margin of Safety

= 1/0.20 = 5

Operating Leverage = Contribution / EBIT

5 = Contribution / ₹ 4,000 Contribution = ₹ 20,000

Company B

Operating Leverage = 1/Margin of Safety

= 1/0.25 = 4

Operating Leverage = Contribution /EBIT

4 = Contribution / ₹ 3,000 Contribution = ₹ 12,000

(iii) Company A

Profit Volume Ratio = 25% (Given)

Profit Volume Ratio = Contribution / Sales * 100 25% = ₹ 20,000/Sales

Sales = ₹ 20,000/25% Sales = ₹ 80,000

Company B

Profit Volume Ratio = 33.33% Therefore, Sales = ₹ 12,000 / 33.33%

Sales = ₹ 36,000

PROBLEM 7

Betatronics Ltd. has the following Balance Sheet and Income Statement information:

Balance Sheet as on March, 31st 2023

Liabilities	**₹**	**Assets**	**₹**
Equity Capital (₹ 10 per share)	8,00,000	Net Fixed Assets	10,00,000
10% Debt	6,00,000	Current Assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

Income Statement for the year ending March 31st 2023

Particulars	**₹**
Sales	3,40,000
Operating expenses (including ₹ 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax	1,60,000
Less: Taxes	56,000
Net Earnings (EAT)	1,04,000

a) DETERMINE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.

b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, COMPUTE the earnings per share at the new sales level?

Solution:

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

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

DFL $= \frac{2,20,000}{1,60,000} = 1.38$

DCL = DOL x DFL = 1.27 x 1.38 = 1.75

b) Earnings per share at the new sales level

	Increase by 20%	**Decrease by 20%**
	(₹)	**(₹)**
Sales Level	4,08,000	2,72,000
Less: Variable expenses	72,000	48,000
Less: Fixed cost	60,000	60,000
Earnings before interest and taxes	2,76,000	1,64,000
Less: Interest	60,000	60,000
Earnings before taxes	2,16,000	1,04,000
Less: Taxes	75,600	36,400
Earnings after taxes (EAT)	1,40,400	67,600
Number of equity shares	80,000	80,000
EPS	1.76	0.85

Working Notes:

(i) Variable Costs = ₹ 60,000 (total cost – depreciation)

(ii)Variable Costs at:

(a) Sales level, ₹ 4,08,000 = ₹ 72,000 (increase by 20%)

(b) Sales level, ₹ 2,72,000 = ₹ 48,000 (decrease by 20%)

PROBLEM 8

A company had the following Balance Sheet as on 31st March, 2023:

Liabilities	**(₹ in crores)**	**Assets**	**(₹ in crores)**
Equity Share Capital (50 lakhs shares of ₹ 10 each)	5		
Reserves and Surplus	1	Fixed Assets (Net)	12.5
15% Debentures	10	Current Assets	7.5
Current Liabilities	4		
	20		20

The additional information given is as under:

Fixed cost per annum (excluding interest)	₹ 4 crores
Variable operating cost ratio	65%
Total assets turnover ratio	2.5
Income Tax rate	30%

Required:

(i) Earnings Per Share

(ii) Operating Leverage

(iii) Financial Leverage

(iv) Combined Leverage

Solution:

Total Assets = ₹ 20

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = 20 x 2.5 = ₹ 50 Crores

Computation of Profit After Tax (PAT)

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

(i) Earnings per Share:

$$\text{EPS} = \frac{8.40 \text{ Crores}}{\text{Number of Equity Shares}} = \frac{8.40 \text{ Crores}}{50{,}00{,}000} = ₹\ 16.80$$

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

(ii) Operating Leverage:

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{17.50}{13.50} = 1.296$$

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

(iii) Financial Leverage:

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{13.50}{12.00} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis – a – vis EBIT.

(iv) Combined Leverage:

$$\text{OR, Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ X } \frac{\text{EBIT}}{\text{PBT}}$$

= Operating Leverage x Financial Leverage

= 1.296 x 1.125 = 1.458

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis – a – vis change in sales. The leverages operating, financial and combined are used as measurement of risk.

PROBLEM 9

The following information is related to YZ company Ltd. For the year ended 31st March 2023

Equity share capital (₹ 10 each)	₹ 50 lakhs
12% Bonds (₹1000 each)	₹ 37 lakhs
Sales	₹ 84 Lakhs
Fixed cost (excluding interest)	₹ 6.96 Lakhs
Financial leverage	1.49 times
PV ratio	27.55%
Income tax rate	40%

You are required to calculate:

(i) Operating leverage

(ii) Combined leverage

(iii) Earnings per share

Show up the calculations up-to 2 decimal points.

Solution:

Computation of PAT

Particulars	**Amount (₹)**
Sales	84,00,000
Contribution (Sales x PV Ratio)	23,14,200
Less: Fixed Cost (excluding interest)	6,96,000
EBIT	16,18,200
Less: Interest on Debentures (37 lakhs x 12%)	4,44,000
Less: Other interest (balancing figure)	88,160
EBT	10,86,040
Less: tax @ 40%	4,34,416
EAT	6,51,624
EPS = EAT / no. of Shares	1.3

Operating Leverage = Contribution / EBIT
= 23,14,200 / 16,18,200
= 1.43 times

Combined leverage = DOL x DFL
= 1.43 x 1.49
= 2.13 times

DFL = EBIT / EBT
1.49 = 16,18,200 / EBT
EBT = 10,86,040 /-

PROBLEM 10

The following information is available for SS Ltd.

Profit volume (PV) ratio	- 30%
Operating leverage	- 2.00
Financial leverage	- 1.50
Loan	- ₹ 1,25,000
Post-tax interest rate	- 5.6%
Tax rate	- 30%
Market Price per share (MPS)	- ₹ 140
Price Earnings Ratio (PER)	- 10

You are required to

(a) Prepare the Profit-Loss statement of SS Ltd. and

(b) Find out the number of equity shares.

Solution:

Post – tax interest = 5.6%

$\therefore$ Pre – tax interest $= \frac{5.6}{(1-0.3)} = \frac{5.6}{0.7} = 8\%$

$\therefore$ Interest Amount = Loan x 8%

= 125000 x 8%

= 10,000

DFL $= \frac{\text{EBIT}}{\text{EBIT} - \text{INTEREST}}$

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

$\therefore$ 1.5 EBIT – 15000 = EBIT

$\therefore$ 0.5 EBIT = 15000

$\therefore$ EBIT $= \frac{15000}{0.5} = 30{,}000$

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

$2 = \frac{\text{Contribution}}{30{,}000}$ $\therefore$ Contribution = 30,000 x 2 = 60,000/-

$\therefore$ P/V Ratio $= \frac{\text{Contribution}}{\text{sales}}$ $\therefore$ 30% $= \frac{60{,}000}{\text{sales}}$ $\therefore$ sales = 200,000/-

Profitability Statement

Sr. No.	Particulars	Amount (₹)
A	Sales	200,000
B	Variable Cost (Balancing figure)	140,000*
C	Contribution	60,000
D	Fixed Cost (Balancing figure)	30,000
E	EBIT	30,000
F	Interest	10,000
G	EBT	20,000
H	Tax @ 30%	6,000
I	EAT or NI	14,000
J	EPS	14
K	PIE Ratio	10
L	MPS (J x K)	140
M	No. of share (I ÷ J)	1000 shares

PROBLEM 11

Debu Ltd. currently has an equity share capital of ₹ 1,30,00,000 consisting of 13,00,000 Equity shares. The company is going through a major expansion plan requiring to raise funds to the tune of ₹ 78,00,000. To finance the expansion the management has following plans:

Plan-I : Issue 7,80,000 Equity shares of ₹ 10 each.

Plan-II : Issue 5,20,000 Equity shares of ₹ 10 each and the balance through long-term borrowing at 12% interest p.a.

Plan-III : Issue 3,90,000 Equity shares of ₹ 10 each and 39,000, 9% Debentures of ₹ 100 each.

Plan-IV : Issue 3,90,000 Equity shares of ₹ 10 each and the balance through 6% preference shares.

EBIT of the company is expected to be ₹ 52,00,000 p.a.

Considering corporate tax rate @ 40%, you are required to-

(i) CALCULATE EPS in each of the above plans.

(ii) ASCERTAIN financial leverage in each plan and comment.

Solution:

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

Computation of EPS and Financial Leverage

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

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

$= \left(\frac{52,00,000}{(52,00,000-0)-(\frac{2,34,000}{(1-0.4)})}\right) = \left(\frac{52,00,000}{48,10,000}\right) = 1.08$

PROBLEM 12

The following information is related to Navya Company Ltd. for the year ended 31st March 2023:

Equity share capital (₹ 10 each)	₹ 65,50,000
12% Bonds of ₹ 1,00 each	₹ 60,91,400
Sales	₹ 111 lakhs
Fixed cost (excluding interest)	₹ 7,15,000
Financial leverage	1.55
Profit-volume Ratio	25%
Income Tax Applicable	30%

You are required to CALCULATE:
Operating Leverage.

Combined leverage; and

Earnings per share.

Show calculations upto two decimal points.

Solution:

a) Income Statement

Particulars	Amount (₹)
Sales	1,11,00,000
Contribution (Sales × P/V ratio)	27,75,000
Less: Fixed cost (excluding Interest)	(7,15,000)
EBIT (Earnings before interest and tax)	20,60,000
Less: Interest on debentures (12% x ₹ 60,91,400)	(7,30,968)
EBT (Earnings before tax)	13,29,032
Less: Tax @ 30%	3,98,710
PAT (Profit after tax)	9,30,322

(i) Operating Leverage:

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs.27,75,000}}{\text{Rs.20,60,000}} = 1.35$$

(ii) Combined Leverage:

= Operating Leverage × Financial Leverage

= 1.35 x 1.55 = 2.09 (Approx)

Or,

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

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{Rs.20,60,000}}{\text{Rs.13,29,032}} = 2.09 \text{ (Approx)}$$

(iii) Earnings per share (EPS):

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

PROBLEM 13

Following information is provided relating to SVB Ltd.:

Sales price ₹ 21 per unit

Variable cost ₹ 13.50 per unit

Break-even point 30,000 units

You are required to CALCULATE operating leverage at sales volume 37,500 units and 45,000 units.

Solution:

Computation of Operating Leverage (OL)

Selling Price = ₹ 21 per unit Variable Cost = ₹ 13.50 per unit

Fixed Cost = BEP × (Selling price – Variable cost) = 30,000 × (21 – 13.50)

= 30,000 × 7.5 = 2,25,000

Particulars	For 37,500 units (₹)	For 45,000 units (₹)
Sales (@ ₹ 21 /unit)	7,87,500	9,45,000
Less: Variable Cost (@ 13.50 /unit)	5,06,250	6,07,500
Contribution	2,81,250	3,37,500
Less: Fixed Cost	2,25,000	2,25,000
Earnings before Interest and tax (EBIT)	56,250	1,12,500
Operating Leverage $(\frac{\text{Contribution}}{\text{EBIT}})$	$(\frac{2,81,250}{56,250})$	$(\frac{3,37,500}{1,12,500})$
Operating Leverage	5 times	3 times

CHAPTER 3 FINANCING DECISIONS – CAPITAL STRUCTURE

PROBLEM 1

Rupa Ltd.'s EBIT is ₹ 5,00,000. The company has 10%, ₹ 20 lakh debentures. The equity capitalization rate i.e. Ke is 16%.

You are required to CALCULATE:

(i) Market value of equity and value of firm

(ii) Overall cost of capital.

Solution:

(i) Statement showing value of firm

	₹
EBIT	5,00,000
Less: Interest on debentures (10% of ₹ 20,00,00000)	(2,00,000)
Earnings available for equity holders i.e. Net Income (NI)	3,00,000
Equity capitalization rate (Ke)	16%
Market value of equity (S) = $\frac{NI}{K_e} = \frac{3,00,000}{16.00}$ 100	18,75,000
Market value of debt (D)	20,00,000
Total value of firm V = S + D	38,75,000

(ii) Overall cost of capital = $\frac{EBIT}{Value\ of\ firm} = \frac{5,00,000}{38,75,000}$ = 12.90%

PROBLEM 2

Indra Ltd. has EBIT of ₹ 1,00,000. The company makes use of debt and equity capital. The firm has 10% debentures of ₹ 5,00,000 and the firm's equity capitalization rate is 15%.

You are required to COMPUTE:

(i) Current value of the firm

(ii) Overall cost of capital.

Solution

(i) Calculation of total value of the firm

	₹
EBIT	1,00,000
Less: Interest (@ 10% on ₹ 5,00,000)	50,000
Earnings available for equity holders	50,000
Equity capitalization rate i.e. K_e	15%

Value of equity holders = $\frac{Earnings\ available\ for\ equity\ holders}{Value\ of\ equity\ (S)}$

= $\frac{50,000}{0.15}$ = ₹ 3,33,333

Value of Debt (given) D	5,00,000
Total Value of the firm V = D + S (5,00,000 + 3,33,333)	8,33,333

(ii) Overall cost of capital $= K_o = K_e \frac{S}{V} + K_d \frac{D}{V}$ or $\frac{EBIT}{V}$

$$= 0.15 \left[\frac{3,33,333}{8,33,333}\right] + 0.10 \frac{5,00,000}{8,33,333}$$

$$= \frac{1}{8,33,333} [50,000 + 50,000] = 12.00\%$$

PROBLEM 3

DETERMINE the optimal capital structure of a company from the following information:

Options	Cost of Debt (K_d) in %	Cost of Equity (K_e) in %	Percentage of Debt on total value (Debt + Equity)
1	11	13.0	0.0
2	11	13.0	0.1
3	11.6	14.0	0.2
4	12.0	15.0	0.3
5	13.0	16.0	0.4
6	15.0	18.0	0.5
7	18.0	20.0	0.6

Solution:

Note that the ratio given in this question is not debt to equity ratio. Rather it is the debt to value ratio. Therefore, if the ratio is 0.6, it means that capital employed comprises 60% debt and 40% equity.

$$K_o = \frac{Kd \times D + Ke \times S}{D+S}$$

In this question total of weight is equal to 1 in all cases, hence we need not to divide by it.

1) K_0 = 11% x 0 + 13% x 1 = 13%
2) K_0 = 11% x 0.1 + 13% x 0.9 = 12.8%
3) K_0 = 11.6% x 0.2 + 14% x 0.8 = 13.52%
4) K_0 = 12% x 0.3 + 15% x 0.7 = 14.1%
5) K_0 = 13% x 0.4 + 16% x 0.6 = 14.8%
6) K_0 = 15% x 0.5 + 18% x 0.5 = 16.5%
7) K_0 = 18% x 0.6 + 20% x 0.4 = 18.8%

Decision: 2nd option is the best because it has lowest WACC.

PROBLEM 4

Amita Ltd.'s operating income (EBIT) is ₹ 5,00,000. The firm's cost of debt is 10% and currently the firm employs ₹ 15,00,000 of debt. The overall cost of capital of the firm is 15%.

You are required to CALCULATE:

(i) Total value of the firm.

(ii) Cost of equity.

Solution:

(i) Statement showing value of the firm

	₹
Net opening income / EBIT	5,00,000
Less: Interest on debentures (10% of ₹ 15,00,000)	(1,50,000)
Earnings available for equity holders	3,50,000
Total cost of capital (K_0) (given)	15%
Value of the firm V = $\frac{EBIT}{K_0} = \frac{5,00,000}{0.15}$	33,33,333

(ii) Calculation of cost of equity

	₹
Market value of debt (D)	15,00,000
Market value of equity (s) S = V – D = ₹ 33,33,333 - ₹ 15,00,000	18,33,333

$K_e = \frac{\text{Earnings available for equity holders}}{\text{Value of equity (S)}}$

Or, $= \frac{\text{EBIT – Interest paid on debt}}{\text{Market Value of equity}} = \frac{3,50,000}{18,33,333} = 19.09\%$

OR

$K_o = K_e \frac{S}{V} + K_d \frac{D}{V}$

$K_e = K_o \frac{V}{S} - K_d \frac{D}{S}$

$= 0.15 \left[\frac{33,33,333}{18,33,333}\right] - 0.10 \frac{15,00,000}{18,33,333}$

$= \frac{1}{18,33,333} [(0.15 \times 33,33,333) – (0.10 \times 15,00,000)]$

$= \frac{1}{18,33,333} [5,00,000 – 1,50,000] = 19.09\%$

PROBLEM 5

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 share of Alpha Ltd., DETERMINE your return if the company has net operating income of ₹ 3,60,000 and the overall capitalization rate of the company, K_0 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) ANALYSIS why does it differ from that of Alpha Ltd.?

Solution:

a) Value of the Alpha Ltd. = $\frac{NOI}{K_0} = \frac{3,60,000}{18\%} =$ ₹ 20,00,000

(i) Return on Shares on Alpha Ltd.

	₹
Value of the company	20,00,000
Market value of debt (50%)	10,00,000
Market value of shares (50%)	10,00,000
	₹
Net operating income	3,60,000
Interest on debt (8% x ₹ 10,00,000)	80,000
Earnings available to shareholders	2,80,000
Return on 2% shares (2% x ₹ 2,80,000)	5,600

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

b)

(i) calculation of Implied rate of return

	₹
Total value of company	20,00,000
Market value of debt (20% x ₹ 20,00,000)	4,00,000
Market value of equity (80% x ₹ 20,00,000)	16,00,000
	₹
Net operating income	3,60,000
Interest on debt (8% x ₹ 4,00,000)	32,000
Earnings available to shareholders	3,28,000

Implied required rate of return on equity = $\frac{3,28,000}{16,00,000}$ = 20.5%

(ii) It is lower than the Alpha Ltd. because Beta Ltd. uses less debt in its capital structure. As the equity capitalization 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.

PROBLEM 6:

When value of levered firm is more than the value of unlevered firm

There are two company N Ltd. and M Ltd., having same earnings before interest and taxes i.e. EBIT of ₹ 20,000. M Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% rate of interest. The cost of equity of N Ltd. is 10% and of M Ltd. is 11.50%.

COMPUTE how arbitrage process will be carried on?

Solution:

	Company	
	M Ltd.	**N Ltd.**
EBIT (NOI)	₹ 20,000	₹ 20,000
Debt (D)	₹ 1,00,000	---
K_e	11.50%	10%
K_d	7%	---

Value of equity (S) $= \frac{\text{NOI – Interest}}{\text{Cost of equity}}$

$S_M = \frac{20,000 - 7,000}{11.50\%} = ₹\ 1,13,043$

$S_N = \frac{20,000}{10\%} = ₹\ 2,00,000$

V_M = 1,13,043 + 1,00,000 (V = S + D) = ₹ 2,13,043

V_N = ₹ 2,00,000

Arbitration process:

Amount received by sell of 10% shares in M Ltd. (1,13,043 x 10%)	11,304
Personal borrowing (1,00,000 x 10%)	10,000
Total amount available for investment	21,304
Purchase of 10% shares in N Ltd. (2,00,000 x 10%)	20,000
Therefore surplus cash available	1,304

Position of investor in both the companies

	Company	
	M Ltd.	**N Ltd.**
EBIT (NOI)	₹ 20,000	₹ 20,000
Less: Interest (100,000 x 7%)	₹ 7,000	---
Net Income	₹ 13,000	₹ 20,000
Dividend receivable for shareholder	₹ 1,300	₹ 2,000
Less: Personal borrowing Interest (10,000 x 7%)	----	₹ 700
Net Income available for investor	₹ 1,300	₹ 1,300

Conclusion: Thus, investor will switch his holding from M Ltd. to N Ltd.

PROBLEM 7 :

Invest entire amount and get extra income.

Following data is available in respect of two companies having same business risk:

Capital employed = ₹ 2,00,000,

EBIT = ₹ 30,000

Ke = 12.5%

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@ 10%)	1,00,000	Nil
Equity	1,00,000	2,00,000

Investor is holding 15% shares in levered company. CALCULATE increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

Solution:

1. **Valuation of firms**

Particulars	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	30,000	30,000
Less: interest	10,000	Nil
Earnings available to Equity Shareholder (NI)	20,000	30,000
K_e	12.5%	12.5%
Value of Equity (S) = NI/ K_e	1,60,000	2,40,000
Debt	1,00,000	Nil
Value of Firm (S + D)	2,60,000	2,40,000

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

2. **Investment & Borrowings**

Sell shares in Levered company (1,60,000 x 15%)	24,000
Borrow money (1,00,000 x 15%)	15,000
Amount available for investment in shares of Unlevered company	39,000

3. **Change in Return**

Income from shares in Unlevered company (39,000 x 12.5%)	4,875
Less: interest on loan (15,000 x 10%)	1,500
Net Income from unlevered firm	3,375
Income from Levered firm (24000 x 12.5%)	3,000
Incremental Income due to arbitrage	375

PROBLEM 8:

When value of unlevered firm is more than the value of levered firm.

There are two companies U Ltd. and L Ltd., having same NOI of ₹ 20,000 except that L Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% and cost of equity of U Ltd. & L Ltd. are 10% and 18% respectively.

COMPUTE how arbitrage process will work.

Solution:

Particulars	Company	
	U Ltd.	L Ltd.
NOI	₹ 20,000	₹ 20,000
Debt Capital	---	₹ 1,00,000
K_d	---	7%
K_e	10%	18%
Value of equity capital (s) = $\frac{\text{EBIT – Interest}}{K_e}$	₹ 2,00,000	₹ 72,222
	$\frac{20,000}{0.10}$	$\frac{20,000 - 7,000}{0.18}$
Total value of the firm = V = S + D	₹ 2,00,000	₹ 1,72,222 (₹ 72,222 + ₹ 1,00,000)

Assume you have 10% shares of unlevered firm i.e. investment of 10% o ₹ 2,00,000 = ₹ 20,000 and Return @ 10% on ₹ 20,000. Investment will be 10% of earnings available for equity i.e. 10% x 20,000 = ₹ 2,000.

Alternative strategy:

Sell your shares in unlevered firm ₹ 20,000 and buy 10% shares of levered firm's equity plus debt

i.e. 10% equity of levered firm	= 7,222
10% debt to levered firm	= 10,000
Total investment	= 17,222

Your resources are ₹ 20,000

Surplus cash available = Surplus – Investment = 20,000 – 17,222 = ₹ 2,778

Your return on investment is:

7% on debt of ₹ 10,000	700
10% on equity i.e. 10% of earnings available for equity holders i.e. (10% x 13,000)	1,300
Total return	2,000

i.e. in both the cases the return received is ₹ 2,000 and still you have excess cash of ₹ 2,778.

Hence, you are better off i.e. you will start selling unlevered company shares and buy levered company's shares thereby pushing down the value of shares of unlevered firm and increasing the value of levered firm till equilibrium is reached.

In the above example we have not invested entire amount received from "sale of shares of Unlevered company". We also have the same level of earning along with reduced investment. Alternatively, we could have invested entire amount in Levered company. In that case annual earnings would have increased. An example for the same is as follows:

PROBLEM 9

Following data is available in respect of two companies having same business risk:

Capital employed = ₹ 2,00,000, EBIT = ₹ 30,000

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@ 10%)	1,00,000	Nil
Equity	1,00,000	2,00,000
K_e	20%	12.5%

Investor is holding 15% shares in Unlevered company, CALCULATE increase in annual earnings of investor if he switches his holding from Unlevered to Levered Company.

Solution:

1. **Valuation of firms**

Particulars	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	30,000	30,000
Less: interest	10,000	Nil
Earnings available to Equity Shareholder	20,000	30,000
K_e	20%	12.5%
Value of Equity	1,00,000	2,40,000
Debt	1,00,000	Nil
Value of Firm	2,00,000	2,40,000

Value of Unlevered Company is more than that of Levered company therefore investor will sell his shares in unlevered company and buy shares in levered company. Market value of Debt and Equity of Levered company are in the ratio of ₹ 1,00,000: ₹ 1,00,000, i.e., 1:1. To maintain the level of risk he will lend proportionate amount (50%) and invest balance amount (50%) in shares of Levered company.

2. Investment & Borrowings	₹
Sell shares in Unlevered company (240000 x 15%)	36,000
Lend money (36000 x 50%)	18,000
Buy shares in Levered company (36,000 x 50%)	18,000
Total	36,000

3. Change in Return	₹
Income from shares in Levered company (18000 x 20%)	3,600
Interest on money lent (18000 x 10%)	1,800
Total Income after switch over	5,400
Income from Unlevered firm (36,000 x 12.5%)	4,500
Incremental Income due to arbitrage	900

PROBLEM 10

Best of Luck Ltd., a profit making company, has a paid – up capital of ₹ 100 lakhs consisting of 10 lakhs ordinary shares of ₹ 10 each. Currently, it is earning an annual pre – tax profit of ₹ 60 lakhs. The company's shares are listed and are quoted in the range of ₹ 50 to ₹ 80. The management wants to diversify production and has approved a project which will cost ₹ 50 lakhs and which is expected to yield to pre – tax in come of ₹ 40 lakhs per annum. To raise this additional capital, the following options are under consideration of the management.

(a) To issue equity share capital for the entire additional amount. It is expected that the new shares (face value of ₹ 10) can be sold at a premium of ₹ 15.

(b) To issue 16% non – convertible debentures of ₹ 100 each for the entire amount.

(c) To issue equity capital for ₹ 25 lakhs (face value of ₹ 10) and 16% non – convertible debentures for the balance amount. In this case, the company can issue shares at a premium of ₹ 40 each.

CALCULATE the additional capital that can be raised, keeping in mind that the management wants to maximize the earnings per share to maintain its goodwill. The company is paying income tax at 50%.

Solution:

Calculation of Earnings per share under the three options:

Particulars	**Options**		
	Option I: Issue Equity shares only	**Option II: Issue 16% Debentures only**	**Option III: Issue Equity Shares an 16% Debentures of equal amount**
Number of Equity Shares (Nos):			
- Existing	10,00,000	10,00,000	10,00,000
- Newly issued	2,00,000 $\left(\frac{\text{Rs. } 50,00,000}{\text{Rs. } (10+15)}\right)$	---	50,000 $\left(\frac{\text{Rs. } 25,00,000}{\text{Rs. } (10+40)}\right)$
Total	12,00,000	10,00,000	10,50,000

16% Debentures ₹	---	50,00,000	25,00,000
Profit Before Interest and Tax:			
- Existing pre – tax profit	60,00,000	60,00,000	60,00,000
- From new projects	40,00,000	40,00,000	40,00,000
	1,00,00,000	1,00,00,000	1,00,00,000
Less: Interest on 16% Debentures	---	8,00,000	4,00,000
		(16% on ₹ 50,00,000)	(16% on ₹ 25,00,000)
Profit Before Tax	1,00,00,000	92,00,000	96,00,000
Tax at 50%	50,00,000	46,00,000	48,00,000
Profit After Tax	50,00,000	46,00,000	48,00,000
Earnings Per Share (EPS) $\left(\frac{\text{PAT}}{\text{No.of shares}}\right)$	4.17 $\frac{\text{Rs.50,00,000}}{\text{12,00,000}}$	4.60 $\left(\frac{\text{Rs.46,00,000}}{\text{10,00,000}}\right)$	4.57 $\left(\frac{\text{Rs.48,00,000}}{\text{10,50,000}}\right)$

PROBLEM 12

Tata Ltd. is considering two alternative financing plans as follows:

Particulars	**Plan – A (₹)**	**Plan – B (₹)**
Equity shares of ₹ 10 each	8,00,000	8,00,000
Preference shares of ₹ 100 each	---	4,00,000
12% Debentures	4,00,000	---
	12,00,000	12,00,000

The indifference point between the plans is ₹ 4,80,000. Corporate tax rate is 30%. CALCULATE the rate of dividend on preference shares.

Solution:

Computation of Rate of Preference Dividend

$$\frac{(\text{EBIT} - \text{Interest})\ (1 - t)}{\text{No.of Equity Shares } (N_1)} = \frac{\text{EBIT } (1 - t) - \text{Preference Dividend}}{\text{No.of Equity Shares } (N_2)}$$

$$\frac{(\ 4{,}80{,}000 - 48{,}000)\ \text{x}\ (1 - 0.30)}{80{,}000\ \text{Shares}} = \frac{4{,}80{,}000\ (1 - 0.30) - \text{Preference Dividend}}{80{,}000\ \text{Shares}}$$

$$\frac{3{,}02{,}400}{80{,}000\ \text{shares}} = \frac{3{,}36{,}000 - \text{Preference Dividend}}{80{,}000\ \text{shares}}$$

₹ 3,02,400 = ₹ 3,36,000 – Preference Dividend

Preference Dividend = ₹ 3,36,000 - ₹ 3,02,400 = ₹ 33,600

$$\text{Rate of Dividend} = \frac{\text{Preference Dividend}}{\text{Preference share capital}}\ 100$$

$$= \frac{33{,}600}{4{,}00{,}000}\ \text{x}\ 100 = 8.4\%$$

PROBLEM 13

One – third of the total market value of Sanghmani Limited consists of loan stock, which has a cost of 10 per cent. Another company, Samsui Limited, is identical in every respect to Sanghmani Limited, except that its capital structure is all – equity, and its cost of equity is 16 per cent. According to Modigliani and Miller, if we ignored taxation and tax relief on debt capital, COMPUTE the cost of equity of Sanghmani Limited?

Solution:

Here we are assuming that MM Approach 1958: Without tax, where capital structure has no relevance with the value of company and accordingly overall cost of capital of both levered as well as unlevered company is same. Therefore, the two companies should have similar WACCs. Because Samsui Limited is all – equity financed, i.e. 16 per cent. It follows that Sanghmani Limited should have WACC equal to 16 per cent also. Therefore, Cost of equity in Sanghmani Ltd. (levered company) will be calculated a follows:

$K_o = \frac{2}{3} \times K_e + \frac{1}{3} \times K_d = 16\%$ (i.e. equal to WACC of Samsui Ltd.)

Or, $16\% = \frac{2}{3} \times K_e + \frac{1}{3} \times 10\%$ Or, Ke = 19%

PROBLEM 14

ABC Limited provides you the following information:

	(₹)
Profit (EBIT)	2,80,000
Less: Interest on Debt @10%	40,000
EBT	2,40,000
Less: Income Tax @ 50%	1,20,000
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price / EPS (P/E) Ratio	10
Ruling Market price per share	40

The company has undistributed reserves of ₹ 7,00,000 and needs ₹ 4,00,000 further for expansion. This investment is expected to earn the same rate as funds already invested. You are informed that a debt equity (debt/ debt +equity) ratio higher than 32% will push the P/E ratio down to 8 and raise the interest rate on additional borrowings (debentures) to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional funds are raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price of ₹ 40 per share.

Solution:

Ascertainment of probable price of shares

Particulars	**Plan (i) (If ₹ 4,00,000 is raised as debt) (₹)**	**Plan (ii) (If ₹ 4,00,000 is raised by issuing equity shares) (₹)**
Earnings Before Interest (EBIT) 20% on (14,00,000 + 4,00,000)	3,60,000	3,60,000
Less: Interest on old debentures @ 10% on 4,00,000	40,000	40,000
	3,20,000	3,20,000
Less: Interest on New debt @ 12% on ₹ 4,00,000	48,000	-
Earnings Before Tax (After interest)	2,72,000	3,20,000
Less: Tax @ 50%	1,36,000	1,60,000
Earnings for equity shareholders (EAT)	1,36,000	1,60,000
Number of Equity Shares (in numbers)	30,000	40,000

Earnings per Share (EPS)	4.53	4.00
Price/ Earnings Ratio	8	10
Probable Price Per Share	36.24 (8 x 4.53)	40 (10 x 4)

Working Notes:

	(₹)
1. Calculation of Present Rate of Earnings	
Equity Share capital (30,000 x ₹ 10)	3,00,000
10% Debentures $(40{,}000 \times \frac{100}{10})$	4,00,000
Reserves (given)	7,00,000
	14,00,000
Earnings before interest and tax (EBIT) given	2,80,000
Rate of Present Earnings = $(\frac{2{,}80{,}000}{14{,}00{,}000} \times 100)$	20%
2. Number of Equity Shares to be issued in Plan $(\frac{4{,}00{,}000}{40})$	10,000
Thus, after the issue total number of shares	30,000 + 10,000 = 40,000
3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:	$(\frac{8{,}00{,}000}{18{,}00{,}000} \times 100)$ 44.44%

As the debt equity ratio is more than 32% the P/E ratio shall be 8 in plan (i)

PROBLEM 15

Leo Ltd. has a net operating income of ₹ 21,60,000 and the total capitalisation of ₹ 120 lakhs. The company is evaluating the options to introduce debt financing in the capital structure and the following information is available at various levels of debt value.

Debt value (₹)	Interest rate (%)	Equity Capitalisation rate (%)
0	N.A.	12.00
10,00,000	7.00	12.50
20,00,000	7.00	13.00
30,00,000	7.50	13.50
40,00,000	7.50	14.00
50,00,000	8.00	15.00
60,00,000	8.50	16.00
70,00,000	9.00	17.00
80,00,000	10.00	20.00

You are required to COMPUTE the equity capitalization rate if MM approach is followed. Assume that the firm operates in zero tax regime and calculations to be based on book values.

Solution:

As per MM approach, cost of the capital (K_o) remains constant, and cost of equity increases linearly with debt.

Value of a Firm = $\frac{NOI}{K_0}$

$\therefore$ 1,20,00,000 = $\frac{21{,}60{,}000}{K_0}$

$\therefore K_0 = \frac{21,60,000}{1,20,00,000} = 18\%$

Under MM approach, $k_e = k_0 + \frac{D}{E}(k_0 - k_d)$

Statement of equity capitalization under MM approach

Debt Value (₹)	Equity Value (₹)	Debt/ Equity	K_d (%)	K_o (%)	K_o-K_d (%)	$K_e = K_o+(K_o-K_d)$ (D/E) (%)
-	1,20,00,000	0.0000	NA	18.00	18.00	18.00
10,00,000	1,10,00,000	0.0909	7.00	18.00	11.00	19.00
20,00,000	1,00,00,000	0.2000	7.00	18.00	11.00	20.20
30,00,000	90,00,000	0.3333	7.50	18.00	10.50	21.50
40,00,000	80,00,000	0.5000	7.50	18.00	10.50	23.25
50,00,000	70,00,000	0.7143	8.00	18.00	10.00	25.14
60,00,000	60,00,000	1.0000	8.50	18.00	9.50	27.50
70,00,000	50,00,000	1.4000	9.00	18.00	9.00	30.60
80,00,000	40,00,000	2.0000	10.00	18.00	8.00	34.00

PROBLEM 16

The financial advisor of Sun Ltd. is confronted with following two alternative financing plans for raising ₹ 10 lakhs that is needed for plant expansion and modernization

Alternative I: Issue 80% of funds with 14% Debenture [Face value (FV) ₹ 100] at par and redeem at a premium of 10% after 10 years and balance by issuing equity shares at $33\frac{1}{3}$ % premium.

Alternative II: Raise 10% of funds required by issuing 8% Irredeemable Debentures [Face value (FV) ₹ 100] at par and the remaining by issuing equity shares at current market price of ₹ 125.

Currently, the firm has an Earnings per share (EPS) of ₹ 21

The modernization and expansion programme is expected to increase the firm's Earnings before Interest and Taxation (EBIT) by ₹ 200,000 annually.

The firm's condensed Balance Sheet for the current year is given below:

Balance Sheet as on 31.3.2022

Liabilities	(₹)	Assets	(₹)
Current Liabilities	5,00,000	Current Assets	16,00,000
10% Long Term Loan	15,00,000	Plant & Equipment (Net)	34,00,000
Reserves & Surplus	10,00,000		
Equity Share Capital (FV: ₹ 100 each)	20,00,000		
TOTAL	**50,00,000**	**TOTAL**	**50,00,000**

However, the finance advisor is concerned about the effect that issuing of debt might have on the firm. The average debt ratio for firms in industry is 35%. He believes if this ratio is exceeded, the P/E ratio of the company will be 7 because of the potentially greater risk.

If the firm increases its equity capital by more than 10 %, he expects the P/E ratio of the company will increase to 8.5 irrespective of the debt ratio.

Assume Tax Rate of 25%. Assume target dividend pay-out under each alternative to be 60% for the next year and growth rate to be 10% for the purpose of calculating Cost of Equity.

SUGGEST with reason which alternative is better on the basis of each of the below given criteria:

I. Earnings per share (EPS) & Market Price per share (MPS)
II. Financial Leverage
III. Weighted Average Cost of Capital & Marginal Cost of Capital (using Book Value weights)

Solution:

Calculation of Equity Share capital and Reserves and surplus:

Alternative 1:

Equity Share capital = ₹ 20,00,000 + $\frac{\text{Rs.2,00,000 x 100}}{133.3333}$ = ₹ 21,50,000

Reserves = ₹ 10,00,000 + $\frac{\text{Rs.2,00,000 x 33.3333}}{133.3333}$ = ₹ 10,50,000

Alternative 2:

Equity Share capital = ₹ 20,00,000 + $\frac{\text{Rs.9,00,000 x 100}}{125}$ = ₹ 27,20,000

Reserves = ₹ 10,00,000 + $\frac{\text{Rs.9,00,000 x 25}}{125}$ = ₹ 11,80,000

Capital Structure Plans

(Amount in ₹)

Capital	Alternative 1 ₹	Alternative 2 ₹
Equity Share capital	21,50,000	27,20,000
Reserves and surplus	10,50,000	11,80,000
10% long term debt	15,00,000	15,00,000
14% Debentures	8,00,000	-
8% Irredeemable Debentures	-	1,00,000
Total Capital Employed	55,00,000	55,00,000

Computation of Present Earnings before interest and tax (EBIT)

EPS (₹)	21
No. of equity shares	20,000
Earnings for equity shareholders (I x II) (₹)	4,20,000
Profit Before Tax (III/75%) (₹)	5,60,000
Interest on long term loan (1500000 x 10%) (₹)	1,50,000
EBIT (IV + V) (₹)	7,10,000

EBIT after expansion = ₹ 7,10,000 + ₹ 2,00,000 = ₹ 9,10,000

Evaluation of Financial Plans on the basis of EPS, MPS and Financial Leverage

(Amount in ₹)

Particulars	Alternative I	Alternate II
EBIT	9,10,000	9,10,000
Less: Interest: 10% on long term loan	(1,50,000)	(1,50,000)
14% on Debentures	(1,12,000)	Nil
8% on Irredeemable Debentures	Nil.	(8000)
PBT	6,48,000	7,52,000
Less: Tax @25%	(1,62,000)	(1,88,000)
PAT	4,86,000	5,64,000

No. of equity shares	21,500	27,200
EPS	**22.60**	**20.74**
Applicable P/E ratio (Working Note 1)	7	8.5
MPS (EPS X P/E ratio)	**158.2**	**176.29**
Financial Leverage EBIT/PBT	**1.40**	**1.21**

Working Note 1

	Alternative I	**Alternative II**
Debt:		
₹ 15,00,000 + ₹ 8,00,000	23,00,000	-
₹ 15,00,000 + ₹ 1,00,000	-	16,00,000
Total capital Employed (₹)	55,00,000	55,00,000
Debt Ratio (Debt/Capital employed)	= 0.4182	= 0.2909
	= 41.82%	**= 29.09%**
Change in Equity: ₹ 21,50,000 - ₹ 20,00,000 ₹ 27,20,000 - ₹ 20,00,000	1,50,000	7,20,000
Percentage change in equity	7.5%	36%
Applicable P/E ratio	7	8.5

Calculation of Cost of equity and various type of debt

	Alternative I	**Alternative II**
A) Cost of equity		
EPS ₹	22.60	20.74
DPS (EPS X 60%) ₹	13.56	12.44
Growth (g)	10%	10%
Po (MPS)	158.2	176.29
Ke= Do (1 + g)/ Po	$\frac{13.56}{158.2}$ + 0.1 = 18.57%	$\frac{12.44}{176.29}$ + 0.1 = 17.06%
B) Cost of Debt:		
10% long term debt	10% (1-0.25)	10% (1-0.25)
	= 7.5%	= 7.5%
14% redeemable debentures	$\frac{14(1-0.25)+(110-100/10)}{110+100/2}$	nil
	= 10.5 + 1 / 10.5	
	= 10.95%	
8% irredeemable debenture	NA	8000 (1-0.25)/1,00,00 = 6%

Calculation of Weighted Average cost of capital (WACC)

	Alternative 1			**Alternative 2**		
Capital	**Weights**	**Cost (%)**	**WACC**	**Weights**	**Cost (%)**	**WACC**
Equity Share Capital	0.3909	18.57	7.26%	0.4945	17.06	8.44%
Reserves and Surplus	0.1909	18.57	3.55%	0.2145	17.06	3.66%
10% Long term Debt	0.2727	7.50	2.05%	0.2727	7.50	2.05%
14% Debenture	0.1455	10.95	1.59%			
8% Irredeemable Debentures	-			0.0182	6	0.11%
			14.44%			**14.25%**

Calculation Marginal Cost of Capital (MACC)

	Alternative 1			Alternative 2		
Capital	**(weight)**	**Cost (%)**	**MACC**	**(weight)**	**Cost (%)**	**MACC**
Equity Share Capital	₹ 1,50,000 (0.15)	18.57	2.79%	₹ 7,20,000 (0.72)	17.06	12.28%
Reserves and Surplus	₹ 50,000 (0.05)	18.57	0.93%	₹ 1,80,000 (0.18)	17.07	3.07%
14% Debenture	₹ 8,00,000 (0.80)	10.95	8.76%	-		0.00%
8% Irredeemable Debentures	-			₹ 1,00,000 (0.10)	6	0.60%
Total Capital Employed	₹ 10,00,000		**12.47%**	₹ 10,00,000		**15.95%**

Summary Solution:

	Alternate I	**Alternate II**
Earning per share (EPS) ₹	22.60	20.74
Market Price per share (MPS) ₹	158.20	176.29
Financial leverage	1.4043	1.2101
Weighted Average cost of capital (WACC)	14.44%	14.25%
Marginal cost of capital (MACC)	12.47%	15.95%

Alternative I of financing will be preferred under the criteria of EPS, whereas
Alternative II of financing will be preferred under the criteria of MPS,
Financial leverage, WACC and marginal cost of capital.

PROBLEM 17

Axar Ltd. has a Sales of ₹ 68,00,000 with a Variable cost Ratio of 60%.

The company has fixed cost of ₹16,32,000. The capital of the company comprises of 12% long term debt, ₹1,00,000 Preference Shares of ₹ 10 each carrying dividend rate of 10% and 1,50,000 equity shares.
The tax rate applicable for the company is 30%.

At current sales level, DETERMINE the Interest, EPS and amount of debt for the firm if a 25% decline in Sales will wipe out all the EPS.

Solution:

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

Income Statement **(Amount in ₹)**

	Original	**Calculation of Interest at BEP (backward calculation)**	**Now at present level**
Sales	68,00,000	51,00,000	68,00,000
Less: Variable Cost	40,80,000	30,60,000	40,80,000
Contribution	27,20,000	20,40,000	27,20,000
Less: Fixed Cost	16,32,000	16,32,000	16,32,000
EBIT	10,88,000	4,08,000	10,88,000
Less: Interest (EBIT-PBT)	?	3,93,714	3,93,714
PBT	?	14,286(10,000/70%)	6,94,286
Less: Tax @ 30% (or PBT-PAT)	?	4,286	2,08,286

PAT	?	10,000(Nil + 10,000)	4,86,000
Less: Preference Dividend	10,000	10,000	10,000
Earnings for Equity share holders	?	Nil (at BEP)	4,76,000
Number of Equity Shares	1,50,000	1,50,000	1,50,000
EPS	?	-	3.1733

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

PROBLEM 18

Company X and Company Y are in the same risk class, and are identical in every fashion except that Company X uses debt while Company Y does not. The levered firm has 9,00,000 debentures, carrying 10% rate of interest. Both the firms earn 20% before interest and taxes on their total assets of ₹ 15 lakh.

Assume perfect capital markets, rational investors and so on; a tax rate of 50% and capitalisation rate of 15% for an all equity company.

(i) Compute the value of firms X and Y using the Net Income (NI) approach.
(ii) Compute the value of each firm using the Net Operating Income (NOI) approach.
(iii) Using the NOI approach, calculate the overall cost of capital (ko) for firms X and Y.
(iv) Which of these two firms has an optimal capital structure according to the NOI approach? Why?

Solution:

(i) Computation of Value of Firms X and Y using NI Approach:

NI approach assumes no taxes. Since, the tax rate is given in the problem, we have to work out of NI approach.

Value of Firm = MV of Equity + MV of Debt		
	X (₹)	**Y (₹)**
EBIT (15 lakhs x 20%)	3,00,000	3,00,000
Less: Interest	90,000	-
PBT	2,10,000	3,00,000
Less: Tax @ 50%	1,05,000	1,50,000
PAT (Earnings for equity holders)	1,05,000	1,50,000
K_e	15%	15%
Capitalized value of equity	7,00,000	10,00,000
Market Value of Debt	9,00,000	-
Market Value of Firm	16,00,000	10,00,000

(ii) Computation of value of firms X and Y using NOI approach:

Net Operating Income approach assumes no taxes. Since the tax rate is given in the problem, we have to work out using MM approach, which is an extension of NOI approach.

Value of unlevered firm (Y) $= \frac{\text{EBIT x (1 – t)}}{k_e}$

= ₹ 3,00,000 (1 - 0.5) / 0.15

= ₹ 10,00,000

Value of Levered Firm (X) = Value of Unlevered Firm + Debt (Tax rate)

= Value of Y Ltd. + Debt (Tax rate)

= ₹10,00,000 + (₹9,00,000 × 50%)

= ₹ 14,50,000

(iii) Computation of Overall Cost of Capital (k_o) using NOI approach:

For Y Ltd –

$k_o = k_e = 15\%$ (as there is no debt)

For Firm X –

Value of firm (₹)	14,50,000
Less: Value of debt (₹)	9,00,000
Market value of equity (₹)	5,50,000

$$k_e = \frac{\text{Equity Earnings}}{\text{Market Value of Equity}} \times 100$$

$$= \frac{\text{Rs.1,05,000}}{\text{Rs.5,50,000}} \times 100 = 19\%$$

$$k_d = 0.10 \times (1.0 - 0.50) = 5\%$$

$$k_o = \left(19 \times \frac{\text{Rs.5,50,000}}{\text{Rs.14,50,000}}\right) + \left(5 \times \frac{\text{Rs.9,00,000}}{\text{Rs.14,50,000}}\right) = 10.31\%$$

(iv) Out of two firms, Firm X seems to have optimum capital structure as it has lower cost of capital higher value of firm.

CHAPTER 4 COST OF CAPITAL

PROBLEM 1

Five years ago, Sona Limited issued 12 per cent irredeemable debentures at ₹ 103, at ₹ 3 premium to their par value of ₹ 100. The current market price of these debentures is ₹ 94. If the company pay corporate tax at a rate of 35 per cent CALCULATE its current cost of debenture capital?

Solution:

Cost of irredeemable debenture.

$$K_d = \frac{I\,(1-t)}{NP}$$

$$K_d = \frac{12\,(1-0.35)}{94} = 0.08297 \text{ or } 8.30\%$$

PROBLEM 2

A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2017 to be matured on 1.4.2022. The debentures will be redeemed on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

Solution:

The cost of debenture (K_d) will be calculated as below:

$$\text{Cost of Debenture } (K_d) = \frac{I(1-t)+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} \text{ x } 100$$

I	=	Interest on debenture = 10% of ₹ 100	=	₹ 10
NP	=	Net Proceeds = 110% of ₹ 100	=	₹ 110
RV	=	Redemption Value	=	₹ 100
n	=	Period of debenture	=	5 years
t	=	Tax rate	=	35% or 0.35

$$(K_d) = \frac{10(1-0.35)+\frac{(100-110)}{5 \text{ years}}}{\frac{(100+110)}{2}}$$

$$\text{Or, } K_d = \frac{10 \text{ x } 0.65 - 2}{105} = \frac{4.5}{105} = 0.0428 \text{ or } 4.28\%$$

PROBLEM 3

A company issue 10,000, 10% debentures of ₹ 100 each at par on 1.4.2012 to be matured on 1.4.2022. The company wants to know the cost of its existing debt on 1.4.2017 when the market price of the debentures is ₹ 80.

COMPUTE the cost of existing debentures assuming 35% tax rate.

Solution:

Cost of Debenture (K_d) = $\frac{I(1-t)+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$ x 100

I	=	Interest on debenture = 10% of ₹ 100	=	₹ 10
NP	=	Current market price	=	₹ 80
RV	=	Redemption Value	=	₹ 100
n	=	Period of debenture	=	5 years
t	=	Tax rate	=	35% or 0.35

$(K_d) = \frac{10(1-0.35)+\frac{(100-80)}{5 \text{ years}}}{\frac{(100+80)}{2}}$

Or, $= \frac{10 \text{ x } 0.65 + 4}{90} = \frac{10.5}{90}$ = 0.1166 or 11.67%

PROBLEM 4

Institutional Development Bank (IDB) issued Zero interest deep discount bonds of face value of ₹ 1,00,000 each issued at ₹ 2,500 & repayable after 25 years. COMPUTE the cost of debt if there is no corporate tax.

Solution:

Here,

Redemption Value (RV) = ₹ 1,00,000

Net Proceeds (NP) = ₹ 2,500

Interest = 0

Life of bond = 25 years

There is huge difference between RV and NP therefore in place of approximation method we should use trial & error method.

FV	= PV x $(1 + r)^n$
1,00,000	= 2,500 x $(1 + r)^{25}$
40	= $(1 + r)^{25}$
$40^{1/25}$	= $(1 + r)$
$40^{0.04}$	= $(1 + r)$
r	= 15.91%

PROBLEM 5

RBML is proposing to sell a 5 – year bond of ₹ 5,000 at 8 per cent rate of interest per annum. The bond amount will be amortized equally over its life. CALCULATE the bond's present value for an investor if he expects a minimum rate of return of 6 per cent?

Solution:

Year	Principle	Interest	Total CF	DF @ 6%	DCF
1	1000	400	1400	0.9434	1321
2	1000	320	1320	0.8899	1175
3	1000	240	1240	0.8396	1041
4	1000	160	1160	0.7921	919
5	1000	80	1080	0.7473	807
				TOTAL PV	**5263**

PROBLEM 6

Mr. Mehra had purchased a share of Alpha Limited for ₹ 1,000. He received dividend for a period of five years at the rate of 10 percent. At the end of the fifth year, he sold the share of Alpha Limited for ₹ 1,128. You are required to COMPUTE the cost of equity as per realized yield approach.

Solution:

We know that as per the realized yield approach, cost of equity is equal to the realized rate of return. Therefore, it is important to compute the internal rate of return by trial and error method. This realized rate of return is the discount rate which equates the present value of the dividends received in the past five years plus the present value of sale price of ₹ 1,128 to the purchase price of ₹ 1,000. The discount rate which equalizes these two is 12 percent approximately. Let us look at the table given for a better understanding:

Year	CF	DF@11%	DCF	DF@13%	DCF
0	(1000)	1	(1000)	1	(1000)
1-5	100	3.6958	369.58	3.5172	351.72
5	1128	0.5934	669.36	0.5428	612.28
			38.94		**(36)**

IRR (YTM) = start rate + surplus/ (Surplus + Deficit) x Difference in rate
= 11 + 38.94/ (38.94+36) x 2
= 12.04 %

Therefore, the realized rate of return may be taken as 12 percent. This 12 percent is the cost of equity.

PROBLEM 7

CALCULATE the cost of equity from the following data using realized yield approach:

Year	1	2	3	4	5
Dividend per share	1.00	1.00	1.20	1.25	1.15
Price per share (at the beginning)	9.00	9.75	11.50	11.00	10.60

Solution:

In this question we will first calculate yield for last 4 years and then calculate it geometric mean as follows:

$1 + Y_1 = \frac{\mathbf{D_1 + P_1}}{\mathbf{P_0}} = \frac{\mathbf{1 + 9.75}}{\mathbf{9}}$ = 1.1944

$1 + Y_2 = \frac{\mathbf{D_2 + P_2}}{\mathbf{P_1}} = \frac{\mathbf{1 + 11.50}}{\mathbf{9.75}}$ = 1.2821

$1 + Y_3 = \frac{D_3 + P_3}{P_2} = \frac{1.2 + 11}{11.5}$ = 1.0609

$1 + Y_4 = \frac{D_4 + P_4}{P_3} = \frac{1.25 + 10.60}{11}$ = 1.0772

Geometric mean:

$K_e = [(1 + Y_1) \times (1 + Y_2) \times \ldots\ldots\ldots (1 + Y_n)]^{1/n} - 1$

K_e = [1.1944 x 12821 x 1.0609 x 1.0772]1/4 -1 = 0.15 = 15%

Note: to calculate power ¼ simply press square root switch, two times on your calculator.

PROBLME 8

Face value of equity shares of a company is ₹ 10, while current market price is ₹ 200 per share. Company is going to start a new project, and is planning to finance it partially by new issue and partially by retained earnings. You are required to CALCULATE cost of equity shares as well as cost of retained earnings if issue price will be ₹ 190 per share and floatation cost will be ₹ 5 per share. Dividend at the end of first year is expected to be ₹ 10 and growth rate will be 5%.

Solution:

$K_r = \frac{D_1}{P_0} + g = \frac{10}{200} + .05 = 10\%$

$K_e = \frac{D_1}{P_0} + g = \frac{10}{190-5} + 0.5 = 10.41\%$

If personal tax is also considered then a shortcut formula may be as follows:
$K_r = K_e\ (1 - tp)\ (1 - f)$

Here t_p is rate of personal tax on dividend and "f" is rate of flotation cost.

Here personal income tax means income tax payable on dividend income by equity shareholders. Currently dividend income is not taxable in the hands of investors. Only dividend received in excess of ₹ 10 lakhs by an individual, HUF or firm from domestic company is taxed at the rate of 10%.

PROBLEM 9

Cost of equity of a company is 10.41% while cost of retained earnings is 10%. There are 50,000 equity shares of ₹ 10 each and retained earnings of ₹ 15,00,000. Market price per equity share is ₹ 50. Calculate WACC using market value weights if there are no other sources of finance.

Solution:

Book value of paid up equity capital = ₹ 5,00,000

Book value of retained earnings = ₹ 15,00,000

Ratio Paid up equity capital & retained earnings = 500000:1500000 = 1:3

Market value of paid equity capital & retained earnings = ₹ 50,000 x ₹ 50 = ₹ 25,00,000.

Market value of paid up equity capital = ₹ 25,00,000 x ¼ = ₹ 6,25,000

Market value of retained earnings = ₹ 25,00,000 x ¾ = ₹ 18,75,000

Calculation of WACC using market value weights

Source of capital	Market Value	Weights	Cost of capital	WACC (Ko)
	(₹)	(a)	(b)	(c) = (a) x (b)
Equity shares	6,25,000	0.25	0.1041	0.0260
Retained earnings	18,75,000	0.75	0.1000	0.0750
	25,00,000	1,000		0.1010

WACC (K_o) = 0.1010 o 10.10%

PROBLEM 10

CALCULATE the WACC using the following data by using:

(a) Book value weights

(b) Market value weights

The capital structure of the company is as under:

	(₹)
Debentures (₹ 100 per debenture)	5,00,000
Preference Shares (₹ 100 per share)	5,00,000
Equity shares (₹ 10 per share)	10,00,000
	20,00,000

The market prices of these securities are:

Debentures	₹ 105 per debentures
Preference Shares	₹ 110 per preference
Equity Shares	₹ 24 each

Additional information:

(1) ₹ 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10 – year maturity.

(2) ₹ 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10 year maturity.

(3) Equity shares has ₹ 4 floatation cost and market price ₹ 24 per share.

The next year expected dividend is ₹ 1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.

Corporate tax rate is 30%. Use YTM method to calculate cost of debentures and preference shares.

Solution:

(1) Cost of Equity (K_e)

$$= \frac{D1}{P_0 - F} + g = \frac{1}{24-4} + 0.05 = = 0.1 \text{ or } 10\%$$

(2) Cost of Debt (K_d)

Current market price (P_0) – floatation cost = I (1 – t) x PVAF (r, 10) + RV x PVIF (r, 10)

₹ 105 – 4% of ₹ 105 = ₹ 10 (1 – 0.3) x PVAF (r, 10) + ₹ 100 x PVIF (r, 10)

Calculation of NPV at discount rate of 5% and 7%

Year	Cash flows (₹)	Discount factor @ 5%	Preset Value	Discount factor 7%	Present Value (₹)
0	100.8	1.000	(100.8)	1.000	(100.8)
1 to 10	7	7.722	54.05	7.024	49.17
10	100	0.614	61.40	0.508	50.80
NPV			+14.65		-0.83

Calculation of IRR

IRR $= 5\% + \frac{14.65}{14.65-(-0.83)} (7\% - 5\%) = 5\% + \frac{14.65}{15.48} (7\% - 5\%) = 6.89\%$

Cost of Debt (K_d) = 6.89%

(3) Cost of Preference Shares (K_P)

Current market price (P_0) – floatation cost = PD x PVAF (r, 10) + RV x PVIF (r, 10)

₹ 110 – 2% of ₹ 110 = ₹ 5 x PVAF (r, 10) + ₹ 100 x PVIF (R, 10)

Calculation of NPV at discount rate of 3% and 5%

Year	Cash flows (₹)	Discount factor @ 3%	Present Value	Discount factor @ 5%	Present Value (₹)
0	107.8	1.000	(107.8)	1.000	(107.8)
1 to 10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
NPV			+9.25		-7.79

Calculation of IRR

$$IRR = 3\% + \frac{9.25}{9.25-(-7.79)}(5\% - 3\%) = 3\% + \frac{9.25}{17.04}(5\% - 3\%) = 4.08\%$$

Cost of Preference Shares (K_P) = 4.08%

(a) Calculation of WACC using book value weights

Source of capital	Book Value (₹)	Weights (a)	After tax cost of capital (b)	WACC (Ko) (c) = (a) x (b)
10% Debentures	5,00,000	0.25	0.0689	0.01723
5% Preference Shares	5,00,000	0.25	0.0408	0.0102
Equity Shares	10,00,000	0.50	0.10	0.05000
	20,00,000	1.00		0.07743

WACC (K_o) 0.07743 or 7.74%

(b) Calculation of WACC using market value weights

Source of Capital	Market Value	Weights	After tax cost of capital	WACC (K_o)
10% Debentures (₹ 105 x 5,000)	5,25,000	0.151	0.0689	0.0104
5% Preference shares (₹ 110 x 5,000)	5,50,000	0.158	0.0408	0.0064
Equity shares (₹ 24 x 1,00,000)	24,00,000	0.691	0.10	0.0691
	34,75,000	1.000		0.0859

WACC (Ko) = 0.0859 or 8.59%

PROBLEM 11

ANC Company's equity share is quoted in the market at ₹ 25 per share currently. The company pays a dividend of ₹ 2 per share and the investor's market expects a growth rate of 6% per year.

You are required to:

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

(ii) If the company issues 10% debentures of face value of ₹ 100 each and realizes ₹ 96 per debentures while the debentures are redeemable after 12 years at a premium of 12%, CALCULATE cost of debenture Using YTM?

Solution:

(i) Cost of Equity Capital (K_e):

$$K_e = \frac{\text{Expected dividend per share (D1)}}{\text{Market price per share } (P_0)} + \text{Growth rate (g)}$$

$$= \frac{\text{Rs. 2 x 1.06}}{\text{Rs. 25}} + 0.06 = 0.1448 \text{ or } 14.48\%$$

(ii) Cost of Debenture (K_d):

Using Present Value method or YTM

Identification of relevant cash flows

Year	Cash Flows
0	Current market price (P_0) = ₹ 96
1 to 12	Interest net of tax [I(1 – t)] = 10% of ₹ 100 (1 – 0.5) = ₹ 5
12	Redemption value (RV) = ₹ 100(1.12) = ₹ 112

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

Year	Cash flows	Discount factor @ 5% (L)	Present Value	Discount factor @ 10% (H)	Present Value
0	(96)	1.000	(96.00)	1.000	(96.00)
1 to 12	5	8.863	44.32	6.814	34.07
12	112	0.557	62.38	0.319	35.73
NPV			+ 10.7		- 26.2

Calculation of IRR

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

$$= 5\% + \frac{10.7}{10.7 - (-26.2)}(10\% - 5\%) = 5\% + \frac{53.5}{36.9} = 6.45\%$$

Therefore, K_d = 6.45%

Assume Tax Rate to be 50%.

PROBLEM 12

Masco Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / equity mix	3:7
(2)	Cost of debt Upto ₹ 1,80,000 Beyond ₹ 1,80,000	10% (before tax) 16% (before tax)
(3)	Earnings per share	₹ 4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate in dividend	10%
(6)	Current market price per share	₹ 44
(7)	Tax rate	50%

You are required:

(a) To DETERMINE the pattern for raising the additional finance.

(b) To DETERMINE the post – tax average cost of additional debt.

(c) To DETERMINE the cost of retained earnings and cost of equity, and

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

Solution:

(a) Pattern of raising additional finance

Equity 70% of ₹ 10,00,000 = ₹ 7,00,000

Debt 30% of ₹ 10,00,000 = ₹ 3,00,000

The capital structure after raising additional finance:

	(₹)
Shareholders' fund	
Equity Capital (7,00,000 – 2,10,000)	4,90,000
Retained earnings	2,10,000
Debt (Interest at 10% p.a.)	1,80,000
(Interest at 16% p.a.) (3,00,000 – 1,80,000)	1,20,000
Total Funds	**10,00,000**

(b) Determination of post – tax average cost of additional debt $K_d = I(1 – t)$

Where,

I = Interest Rate

t = Corporate tax – rate

On ₹ 1,80,000 = 10% (1 – 0.5) = 5% or 0.05

On ₹ 1,20,000 = 16% (1 – 0.5) = 8% or 0.08

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

$K_e = \frac{D1}{P_0} + g$

Where,

K_e = Cost of equity

$D_1 = D_0 (1 + g)$

D_0 = Dividend paid (i.e., 50% of EPS = 50% x ₹ 4 = ₹ 2)

g = Growth rate = 10%

P_0 = Current market price per share = ₹ 44

Then, $K_e = \frac{2.2}{44} + 0.10 = 0.05 + 0.10 = 0.15 = 15\%$

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

Source of finance	**Amount**	**Weights**	**Cost of funds**	**Weighted Cost (%)**
Equity (including retained earnings)	7,00,000	0.70	15%	10.5
Debt @10%	1,80,000	0.18	5%	0.90
Debt @ 16%	1,20,000	0.12	8%	0.96
	10,00,000		WACC	12.36

PROBLEM 13

DETERMINE the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:

Sources	Book Value	Market Value
	(₹)	(₹)
Equity Shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	---
Preference shares	36,00,000	33,75,000
Debentures	9,00,000	10,40,000

Additional information:

(i) Equity: Equity shares are quoted at ₹ 130 per share and a new issue priced at ₹ 125 per share will be fully subscribed; floatation costs will be ₹ 5 per share.

(ii) Dividend: During the previous 5 years, dividends have steadily increased from ₹ 10.60 to ₹ 14.19 per share. Dividend at the end of the current year is expected to be ₹ 15 per share.

(iii) Preference shares: 15% Preference shares with face value of ₹ 100 would realize ₹ 105 per share.

(iv) Debentures: The company proposes to issue 11 year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2%.

(v) Tax: Corporate tax rate is 35%. Ignore dividend tax. Floatation cost would be calculated on face value.

Solution:

i) Cost of Equity (K_e) = $\frac{D_1}{P_0 - F} + g = \frac{15}{125-5} + 0.06$ (refer to working note)

$K_e = 0.125 + 0.06 = 0.185$

Working Note: Calculation of 'g'

₹ 10.6 $(1 + r)5$ = ₹ 14.19

r = 6%. Therefore, g is 6 per cent.

ii) Cost of Retained Earnings (K_r) = $\frac{D_1}{P_0} + g = \frac{15}{130} + 0.06 = 0.1754$

iii) Cost of Preference Shares (K_p) = $\frac{PD}{P_0} = \frac{15}{105} = 0.1429$

iv) Cost of Debenture (K_d) $= \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$

$= \frac{15(1 - 0.35) + (100 - 91.75*)/11 \text{ years}}{\frac{100+91.75*}{2}}$

$= \frac{15 \times 0.65 + 0.75}{95.875} = \frac{10.5}{95.875} = 0.1095$

* Since yield on similar type of debentures is 16 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

= ₹ 15 ÷ 0.16 = ₹ 93.75

Sale Proceeds from debentures = ₹ 93.75 - ₹ 2 (i.e. floatation cost) = ₹ 91.75

Market value (P_0) of debentures can also be found out using the present value method.

P_0 = Annual Interest x PVIFA (16%, 11 years) + Redemption value x PVIF (16%, 11 years)

P_0 = ₹ 15 x 5.029 + ₹ 100 x 0.195

Net Proceeds = ₹ 94.935 – 2% of ₹ 100 = ₹ 92.935

Accordingly, the cost of debt can be calculated

Cost of capital (amount in lakh of rupees)

[BV weights and MV weights]

Source of capital	Weights		Specific Cost (K)	Total Cost	
	BV	MV		(BV x K)	(MV x K)
Equity Shares	120	160*	0.1850	22.2	29.6
Retained Earnings	30	40*	0.1754	5.262	7.016
Preference Shares	36	33.75	0.1429	5.14	4.82
Debentures	9	10.4	0.1095	0.986	1.139
Total	195	244.15		33.588	42.575

*Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings

Weighted Average Cost of Capital (WACC):

Using Book Value $= \frac{33.588}{195} = 0.1722$ or 17.22%

Using Market Value $= \frac{42.575}{244.15} = 0.1744$ or 17.44%

PROBLEM 14

The Following is the extract of the balance sheet of M/s. KD Ltd.:

Particulars	Amount (₹)
Ordinary shares (Face Value ₹ 10/- per share)	5,00,000
Share premium	1,00,000
Retained Profits	6,00,000
8 % Preference share (Face Value ₹ 25/- per share)	4,00,000
12% Debentures (Face Value ₹ 100/- each)	6,00,000
	22,00,000

The ordinary shares are currently priced at ₹ 39 ex-dividend and preference share is priced at ₹ 18 cum-dividend. The debentures are selling at ₹ 120 percent ex-interest. The applicable tax rate to KD Ltd. is 30 percent. KD Ltd.'s cost of equity has been estimated at 19 percent. Calculate the WACC (weighted average cost of capital) of KD Ltd. on the basis of market value.

Solution:

K_e = 19%

$K_d = \frac{12(1-0.3)}{120}$ x 100 = 7%

$K_p = \frac{2}{18-(25 \times 8\%)} \times 100 = \frac{2}{16} \times 100$

$= 12.5\%$

Calculation of WACC using Market Value Weights.

Source of finance	Amount	Proportion	Individual Cost	Product
Equity share capital (50,000 x 39)	19,50,000	66.64	19%	12.66
Preference share capital (16000 x 16)	256000	8.75	12.5%	1.09375
Debentures (6000 x 120)	720,000	24.61	7%	1.7227
	29,26000			15.47%

PROBLEM 15

Bounce Ltd. evaluates all its capital projects using discounting rate of 15%. Its capital structure consists of equity share capital, retained earnings, bank term loan and debentures redeemable at par. Rate of interest on bank term loan is 1.5 times that of debenture. Remaining tenure of debenture and bank loan is 3years and 5 years respectively. Book value of equity share capital, retained earnings and bank loan is ₹ 10,00,000, ₹ 15,00,000 and ₹ 10,00,000 respectively. Debentures which are having book value of ₹ 15,00,000 are currently trading at ₹ 97 per debenture. The ongoing P/E multiple for the shares of the company stands at 5. You are required to CALCULATE the rate of interest on bank loan and debentures if tax rate applicable is 25%.

Solution:

Let the rate of Interest on debenture be x

∴ Rate of Interest on loan = 1.5x

∴ Kd on debentures $= \frac{\text{Int}\,(1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{2}}$

$= \frac{100x(1-0.25)+\frac{100-97}{3}}{\frac{100+97}{2}}$

$= \frac{75x + 1}{98.5}$

∴ Kd on bank loan = 1.5x (1 – 0.25) = 1.125x

∴ Ke $= \frac{EPS}{MPS} = \frac{1}{MPS/EPS} = \frac{1}{P/E} = \frac{1}{5} = 0.2$

Kr = Ke = **0.2**

Computation of WACC

Capital	Amount (₹)	Weights	Cost	Product
Equity	10,00,000	0.2	0.2	0.04
Reserves	15,00,000	0.3	0.2	0.06
Debentures	15,00,000	0.3	(75x+1)/98.5	(22.5x + 0.3)/98.5
Bank Loan	10,00,000	0.2	1.125x	0.225x
	50,00,000	1		$0.1 + 0.225x + \frac{22.5x+0.3}{98.5}$

WACC = 15%

∴ $0.1 + 0.225x + \frac{22.5x}{98.5} + \frac{0.3}{98.5} = 0.15$

∴ 9.85 + 22.1625x +22.5x + 0.3 = (0.15) (98.5)

∴ 44.6625x = 14.775 – 9.85 – 0.3

∴ 44.6625x = 4.625

∴ x = $\frac{4.625}{44.6625}$

∴ x = 10.36 %

∴ Rate of interest on debenture = x = 10.36%

Rate of interest on Bank loan = 1.5x = (1.5) (10.36%) = 15.54%

PROBLEM 16

The capital structure of a Company is given below:

Source of capital	Book Value (₹)
Equity shares @ ₹ 100 each	24,00,000
9% Cumulative preference shares @ ₹ 100 each	4,00,000
11% Debentures	12,00,000
	40,00,000

The company had paid equity dividend @ 25% for the last year which is likely to grow @ 5% every year.

The current market price of the company's equity share is ₹ 200.

Considering corporate tax @ 30%, you are required to CALCULATE:

(i) Cost of capital for each source of capital.

(ii) Weighted average cost of capital.

Solution:

(i) Calculation of Cost of Capital for each source of capital:

(a) Cost of Equity share capital:

$K_e = \frac{D_0(1-g)}{\text{Market Priceper share}(P_0)} + g = \frac{25\% \text{ x Rs.}100(1+0.05)}{\text{Rs. } 200} + 0.05$

$= \frac{\text{Rs.}26.25}{\text{Rs. } 200} + 0.05 = 0.18125\% \text{ or } 18.125\%$

(b) Cost of Preference share capital (K_p) = 9%

(c) Cost of Debentures (K_d) = r (1 – t)

= 11% (1 – 0.3) = 7.7%

(ii) Weighted Average Cost of Capital

Source	Amount (₹)	Weights (a)	After tax Cost of Capital (%) (b)	WACC (%) (c) = (a) x (b)
Equity share	24,00,000	0.60	18.125	10.875
9% Preference share	4,00,000	0.10	9.000	0.900
11% Debentures	12,00,000	0.30	7.700	2.310
	40,00,000	1.00		14.085

PROBLEM 17

Kalyanam Ltd. has an operating profit of ₹ 34,50,000 and has employed Debt which gives total Interest Charge of ₹ 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of ₹ 75 Lakhs and is expected to bring an additional profit of ₹ 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

(i) Before the new Proposal

(ii) After the new Proposal.

Solution:

Workings:

(a) Value of Debt $= \frac{\text{Interest}}{\text{Cost of debt } (K_d)}$

$= \frac{\text{Rs.7,50,000}}{0.08} =$ ₹ 93,75,000

(b) **Value of equity capital** $= \frac{\text{Operating profit – Interest}}{\text{Cost of equity } (K_e)}$

$= \frac{\text{RS.34,50,000– Rs.7,50,000}}{0.16}$

= ₹ 1,68,75,000

(c) New Cost of equity (K_e) after proposal

$= \frac{\text{Increased Operating profit – Interest on Increased debt}}{\text{Equity capital}}$

$= \frac{(\text{Rs.34,50,000} + \text{Rs.14,25,000}) - (\text{Rs.7,50,000} + \text{Rs.6,00,000})}{\text{Rs.1,68,75,000}}$

$= \frac{\text{Rs.48,75,000 – Rs.13,50,000}}{\text{Rs.1,68,75,000}}$

$= \frac{\text{Rs.35,25,000}}{\text{Rs.1,68,75,000}}$

= 0.209 or 20.9%

(i) Calculation of Weighted Average Cost of Capital (WACC) before the new proposal

Sources	(₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.6429	0.160	0.1029
Debt	93,75,000	0.3571	0.080	0.0286
Total	**2,62,50,000**	**1**		**0.1315 or 13.15 %**

(ii) Calculation of Weighted Average Cost of Capital (WACC) after the new proposal

Sources	(₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.5000	0.209	0.1045
Debt	1,68,75,000	0.5000	0.080	0.0400
Total	**3,37,50,000**	**1**		**0.1445 or 14.45 %**

PROBLEM 18

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 years 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%.

(i) CALCULATE the cost of convertible debentures using the approximation method.

(ii) 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

Solution:

(i) Calculation of Cost of Convertible Debentures:

Given that, R_F = 10%

$R_m - R_f$ = 18%

B = 1.25

D_0 = 12.76

D_5 = ₹ 10

Flotation Cost = 5%

Using CAPM,

K_e = $R_f + \beta (R_m - R_f)$

= 10%+1.25 (18%)

= 32.50%

Calculation of growth rate in dividend

12.76 = $10 (1 + g)^5$

1.276 = $(1 + g)^5$

$(1+5\%)^5$ = 1.276 ---------- from FV Table

g = 5%

Price of share after 6 years = $\frac{D_7}{k_e - g} = \frac{12.76(1.05)^7}{0.325 - 0.05}$

P_6 = $\frac{12.76 \times 1.407}{0.275}$

P_6 = 65.28

Redemption Value of Debenture (RV) = 65.28 x 2 = 130.56 (RV)

NP = 95

n = 6

$K_d = \frac{Int\ (1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100$

$= \frac{15\ (1-0.4)+\frac{(130.56-95)}{6}}{\frac{130.56+95}{2}} \times 100$

$= \frac{9+5.93}{112.78} \times 100$

K_d = 13.24%

(ii) Calculation of Cost of Preference Shares:

Net Proceeds = 100 (1.1) - 6% of 100 (1.1)

= 110 - 6.60

= 103.40

Redemption Value = 100

Year	Cash Flows (₹)	PVF @ 3%	PV (₹)	PVF @ 5%	PV (₹)
0	(103.40)	1	(103.40)	1	(103.40)
1-10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
			13.65		**-3.39**

$K_p = 3\ \% + \frac{13.65}{[13.65-(-3.39)]} \times 5\% - 3\%$

$= 3\% + \frac{13..65}{17.04} \times 2\ \%$

K_p = 4.6021%

CHAPTER 5 FINANCIAL ANALYSIS AND PLANNING RATIO ANALYSIS

PROBLEM 1

In a meeting held at Solan towards the end of 2022, the Directors of M/s. HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01.01.2023 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:

INCOME STATEMENTS

Particulars	2022 (₹)		2023 (₹)	
Cash Sales	30,000		32,000	
Credit Sales	2,70,000	3,00,000	3,42,000	3,74,000
Less: Cost of goods sold		2,36,000		2,98,000
Gross Profit		64,000		76,000
Less: Operating Expenses				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	
Selling	11,000	49,000	14,000	57,000
Net Profit		15,000		19,000

BALANCE SHEET

Particulars	2022 (₹)		2023 (₹)	
Fixed Assets (Net Block)	---	30,000	---	40,000
Receivables	50,000		82,000	
Cash at Bank	10,000		7,000	
Stock	60,000		94,000	
Total Current Assets (CA)	1,20,000		1,83,000	
Payables	50,000		76,000	
Total Current Liabilities (CL)	50,000		76,000	
Working Capital (CA – CL)		70,000		1,07,000
Total Assets		1,00,000		1,47,000
Represented by:				
Share Capital		75,000		75,000
Reserve and Surplus		25,000		42,000
Debentures		---		30,000
		1,00,000		1,47,000

You are required to CALCULATE the following ratios for the years 2022 and 2023.

(i) Gross Profit Ratio

(ii) Operating Expenses to Sales Ratio.

(iii) Operating Profit Ratio

(iv) Capital Turnover Ratio

(v) Stock Turnover Ratio

(vi) Net Profit to Net Worth Ratio, and

(vii) Receivables Collection Period.

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of ₹ 40,000 for the year 2022. Ignore Taxation.

Solution:

Computation of Ratios		
Ratio	**2022 (₹)**	**2023 (₹)**
1. Gross profit ratio (Gross profit/sales)	$\frac{64,000 \times 100}{3,00,000}$ = 21.3%	$\frac{76,000 \times 100}{3,74,000}$ = 20.3%
2. Operating expense to sales ratio (Operating exp/Total sales)	$\frac{49,000 \times 100}{3,00,000}$ = 16.3%	$\frac{57,000 \times 100}{3,74,000}$ = 15.2%
3. Operating profit ratio (Operating profit / Total sales)	$\frac{15,000 \times 100}{3,00,000}$ = 5%	$\frac{19,000 \times 100}{3,74,000}$ = 5.08%
4. Capital turnover ratio (Sales / Capital Employed)	$\frac{3,00,000}{1,00,000}$ = 3	$\frac{3,74,000}{1,74,000}$ = 2.54
5. Stock turnover ratio (COGS / Average Stock)	$\frac{2,36,000}{50,000}$ = 4.72	$\frac{2,98,000}{77,000}$ = 3.87
6. Net Profit to Networth (Net profit / Networth)	$\frac{15,000 \times 100}{1,00,000}$ = 15%	$\frac{19,000 \times 100}{1,17,000}$ = 16.24%
7. Receivables collection period (Average receivables / Average daily credit sales) (Refer to working note)	$\frac{50,000}{739.73}$ = 67.6 days	$\frac{82,000}{936.99}$ = 87.5 days
Working Note: Average daily sales = Credit sales / 365	$\frac{2,70,000}{365}$ = 739.73	$\frac{3,42,000}{365}$ = 936.99

Analysis: The decline in the Gross profit ratio could be either due to a reduction in the selling price or increase in the direct expenses (since the purchase price has remained the same). In this case, cost of goods sold have increased more than proportion of increment in sales & hence impacting gross profit ratio.

Similarly, there is a decline in the ratio of operating expenses to sales. Further analysis reveals although that in comparison to increase in sales, there has a lesser proportionate increase in operating expenses. As a result, even the operating profit ratio has remained the same in spite of a decline in the Gross profit margin ratio.

The company has not been ablet to deploy its capital efficiently. This is indicated by a decline in the Capital turnover from 3 to 2.5 times.

The decline in stock turnover ratio implies that the company has increase its investment in stock. Net profit to Net worth ratio has increased indicating that the company's net worth or shareholder's capital is efficient in generating profits. The increase in the Average collection period indicates that the company has become liberal in extending credit on sales. There is a corresponding increase in the receivables due to such a policy.

PROBLEM 2

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

SOLUTION

The net profit is calculated as follows:

Particulars	₹	₹
Sales (150% of ₹ 4,80,000)		7,20,000
Direct Costs		4,80,000
Gross profit	80,000	2,40,000
Operating expenses	32,000	
Interest Changes (8% of ₹ 4,00,000)		1,12,000
Profit before taxes		1,28,000
Taxes (@ 50%)		64,000
Net profit after taxes		64,000

(i) Net profit margin $= \frac{\text{Profit after taxes}}{\text{Sales}} = \frac{\text{Rs.64,000}}{\text{Rs.7,20,000}} = 0.89$ or 8.9%

Net profit margin $= \frac{\text{EBIT}(1-t)}{\text{Sales}} = \frac{\text{Rs.1,60,000}(1-0.5)}{7,20,000} = 0.111$ or 11.1%

(ii) Return on assets $= \frac{\text{EBIT}(1-t)}{\text{Assets}} = \frac{\text{Rs.1,60,000}(1-0.5)}{8,00,000} = 0.10$ or 10%

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

(iv) Return on equity $= \frac{\text{Net Profit after taxes}}{\text{Owners equity}} = \frac{\text{Rs.64,000}}{\text{50\% of Rs.8,00,000}}$

$= \frac{\text{Rs,.64,000}}{\text{Rs.4,00,000}} = 0.16$ or 16%

PROBLEM 3

ABC Company sells plumbing fixtures on terms of 2/10, net 30. Its financial statements over the last 3 years are as follows:

Particulars	2021	2022	2023
	₹	₹	₹
Cash	30,000	20,000	5,000
Accounts receivable	2,00,000	2,60,000	2,90,000
Inventory	4,00,000	4,80,000	6,00,000
Net fixed assets	8,00,000	8,00,000	8,00,000
	14,30,000	**15,60,000**	**16,95,000**
	₹	₹	₹
Accounts payable	2,30,000	3,00,000	3,80,000
Accruals	2,00,000	2,10,000	2,25,000
Bank – term debt	1,00,000	1,00,000	1,40,000
Long – term debt	3,00,000	3,00,000	3,00,000
Common Stock	1,00,000	1,00,000	1,00,000
Retained earnings	5,00,000	5,50,000	5,50,000
	14,30,000	**15,60,000**	**16,95,000**
	₹	₹	₹
Sales	40,00,000	43,00,000	38,00,000
Cost of goods sold	32,00,000	36,00,000	33,00,000
Net profit	3,00,000	2,00,000	1,00,000

ANALYSE the company's financial condition and performance over the last 3 years. Are there any problems?

Solution:

Ratios	2021	2022	2023
Current ratio	1.19	1.25	1.20
Acid – test ratio	0.43	0.46	0.40
Average collection period	18	22	27
Inventory turnover	NA*	8.2	6.1
Total debt to net worth	1.38	1.40	1.61
Long – term debt to total capitalization	0.33	0.32	0.32
Gross profit margin	0.200	0.163	0.132
Net profit margin	0.075	0.047	0.026
Asset turnover	2.80	2.76	2.24
Return on assets	0.21	0.13	0.06

Analysis: The company's profitability has declined steadily over the period. As only ₹ 50,000 is added to retained earnings, the company must be paying substantial dividends. Receivables are growing slower, although the average collection period is still very reasonable relative to the terms given. Inventory turnover is slowing as well, indicating a relative buildup in inventories. The increase in receivables and inventories, coupled with the fact that net worth has increased very little, has resulted in the total debt – to – worth ratio increasing to what would have to be regarded on an absolute basis as a high level.

The current and acid – test ratios have fluctuated but the current ratio is not particularly inspiring. The lack of deterioration in these ratios is clouded by the relative build up in both receivables and inventories, evidencing deterioration in the liquidity of these two assets. Both the gross profit and net profit margins have declined substantially. The relationship between the two suggests that the company has increased relative expenses in 2022 in particular. The build – up in inventories and receivables has resulted in a decline in the asset turnover ratio, and this, coupled with the decline in profitability, has resulted in a sharp decrease in the return on assets ratio.

PROBLEM 4

Following information are available for Navya Ltd. along with various ratio relevant for the particulars industry it belongs to. APPRAISE your comments on strength and weakness of Navya Ltd. comparing its rations with the given industry norms.

Navya Ltd.

BALANCE SHEET AS AT 31.3.2023

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital	48,00,000	Fixed	24,20,000
10% Debentures	9,20,000	Assets Cash	8,80,000
Other current Liabilities	6,60,000	Sundry debtors	11,00,000
Sundry Creditors	8,80,000	Stock	33,00,000
Bills Payable	4,40,000		---
Total	77,00,000	Total	77,00,000

STATEMENT OF PROFITABILITY FOR THE YEAR ENDING 31.3.2023

Particulars	Amount (₹)	Amount (₹)
Sales		1,10,00,000
Less: Cost of goods sold:	---	---
Material	41,80,000	---
Wages	26,40,000	---
Factory Overhead	12,98,000	81,18,000
Gross Profit		28,82,000
Less: Selling and Distribution	11,00,000	
Cost Administrative Cost	12,28,000	23,28,000
Earnings before Interest and Taxes		5,54,000
Less: Interest Charges		92,000
Earning before Tax		4,62,000
Less: Taxes & 50%		2,31,000
Net Profit (PAT)		**2,31,000**

INDUSTRY NORMS

Ratios	Norm
Current Ratio	2.5
Receivables Turnover Ratio	8.0
Inventory Turnover Ratio (based on Sales)	9.0
Total Assets Turnover Ratio	2.0
Net Profit Ratio	3.5%
Return on Total Assetss	7.0%
Return on Net worth (Based on Net Profit)	10.5%
Total Debt/Total Assets	60.0%

Solution:

Ratios	Navya Ltd.	Industry Norms
1. Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$	$\frac{52,80,000}{19,80,000}$ = 2.67	2.50
2. Receivable Turnover Ratio = $\frac{\text{Sales}}{\text{Debtors}}$	$\frac{1,10,00,000}{11,00,000}$ = 10.0	8.00
3. Inventory turnover ratio = $\frac{\text{Sales}}{\text{Stock}}$	$\frac{1,10,00,000}{33,00,000}$ = 3.33	9.00
4. Total Asset Turnover ratio = $\frac{\text{Sales}}{\text{Total Assets}}$	$\frac{1,10,00,000}{77,00,000}$ = 1.43	2.00
5. Net Profit Ratio = $\frac{\text{Net Profit}}{\text{Sales}}$	$\frac{2,31,000}{1,10,00,000}$ = 2.10%	3.50%
6. Return on Total Asset = $\frac{\text{Net Profit}}{\text{Total Assets}}$	$\frac{2,31,000}{77,00,000}$ = 3.00%	7%
7. Return on Net worth (Based on Net profit) = $\frac{\text{Net Profit}}{\text{Net Worth}}$	$\frac{2,31,000}{48,00,000}$ = 4.81%	10.5%
8. $\frac{\text{Total Debt}}{\text{Total Assets}}$	$\frac{29,00,000}{77,00,000}$ = 37.66%	60%

Comments:

1. The position of Navya Ltd. is better than the industry norm with respect to Current Ratios and the Sales to Debtors Ratio.
2. However, the position of sales to stock and sales to total assets is poor comparing to industry norm.
3. The firm also has its net profit ratios, net profit to total assets and net profit to total worth ratio much lower than the industry norm.
4. Total debt to total assets ratio suggest that, the firm is geared at lower level.

PROBLEM 5

The total sales (all credit) of a firm are ₹ 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm's current liabilities are ₹ 96,000; inventories ₹ 48,000 and cash ₹ 16,000.

(a) DETERMINE the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume a 360 days year).

(b) DETERMINE the average collection period if the opening balance of debtors is intended to be of ₹ 80,000 (Assume 360 day year).

Solution:

(a) Inventory turnover = $\frac{\text{Cost of goods sold}}{\text{Average inventory}}$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.
Cost of goods sold = 0.85 x ₹ 6,40,000 = ₹ 5,44,000

Thus, = $\frac{5,44,000}{\text{Average Inventory}}$ = 5

Average inventory = $\frac{5,44,000}{5}$ = ₹ 1,08,800

(b) Average collection period = $\frac{\text{Average Receivables}}{\text{Credit Sales per day}}$

Average Receivables = $\frac{(\text{Opening Receivables} + \text{Closing Receivables})}{2}$

Closing balance of receivables is found as follows:

	₹	₹
Current assets (2.5 of current liabilities) Less:		2,40,000
Inventories	48,000	
Cash	16,000	64,000
∴ Receivables		1,76,000

Average Receivables = $\frac{(1,76,000 + 80,000)}{2}$ = ₹ 2,56,000 ÷ 2 = ₹ 1,28,000

Average collection period = $\frac{1,28,000}{6,40,000/360}$ = 72 days

PROBLEM 6

The capital structure of Beta Limited is as follows:

Equity share capital of ₹ 10 each	8,00,000
9% Preference share capital of ₹ 10 each	3,00,000
	11,00,000

Additional information: Profit (after tax at 35 per cent), ₹ 2,70,000; Depreciation, ₹ 60,000; Equity dividend paid, 20 per cent; Market price of equity shares, ₹ 40.

You are required to COMPUTE the following, showing the necessary workings:

(a) Dividend yield on the equity shares

(b) Cover for the preference and equity dividends

(c) Earnings per shares

(d) Price – earnings ratio.

Solution:

(a) Dividend yield on the equity shares

$$= \frac{\text{Dividend per share}}{\text{Market Price per share}} \text{ x } 100 = \frac{2\ (20\% \text{ x } 10)}{40} \text{ x } 100 = 5 \text{ percent}$$

(b) Dividend coverage ratio

(i) Preference $= \dfrac{\text{Profit after taxes}}{\text{Dividend payable to preference shareholders}}$

$$= \frac{2,70,000}{27,000\ (9\% \text{ x } 3,00,000} = 10 \text{ times}$$

(ii) Equity $= \dfrac{\text{Profit after taxes – Preference Share Dividend}}{\text{Dividend payable to equity shareholders at current rate of 2 per share}}$

$$= \frac{2,70,000 - 27,000}{1,60,000\ (80,000 \text{ shares x } 2)} = 1.52 \text{ times}$$

(c) Earnings per equity share $= \dfrac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares outstanding}}$

$$= \frac{2,43,000}{80,000} = ₹\ 3.04 \text{ per share}$$

(d) Price – earning (P/E) ratio $= \dfrac{\text{Market price per share } 40}{\text{Earnings per share } 3.04} = 13.16 \text{ times}$

PROBLEM 7

The following accounting information and financial ratios of PQR Ltd. relate to the year ended 31st March, 2023

I	Accounting Information:	
	Gross Profit	15% of Sales
	Net Profit	8% of sales
	Raw materials consumed.	20% of works cost.
	Direct Wages	10% of works cost.
	Stock of raw materials	3 month's usage
	Stock of finished goods	6% of works cost.
	Debt collection period	60 days
	(All sales are on credit)	
II	Financial Ratios:	
	Fixed assets to sales	1:3
	Fixed assets to Current assets	13:11
	Current ratio	2:1
	Long term loans to Current liabilities	2:1
	Capital to Reserves and Surplus	1:4

If value of Fixed Assets as on 31st March, 2023 amounted to ₹ 26 lakhs, PEPARE a summarized Profit and Loss Account of the year ended 31st March, 2023 and also the Balance Sheet as on 31st March, 2023.

Solution:

(a) Working Notes:

(i) Calculation of Sales = $\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$

$\therefore \frac{26,00,000}{\text{Sales}} = \frac{1}{3} \rightarrow$ Sales = ₹ 78,00,000

(ii) Calculation of Current Assets

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

$\therefore \frac{26,00,000}{\text{Current Assts}} = \frac{13}{11} \rightarrow$ Current Assets = ₹ 22,00,000

(iii) Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	78,00,000
Less: Gross Profit Works	11,70,000
Cost or COGS	66,30,000

Raw Material Consumption (20% of Works Cost) ₹ 13,26,000
Direct Wages (10% of Works Cost) ₹ 6,63,000

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

= 13,26,000 x $\frac{3}{12}$ = ₹ 3,31,500

(v) Calculation of Stock of Finished Goods (6% of Works Cost)
= 66,30,000 x 6% = ₹ 3,97,800

(vi) Calculation of Current Liabilities

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

$$\therefore \frac{22,00,000}{\text{Current Liabilities}} = 2 \rightarrow \text{Current Liabilities} = ₹\ 11,00,000$$

(vii) Calculation of Receivables

$$\text{Average collection period} = \frac{\text{Receivables}}{\text{Credit Sales}} = 365$$

$$\frac{\text{Receivables}}{78,00,000} \text{ x } 365 = 60 \rightarrow \text{Receivables} = ₹\ 12,82,191.78 \text{ or } ₹\ 12,82,192$$

(viii) Calculation of Long term Loan

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

$$\frac{\text{Long term Loan}}{11,00,000} = 2 \rightarrow \text{Long term loan} = ₹\ 22,00,000.$$

(ix) Calculation of Cash Balance

		₹
Current assets		22,00,000
Less: Receivables	12,82,192	
Raw Materials Stock	3,31,500	
Finished goods Stock	3,97,800	
		20,11,492
Cash balance		1,88,508

(x) Calculation of Net worth

Fixed Assets Current		26,00,000
Assets		22,00,000
Total Assets		48,00,000
Less: Long term Loan	22,00,000	
Current Liabilities	11,00,000	33,00,000
Net worth		15,00,000

Net worth = Share Capital + Reserves = 15,00,000

$$= \frac{\text{Capital}}{\text{Reserves and Surplus}} = \frac{1}{4} \rightarrow \text{Share Capital}$$

Share Capital = 15,00,000 x $\frac{1}{5}$ = ₹ 3,00,000

Reserves and Surplus = 15,00,000 x $\frac{4}{5}$ = ₹ 12,00,000

Profit and Loss Account of PQR Ltd.
for the year ended 31st March, 2023

Particulars	₹	Particulars	₹
To Direct Materials	13,26,000	By Sales	78,00,000
To Direct Wages	6,63,000		
To Works (Overhead) (Balancing figure)	46,41,000		
To Gross Profit c/d (15% of Sales)	11,70,000		
	78,00,000		78,00,000
To Selling and Distribution Expenses (Balancing figure)	5,46,000	By Gross Profit b/d	11,70,000
To Net Profit (8% of Sales)	6,24,000		
	11,70,000		11,70,000

Balance Sheet of PQR Ltd.
as at 31st March, 2023

Liabilities	₹	Assets	₹
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets:	
Long term loans	22,00,000	Stock of Raw Material	3,31,500
Current liabilities	11,00,000	Stock of Finished Goods	3,97,800
		Receivables	12,82,192
		Cash	1,88,508
	48,00,000		48,00,000

PROBLEM 8

Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2023.

Sales	₹ 60,00,000
Return on net worth	25%
Rate of income tax	50%
Share capital to reserves	7:3
Current ratio	2
Net profit to sales	6.25%
Inventory turnover (based on cost of goods sold)	12
Cost of goods sold	₹ 18,00,000
Interest on debentures	₹ 60,000
Receivables	₹ 2,00,000
Payables	₹ 2,00,000

You are required to:

(a) CALCULATE the operating expenses for the year ended 31st March, 2023.

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

Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
Share Capital		Fixed Assets	
Reserve and Surplus		Current Assets	
15% Debentures		Stock	
Payables		Receivables	
		Cash	

Solution:

(a) Calculation of Operating Expenses for the year ended 31st March, 2023.

		(₹)
Net Profit [@ 6.25 % of Sales]		3,75,000
Add: Income Tax (@ 50%)		3,75,000
Profit Before Tax (PBT)		7,50,000
Add: Debenture Interest		60,000
Profit before interest and tax (PBIT)		8,10,000
Sales		60,00,000
Less: Cost of goods sold	18,00,000	
PBIT	8,10,000	26,10,000
Operating Expenses		33,90,000

(b) Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
Share Capital	10,50,000	Fixed Assets	17,00,000
Reserve and Surplus	4,50,000	Current Assets	
15% Debentures	4,00,000	Stock	1,50,000
Payables	2,00,000	Receivables	2,00,000
		Cash	50,000
	21,00,000		21,00,000

Working Notes:

(i) Share Capital and Reserves

The return on net worth is 25%. Therefore, the profit after tax of ₹ 3,75,000 should be equivalent to 25% of the net worth.

Net worth x $\frac{25}{100}$ = ₹ 3,75,000

∴ Net worth = $\frac{3,75,000 \text{ x } 100}{25}$ = ₹ 15,00,000

The ratio of share capital to reserves is 7:3

Share Capital = 15,00,000 x $\frac{7}{10}$ = ₹ 10,50,000

Reserves = 15,00,000 x $\frac{3}{10}$ = ₹ 4,50,000

(ii) Debentures

Interest on Debentures @ 15% = ₹ 60,000

∴ Debentures $= \frac{60,000 \times 100}{15} =$ ₹ 4,00,000

(iii) Current Assets

Current Ratio = 2

Payables = ₹ 2,00,000

∴ Current Assets = 2 Current liabilities = 2 x 2,00,000 = ₹ 4,00,000

(iv) Fixed Assets

Liabilities	₹
Share Capital	10,50,000
Reserves	4,50,000
Debentures	4,00,000
Payables	2,00,000
	21,00,000
Less: Current Assets	4,00,000
Fixed Assets	17,00,000

(v) Composition of Current Assets

Inventory Turnover = 12

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

Closing Stock $= \frac{18,00,000}{12}$

Closing Stock = ₹ 1,50,000

Composition	₹
Stock	1,50,000
Receivables	2,00,000
Cash (Balancing Figure)	50,000
Total Current Assets	4,00,000

PROBLEM 9

Using the following information, PREPARE the balance sheet:

Long – term debt to net worth	0.5 to 1
Total asset turnover	2.5 x
Average collection period*	18 days
Inventory turnover	9 x
Gross profit margin	10%
Acid – test ratio	1 to 1

*Assume a 360 – days year and all sales on credit.

	₹		₹
Cash		Notes and payables	1,00,000
Accounts receivables		Long – term debt	
Inventory		Common Stock	1,00,000
Plant and equipment		Retained earnings	1,00,000
Total assets		Total liabilities and equity	

Solution:

$\frac{\text{Long – term debt}}{\text{Net worth}}$ = 0.5 = $\frac{\text{Long – term debt}}{2,00,000}$

Long – term debt = ₹ 1,00,000

Total liabilities and net worth = ₹ 4,00,000

Total Assets = ₹ 4,00,000

$\frac{\text{Sales}}{\text{Total assets}}$ = 2.5 = $\frac{\text{Sales}}{4,00,000}$ = Sales = ₹ 10,00,000

Cost goods sold = (0.9) (₹ 10,00,000) = ₹ 9,00,000

$\frac{\text{Cost of goods sold}}{\text{Inventory}}$ = $\frac{9,00,000}{\text{Inventory}}$ = 9 = Inventory = ₹ 1,00,000

$\frac{\text{Receivables x 360}}{10,00,000}$ = 18 days

Receivables = ₹ 50,000

$\frac{\text{Cash + 50,000}}{1,00,000}$ = 1

Cash = ₹ 50,000

Plan and equipment = ₹ 2,00,000.

Balance Sheet

	₹		₹
Cash	50,000	Notes and Payables	1,00,000
Accounts receivables	50,000	Long – term debt	1,00,000
Inventory	1,00,000	Common Stock	1,00,000
Plant and equipment	2,00,000	Retained earnings	1,00,000
Total assets	4,00,000	Total liabilities and equity	4,00,000

PROBLEM 10

Following information has been provided from the books of Laxmi Pvt. Ltd. for the year ending on 31st March, 2023:

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

You are required to PREPARE a summarized Balance Sheet as at 31st March, 2023 assuming that there is no long term debt.

Solution:

Working Notes:

(i) Current Assets and Current Liabilities computation:

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

Or Current assets = 2.5 Current Liabilities

Now, Working capital = Current assets – Current Liabilities

Or ₹ 4,80,000 = 2.5 Current liability – Current liability

Or 1.5 Current liability = ₹ 4,80,000

∴ Current Liabilities = ₹ 3,20,000

So, Current Assets = ₹ 3,20,000 x 2.5 = ₹ 8,00,000

(ii) Computation of stock

Liquid Ratio $= \frac{\text{Liquid assets}}{\text{Current Liabilities}}$

Or 1.5 $= \frac{\text{Current assets – Inventories}}{3,20,000}$

Or 1.5 x ₹ 3,20,000 = ₹ 8,00,000 – Inventories

Or Inventories = ₹ 8,00,000 - ₹ 4,80,000

Or Stock = ₹ 3,20,000

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

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

∴ Fixed Assets = 0.75 Proprietary fund (PF)

[FA + NWC – Long Term Debt = PF] i.e. FA + NWC = PF as there is no long – term debt.

Or NWC = PF – FA (i.e. 75 PF)]

Or Net Working Capital (NWC) = 0.25 Proprietary fund

Or ₹ 4,80,000 / 0.25 = Proprietary fund

Or Proprietary fund = ₹ 19,20,000

and Fixed Assets = 0.75 x proprietary fund
= 0,75 x ₹ 19,20,000 = ₹ 14,40,000

Capital = Proprietary fund – Reserves & Surplus
= ₹ 19,20,000 - ₹ 3,20,000 = ₹ 16,00,000

Sundry Creditors = (Current liabilities – Bank overdraft)
= (₹ 3,20,000 - ₹ 80,000) = ₹ 2,40,000

Balance Sheet as at 31st March, 2023

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

PROBLEM 11

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

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

You are required to CALCULATE:

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

Solution:

Working Notes:

i) Net Working Capital = Current Assets – Current Liabilities

= 2.5 – 1 = 1.5

$$= \frac{\text{Net Working Capital x 2.5}}{1.5}$$

$$= \frac{13,50,000 \text{ x } 25}{1.5} = ₹ 22,50,000$$

Current Liabilities = ₹ 22,50,000 - ₹ 13,50,000 = ₹ 9,00,000

ii) Sales = Total Assets Turnover x Total Assets 2 x (Fixed Assets x Current Assets)

= 2 x (₹ 30,00,000 + ₹ 22,50,000) = ₹ 1,05,00,000

iii) Cost of Goods Sold = 100% - 20% = 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 x 2) – Opening Stock

= (₹ 12,00,000 x 2) - ₹ 11,40,000 = ₹ 12,60,000

Quick Assets = Current Assets – Closing Stock

= ₹ 22,50,000 - ₹ 12,60,000 = ₹ 9,90,000

$\frac{\text{DEBT}}{\text{Equity (here Proprietary fund)}} = \frac{1}{1.5}$, Or Proprietary Fund = 1.5 Debt.

Debt + Equity = Fixed assets + Current assets – Current liabilities

Or 43,50,000 = 1.5 Debt + 1 Debt

Or Debt $= \frac{43,50,000}{2.5}$ = ₹ 17,40,000

Equity or proprietor's fund = 1.5 x 17,40,000 = 26,10,000

v) Profit after tax (PAT) = Total Assets x Return on Total Assets

= ₹ 52,50,000 x 15% = ₹ 7,87,500

(a) Calculation of Quick Ratio

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

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

Proprietary Ratio $= \frac{\text{Proprietary Fund}}{\text{Total Assets}} = \frac{26,10,000}{52,50,000}$ = 0.5 :1

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

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

$= \frac{7,87,500 - 54,000\ (9\%\ of\ 6,00,000)}{1,80,000}$

= ₹ 4.075 per share

PROBLEM 12

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

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

The goods are sold to customers at a margin of 50% on the direct cost

Tax Rate is 30%

You are required to calculate

(i) Net profit margin

(ii) Net operating profit margin

(iii) Return on assets

(iv) Return on owner's equity

Solution:

Debt = 10,00,000 x 50% = 500,000/-

Interest = 500,000 x 10% = 50,000/-

Direct cost = 50,000 x 10 = 500,000/-

Operating expenses = 100,000/-

∴ Sales = 150% of direct cost

= 150% (500,00)

= 7,50,000/-

Net profit before tax = 750,000 – 500,000 – 100,000 - 50,000

= 100,000

∴ PAT = 100,000 (1 - 0.3)

= 70,000/-

i) Net Profit margin $= \frac{70,000}{750,000}$ x 100 = 9.33%

ii) Net operating profit $= \frac{\text{EBIT } (1-t)}{\text{sales}}$ x 100

$= \frac{750,000-500,000-100,000)(1-0.3)}{750,000}$

$= \frac{105000}{750,000}$ = 14%

iii) ROA $= \frac{\text{Net Profit}}{\text{Total Assets}}$ x 100 $= \frac{105000}{10,00,000}$ x 100 = 10.5%

iv) ROE $= \frac{\text{PAT}}{\text{Equity}}$ x 100 $= \frac{70,000}{1000,000 \text{ x } 50\%}$ x 100 = 14%

PROBLEM 13

From the following information and ratios, PREPARE the Balance sheet as at 31st March 2023 and lncome statement for the year ended on that date for M/s Ganguly & Co –

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

Solution:

(i) Current Ratio = 3:1

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

CA = 3CL

WC = 10,00,000

CA – CL = 10,00,000

3CL – CL = 10,00,000

2CL = 10,00,000

CL = $\frac{10,00,000}{2}$

CL = ₹ 5,00,000

CA = 3 x 5,00,000

CA = ₹ 15,00,000

(ii) Acid Test Ratio = CA – Stock / CL = 1:1

= $\frac{15,00,000-\text{Stock}}{5,00,000} = 1$

15,00,000 – stock = 5,00,000

Stock = ₹ 10,00,000

(iii) Stock Turnover ratio (on sales) = 5

$\frac{\text{Sales}}{\text{Avg stock}}$ = 5

$\frac{\text{Sales}}{10,00,000}$ = 5

Sales = ₹ 50,00,000

(iv) Gross Profit = 50,00,000 x 40% = ₹ 20,00,000

Net profit (PBT) = 50,00,000 x 10% = ₹ 5,00,000

(v) PBIT/PBT = 2.2

PBIT = 2.2 x 5,00,000

PBIT = 11,00,000

Interest = 11,00,000 – 5,00,000 = ₹ 6,00,000

Long term loan = $\frac{6,00,000}{0.12}$ = ₹ 50,00,000

(vi) Average collection period = 30 days

Receivables = $\frac{\mathbf{30}}{\mathbf{360}}$ x 50.00.000 = 4,16,667

(vii) Fixed Assets Turnover Ratio = 0.8

50,00,000/ Fixed Assets = 0.8

Fixed Assets = ₹ 62,50,000

Income Statement

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

Balance sheet

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

PROBLEM 14

XYZ Company's details are: Revenue: ₹ 29,261; Net Income: ₹ 4,212; Assets: ₹ 27,987; Shareholders' Equity: ₹ 13,572. Calculate ROE using Du Pont Model.

Solution:

Here, Return on Equity as per Du Pont Model will be calculated as follows: Net Profit Margin = Net Income (₹ 4,212) ÷ Revenue (₹ 29,261)

= 0.14439 or 14.39%

Asset Turnover = Revenue (₹ 29,261) ÷ Assets (₹ 27,987) = 1.0455
Equity Multiplier = Assets (₹ 27,987) ÷ Shareholders' Equity (₹ 13,572) = 2.0621
Finally, we multiply the three components together to calculate the return on equity:
Return on Equity = Net Profit Margin x Asset Turnover x Equity Multiplier
= (0.1439) x (1.0455) x (2.0621) = 0.3102, or 31.02%

Analysis: A 31.02% return on equity is good in any industry. Yet, if you were to leave out the equity multiplier to see how much company would earn if it were completely debt-free, you will see that the ROE drops to 15.04% (0.1439 x 1.0455). 15.04% of the return on equity was due to profit margins and sales, while remaining 15.98% was due to returns earned on the debt at work in the business. If you could find a company at a comparable valuation with the same return on equity yet a higher percentage arose from internally generated sales, it would be more attractive.

CHAPTER 7 INVESTMENT DECISIONS

PROBLEM 1

Lockwood Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at he same cost of ₹ 5 lakhs each. Salvage value of the old machine is ₹ 1 lakh. The utilities of the existing machine can be used if the company purchases A. Additional cost of utilities to be purchased in that case are ₹ 1 lakh. If the company purchases B then all the existing utilities will have to be replaced with new utilities costing ₹ 2 lakhs. The salvage value of the old utilities will be ₹ 0.20 lakhs. The earnings after taxation are expected to be:

Year	(Cash – in – Flows of)		
	A ₹	B ₹	P.V. Factor @ 15%
1	1,00,000	2,00,000	0.870
2	1,50,000	2,10,000	0.756
3	1,80,000	1,80,000	0.658
4	2,00,000	1,70,000	0.572
5	1,70,000	40,000	0.497
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to (i) COMPUTE, for the two machines separately, net present value, discounted payback period and desirability factor and (ii) STATE which of the machines is to be selected?

Solution:

Working:

Calculation of Cash – outflow at year zero

Particulars	A (₹)	B (₹)
Cost of Machine	5,00,000	5,00,000
Cost of Utilities	1,00,000	2,00,000
Salvage value of Old Machine	(1,00,000)	(1,00,000)
Salvage or value Old Utilities	---	(20,000)
Total Expenditure (Net)	5,00,000	5,80,000

(i) (a) Calculation of NPV

Year	NPV Factor @ 15%	Machine A		Machine B	
		Cash inflows	Discounted value of inflows	Cash inflows	Discounted value of inflows
0	1.000	(5,00,000)	(5,00,000)	(5,80,000)	(5,80,000)
1	0.870	1,00,000	87,000	2,00,000	1,74,000
2	0.756	1,50,000	1,13,400	2,10,000	1,58,760
3	0.658	1,80,000	1,18,440	1,80,000	1,18,440
4	0.572	2,00,000	1,14,400	1,70,000	97,240
5	0.497	1,70,000	84,490	40,000	19,880
Salvage	0.497	50,000	24,850	60,000	29,820
			5,42,580		5,98,140
Net Present Value			42,580		18,140

Since the Net present Value of both the machines is positive both are acceptable.

(a) Discounted Pay – back Period (Amount in ₹)

Year	Machine A		Machine B	
	Discounted Cash Inflows	Cumulative Discounted Cash Inflows	Discounted Cash Inflows	Cumulative Discounted Cash Inflows
1	87,000	87,000	1,74,000	1,74,000
2	1,13,400	2,00,400	1,58,760	3,32,760
3	1,18,440	3,18,840	1,18,440	4,51,200
4	1,14,400	4,33,240	97,240	5,48,440
5	1,09,340*	5,42,580	49,700*	5,98,140

* Includes salvage value

Discounted Payback Period (For A and B):

Machine A = 4 years + $\frac{5,00,000 - 4,33,240}{1,09,340}$ = 4 - 61 years

Machine B = 4 years + $\frac{5,80,000 - 5,48,440}{49,700}$ = 4 - 63 years

(b) Desirability Factor or Profitability Index:

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

Machine A = $\frac{5,42,580}{5,00,000}$ = 1.08; Machine B = $\frac{5,98,140}{5,80,000}$ = 1.03

(ii) Since the absolute surplus in the case of A is more than B and also the desirability factor, it is better to choose A.

The discounted payback period in both the cases is almost same, also the net present value is positive in both the cases but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A.

PROBLEM 2

Hind lever Company is considering a new product line to supplement its range of products. It is anticipated that the new product line will involve cash investments of ₹ 7,00,000 at time 0 and ₹ 10,00,000 in year 1. After – tax cash inflows of ₹ 2,50,000 are expected in year 2, ₹ 3,00,000 in year 3, ₹ 3,50,000 in year 4 and ₹ 4,00,000 each year thereafter through year 10. Although the product line might be viable after year 10, the company prefers to be conservative and end all calculations at that time.

(a) If the required rate of return is 15 per cent, COMPUTE net present value of the project? Is it acceptable?

(b) ANALYSE What would be the case if the required rate of return were 10 per cent?

(c) CALCULATE its internal rate of return?

(d) COMPUTE the project's payback period?

Solution:

(a) Computation of NPV at 15% discount rate

Year	Cash Flow	Discount Factor (15%)	Present Value
	(₹)		(₹)
0	(7,00,000)	1.000	(7,00,000)
1	(10,00,000)	0.870	(8,70,000)
2	2,50,000	0.756	1,89,000
3	3,00,000	0.658	1,97,400
4	3,50,000	0.572	2,00,200
5 – 10	4,00,000	2.163	8,65,200
		Net Present Value	(1,18,200)

As the net present value is negative, the project is unacceptable.

(b) Compute of NPV if discount rate would be 10% discount rate

Year	Cash Flow	Discount Factor (10%)	Present Value
	(₹)		(₹)
0	(7,00,000)	1.000	(7,00,000)
1	10,00,000	0.909	(9,09,000)
2	2,50,000	0.826	2,06,500
3	3,00,000	0.751	2,25,300
4	3,50,000	0.683	2,39,050
5 – 10	4,00,000	2.974	11,89,600
		Net Present Value	2,51,450

Since NPV = ₹ 2,51,450 is positive, hence the project would be acceptable.

(c) Calculation of IRR:

$$\text{IRR} = \text{LR} + \frac{\text{NPV at LR}}{\text{NPV at LR} - \text{NPV at HR}} \text{ x (HR –LR)}$$

$$= 10\% + \frac{2,51,450}{2,51,450 - (-)\ 1,18,200} \text{ x (15\% - 10\%)}$$

$$= 10\% + 3.4012 = 13.40\%$$

(d) Computation of Pay – back period of the project:
Payback Period = 6 years:
- ₹ 7,00,000 - ₹ 10,00,000 + ₹ 2,50,000 + ₹ 3,00,000 + ₹ 3,50,000 + ₹ 4,00,000 + ₹ 4,00,000 = 0

PROBLEM 3

Elite Cooker Company is evaluating three investment situations: (1) produce a new line of aluminum skillets, (2) expand its existing cooker line to include several new sizes, and (3) develop a new, higher quality line of cookers. If only the project in question is undertaken, the expected present values and the amounts of investment required are:

Project	Investment required	Present value of Future Cash – Flows
	₹	₹
1	2,00,000	2,90,000
2	1,15,000	1,85,000
3	2,70,000	4,00,000

If projects 1 and 2 are jointly undertaken, there will be no economies; the investments required and present values will simply be the sum of the parts. With projects 1 and 3, economies are possible in investment because one of the machines acquired can be used in both production processes. The total investment required for projects 1 and 3 combined is ₹ 4,40,000. If projects 2 and 3 are undertaken, there are economies to be achieved in marketing and producing the products but not in investment. The expected present value of future cash flows for projects 2 and 3 is ₹ 6,20,000. If all three projects are undertaken simultaneously, the economies noted will still hold. However, a ₹ 1,25,000 extension on the plant will be necessary, as space is not available for all three projects. CALCULATE NPV of the projects and STATE which project of projects should be chosen?

Solution:

Project	Investment Required	Present value of Future Cash Flows	Net Present Value
	₹	₹	₹
1	2,00,000	2,90,000	90,000
2	1,15,000	1,85,000	70,000
3	2,70,000	4,00,000	1,30,000
1 and 2	3,15,000	4,75,000	1,60,000
1 and 3	4,40,000	6,90,000	2,50,000
2 and 3	3,85,000	6,20,000	2,35,000
1, 2 and 3 (Refer Working note)	6,80,000*	9,10,000	2,30,000

Working Note:

(i) Total investment required if all the three projects are undertaken simultaneously.

	(₹)
Project 1 & 3	4,40,000
Project 2	1,15,000
Plant Extension Cost	1,25,000
Total	6,80,000

(ii) Total of Present value of Cash flows if all the three projects are undertaken simultaneously.

	(₹)
Project 2 & 3	6,20,000
Project 1	2,90,000
Total	9,10,000

Project 1 and 3 should be chosen, as they provide the highest net present value.

PROBLEM 4

Cello Limited is considering buying a new machine which would have a useful economic life of five years, a cost of ₹ 1,25,000 and a scrap value of ₹ 30,000, with 80 per cent of the cost being payable at the start of the project and 20 per cent at the end of the first year. The machine would produce 50,000 units per annum of a new product with an estimated selling price of ₹ 3 per unit. Direct costs would be ₹ 1.75 per unit and annual fixed costs, including depreciation calculated on a straight – line basis, would be ₹ 40,000 per annum.

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to ₹ 10,000 and ₹ 15,000 respectively.

CALCULATE NPV of the project for investment appraisal, assuming the company's cost of capital is 10 percent.

Solution:

Calculation of Net Cash Flows

Contribution = (3.00 – 1.75) x 50,000 = ₹ 62,500

Fixed Costs = 40,000 – [(1,25,000 – 30,000)/5] = ₹ 21,000

Year	Capital (₹)	Contribution (₹)	Fixed Costs (₹)	Adverts (₹)	Net Cash Flow (₹)
0	(1,00,000)				(1,00,000)
1	(25,000)	62,500	(21,000)	(10,000)	6,500
2		62,500	(21,000)	(15,000)	26,500
3		62,500	(21,000)		41,500
4	30,000	62,500	(21,000)		41,500
5		62,500	(21,000)		71,500

Calculation of Net Present Value

Year	Net Cash Flow (₹)	10%discount factor	Present value (₹)
0	(1,00,000)	1.000	(1,00,000)
1	6,500	0.909	5,909
2	26,500	0.826	21,889
3	41,500	0.751	31,167
4	41,500	0.683	28,345
5	71,500	0.621	44,402
NPV			31,712

The net present value of the project is ₹ 31,712.

PROBLEM 5

Ae Bee Cee Ltd. is planning to invest in machinery, for which it has to make a choice between the two identical machines, in terms of Capacity, 'X' and 'Y'. Despite being designed differently, both machines do the same job. Further, details regarding both the machines are given below:

Particulars	Machine 'X'	Machine 'Y'
Purchase Cost of the Machine (₹)	15,00,000	10,00,000
Life (years)	3	2
Running cost per year (₹)	4,00,000	6,00,000

The opportunity cost of capital is 9%.

You are required to:

IDENTIFY the machine the company should buy?

The present value (PV) factors at 9% are:

Year	t1	t2	t3
PVIF0.09.t	0.917	0.842	0.772

Solution:

Statement Showing the Evaluation of Two Machines

Particulars	Machine 'X'	Machine 'Y'
(i) Purchase Cost	₹ 15,00,000	₹ 10,00,000
(ii) Life of Machine	3 years	2 years
(iii) Running Cost of Machine per year	₹ 4,00,000	₹ 6,00,000
(iv) PVIFA 0.09, 3	2.531	
PVIFA 0.09, 2		1.759
(v) PV of Running Cost of Machine {(iii) x (iv)}	₹ 10,12,400	₹ 10,55,400
(vi) Cash outflows of Machine {(i) + (v)}	₹ 25,12,400	₹ 20,55,400
(vii) Equivalent PV of Annual Cash outflow (vi/iv)	₹ 9,92,651	₹ 11,68,505

Recommendation: Ae Bee Cee Ltd. should buy Machine 'X' since equivalent annual cash outflow is less than that of Machine 'Y'.

PROBLEM 6

Alley Pvt. Ltd. is planning to invest in a machinery that would cost ₹ 1,00,000 at the beginning of year 1. Net cash inflows from operations have been estimated at ₹ 36,000 per annum for 3 years. The company has two options for smooth functioning of the machinery – one is service, and another is replacement of parts. If the company opts to service a part of the machinery at the end of year 1 at ₹ 20,000, in such a case, the scrap value at the end of year 3 will be ₹ 25,000. However, if the company decides not to service the part, then it will have to be replaced at the end of year 2 at ₹ 30,800. And in this case, the machinery will work for the 4th year also and get operational cash inflow of ₹36,000 for the 4th year. It will have to be scrapped at the end of year 4 at ₹ 18,000.

Assuming cost of capital at 10% and ignoring taxes, DETERMINE the purchase of this machinery based on the net present value of its cash flows?
If the supplier gives a discount of ₹ 10,000 for purchase, what would be your decision? Note:

The PV factors at 10% are:

Year	0	1	2	3	4	5	6
PV Factor	1	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645

Solution:

Option I : Purchase Machinery and Service Part at the end of Year 1.

Net Present value of cash flow @ 10% per annum discount rate.

NPV (in ₹) = - 1,00,000 + $\frac{36,000}{(1.1)}$ + $\frac{36,000}{(1.1)^2}$ + $\frac{36,000}{(1.1)^3}$ – $\frac{20,000}{(1.1)}$ + $\frac{25,000}{(1.1)^3}$ = - 9874.7

If the Supplier gives a discount of ₹ 10,000, then

NPV (in ₹) = 10,000 – 9874.7 = + 125.3

Option II : Purchase Machinery and replace Part at the end of Year 2.

NPV (in ₹) = - 1,00,000 + $\frac{36,000}{(1.1)}$ + $\frac{36,000}{(1.1)^2}$ + $\frac{36,000}{(1.1)^3}$ – $\frac{30,800}{(1.1)^2}$ + $\frac{54,000}{(1.1)^4}$ = 953.68

If the Supplier gives a discount of ₹ 10,000, then

NPV (in ₹) = 10,000 + 953.68 = + 10958.68

Decision: Option II is worth investing as the net present value is positive and higher as compared to Option I.

PROBLEM 7

NavJeevani hospital is considering to purchase a machine for medical projectional radiography which is priced at ₹ 2,00,000. The projected life of the machine is 8 years and has an expected salvage value of ₹ 18,000 at the end of 8th year. The annual operating cost of the machine is ₹ 22,500. It is expected to generate revenues of ₹ 1,20,000 per year for eight years. Presently, the hospital is outsourcing the radiography work to its neighbour Test Center and is earning commission income of ₹ 36,000 per annum, net of taxes.
Required:

ANALYSE whether it would be profitable for the hospital to purchase the machine? Give your recommendation under:

(i) Net Present Value method

(ii) Profitability Index method.

Consider tax @ 30%. PV factors at 10% are given below:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

Solution:

Determination of Cash inflows	₹
Sales Revenue Less:	1,20,000
Operating Cost	22,500
	97,500
Less: Depreciation (₹ 2,00,000 - ₹ 18,000)/8	22,750
Net Income	74,750
Tax @ 30%	22,425
Earnings after Tax (EAT)	52,325
Add: Depreciation	22,750
Cash inflow after tax per annum	75,075
Less: Loss of Commission Income	36,000
Net Cash inflow after tax per annum In 8th Year:	39,075
New Cash inflow after tax	39,075
Add: Salvage Value of Machine	18,000
Net Cash inflow in year 8	57,075

(i) Calculation of Net Present Value (NPV)

Year	CFAT (₹)	PV Factor @ 10%	Present Value of Cash inflows (₹)
1 to 7	39,075	4.867	1,90,178.03
8	57,075	0.467	26,654.03
			2,16,832.06
Less: Cash Outflows NPV			2,00,000.00
			16,832.06

(ii) Profitability Index = $\frac{\text{Sum of discounted cash in flows}}{\text{Present value of cash out flows}} = \frac{2,16,832.06}{2,00,000} = 1.084$

Advise: Since the net present value (NPV) is positive and profitability index is also greater than 1, the hospital may purchase the machine.

PROBLEM 8

XYZ Ltd. is planning to introduce a new product with a project life of 8 years. Initial equipment cost will be ₹ 3.5 crores. Additional equipment costing ₹ 25,00,000 will be purchased at the end of the third year from the cash inflow of this year. At the end of 8 years, the original equipment will have not resale value, but additional equipment can be sold for ₹ 2,50,000. A working capital of ₹ 40,00,000 will be needed and it will be released at the end of eighth year. The project will be financed with sufficient amount of equity capital.

The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4 – 5	6 – 8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

A sales price of ₹ 240 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount ₹ 36,00,000 per year. The loss of any year will be set off from the profits of subsequent two years. The company is subject to 30 per cent tax rate and considers 12 per cent to be an appropriate after tax cost of capital for this project. The company follows straight line method of depreciation.

Required:

CALCULATE the net present value of the project and advise the management to take appropriate decision.

Note:

The PV factors at 12% are

Year	1	2	3	4	5	6	7	8
PV Factor	0.893	0.797	0.712	0.636	0.567	0.507	0.452	0.404

Solution:

Workings:

(a) Calculation of annual cash flows (₹ in lakh)

Year	Sales	VC	FC	Dep.	Profit	Tax	PAT	Dep.	Cash inflow
1	172.80	103.68	36	43.75	(10.63)	---	---	43.75	33.12
2	259.20	155.52	36	43.75	23.93	3.99*	19.94	43.75	63.69
3	624.00	374.40	36	43.75	169.85	50.955	118.895	43.75	162.645
4 – 5	648.00	388.80	36	48.25	174.95	52.485	122.465	48.75	170.715
6 – 8	432.00	259.20	36	48.25	88.55	26.565	61.985	48.25	110.235

(b) Calculation of Depreciation:

- On Initial equipment = $\frac{350 \text{ lakh}}{8 \text{ years}}$ = 43.75 lakh

- On additional equipment = $\frac{(25 - 2.5) \text{ lakh}}{5 \text{ years}}$ = 4.5 lakh

(c) *Calculation of tax in 2nd Year:

	₹ in lakh
Profit for the year	23.93
Less: Set off of unabsorbed depreciation in 1st year	(10.63)
Taxable profit	13.30
Tax @ 30%	3.99

(d) Calculation of initial cash outflow

	₹ in lakh
Cost of New Equipment	350
Add: Working Capital	40
Outflow	390

Calculation of NPV (₹ in lakh)

Year	Cash Flows	PV factor @ 12%	PV of Cash – Flows	Remark
0	(390)	1.000	(390.00)	Initial equipment cost
1	33.12	0.893	29.57	
2	63.69	0.797	50.76	
3	162.645	0.712	115.80	
3	(25.00)	0.712	(17.80)	Additional equipment cost
4	170.715	0.636	108.57	
5	170.715	0.567	96.79	
6	110.235	0.507	55.89	
7	110.235	0.452	49.83	
8	110.235	0.404	44.53	
8	40.00 + 2.5	0.404	17.17	Release of working capital
Net Present Value			161.11	

Advise: Since the project has a positive NPV, therefore, it should be accepted.

PROBLEM 9

A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present, the waste is removed by a contractor for disposal on payment by the company of ₹ 150 lakh per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of a compensation of ₹ 90 lakh before the processing operation starts. This compensation is not allowed as deduction for tax purposes.

The machine required for carrying out the processing will cost ₹ 600 lakh to be finance by a loan repayable in 4 equal installments commencing from end of the year – 1. The interest rate is 14% per annum. At the end of the 4th year, the machine can be sold for ₹ 60 lakh and the cost of dismantling and removal will be ₹ 45 lakh.

Sales and direct costs of the product emerging from waste processing for 4 years are estimated as under:

(₹ in lakh)

Year	**1**	**2**	**3**	**4**
Sales	966	966	1,254	1,254
Material Consumption	90	120	255	255
Wages	225	225	255	300
Other expenses	120	135	162	210
Factory overheads	165	180	330	435
Depreciation (as per income tax rules)	150	114	84	63

Initial stock of materials required before commencement of the processing operations is ₹ 60 lakh at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be ₹ 165 lakh and the stocks at the end of year 4 will be nil. The storage o materials will utilize space which would otherwise have been rented out for ₹ 30 lakh per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of ₹ 45 lakh in the year – 1 and ₹ 30 lakh in the year – 2. Factory overheads includes apportionment of general factory overheads except to the extent of insurance charges of ₹ 90 lakh per annum payable on this venture. The company's tax rate is 30%.
Present value factors for four years are as under:

Year	1	2	3	4
PV factors @ 14%	0.877	0.769	0.674	0.592

ADVISE the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

Solution:

Statement of Operating Profit from processing of waste

(₹ in lakh)

Year	1	2	3	4
Sales : (A)	966	966	1,254	1,254
Material Consumption	90	120	255	255
Wages	180	195	255	300
Other expenses	120	135	162	210
Factory overheads (insurance only)	90	90	90	90
Loss of rent on storage space (opportunity cost)	30	30	30	30
Interest @ 14%	84	63	42	21
Depreciation (as per income tax rules)	150	114	84	63
Total cost: (B)	744	747	918	969
Profit (C) = (A) – (B)	222	219	336	285
Tax (30%)	66.6	65.7	100.8	85.5
Profit after Tax (PAT)	155.4	153.3	235.2	199.5

Statement of Incremental Cash Flows

(₹ in lakh)

Year	0	1	2	3	4
Material Stock	(60)	(105)	---	---	165
Compensation for contract	(90)	---	---	---	---
Contract payment saved	---	150	150	150	150
Tax on contract payment	---	(45)	(45)	(45)	(45)
Incremental profit	---	222	219	336	285
Depreciation added back	---	150	114	84	63
Tax on profits	---	(66.6)	(65.7)	(100.8)	(85.5)
Loan repayment	---	(150)	(150)	(150)	(150)
Profit on sale of machine (net)	---	---	---	---	15
Total incremental cash flows	(150)	155.4	222.3	274.2	397.5
Present value factor	1.00	0.877	0.769	0.674	0.592
Present value of cash flows	(150)	136.28	170.95	184.81	235.32
Net present value					577.36

Advice: Since the net present value of cash flows is ₹ 577.36 lakh which is positive the management should install the machine for processing the waste.

Notes:

1. Material stock increases are taken in cash flows.
2. Idle time wages have also been considered
3. Apportioned factory overheads are not relevant only insurance charges of this project are relevant.
4. Interest calculated at 14% based on 4 equal installments of loan repayment.
5. Sale of machinery – Net income after deducting removal expenses taken. Tax on Capital gains ignored.
6. Saving in contract payment and income tax thereon considered in the cash flows.

PROBLEM 10

A firm is in a need of a small vehicle to make deliveries. It is intending to choose between two options. One option is to buy a new three wheeler that would cost ₹ 1,50,000 and will remain in service for 10 years.

The other alternative is to buy a second hand vehicle for ₹ 80,000 that could remain in service for 5 years. Thereafter the firm, can buy another second hand vehicle for ₹ 60,000 that will last for another 5 years.

The scrap value of the discarded vehicle will be equal to it written down value (WDV). The firm pays 30% tax and is allowed to claim depreciation on vehicles @ 25% on WDV basis.
The cost of capital of the firm is 12%.

Your required to advise the best option.

Given:

t	1	2	3	4	5	6	7	8	9	10
PVIF (t, 12%)	0.892	0.797	0.711	0.635	0.567	0.506	0.452	0.403	0.360	0.322

Solution:

Option I

Cal^{n} of Depreciation taxshield & Statement of NPV

Year	**Op. WDV**	**Depr @ 25%**	**Depr taxshield @ 30%**	**CF**	**DF @ 12%**	**DCF**
0				(150,000)	1	(150,000)
1	150,000	37,500	11,250	11,250	0.892	10,035
2	1,12,500	28,125	8,438	8,438	0.797	6,725
3	84,375	21,094	6,328	6,328	0.711	4,499
4	63,281	15,820	4,746	4,746	0.635	3,014
5	47,461	11,865	3,560	3,560	0.567	2,019
6	35,596	8,899	2,670	2,670	0.506	1,351
7	26,697	6,674	2002	2,002	0.452	905
8	20,023	5,006	1502	1,502	0.403	605
9	15,017	3,754	1,126	1,126	0.360	405
10	11,263	2,816	845	845	0.322	272
10				8447 [11,263 - 2,816]	0.322	2,720
					NPV	(1,17,450)

Option II

Cal^{n} of Depreciation taxshield & Statement of NPV

Year	Op. WDV	Depr @ 25%	Taxshield @ 30%	CF	DF @ 12%	DCF
0				(80,000)	1	(80,000)
1	80,000	20,000	6,000	6,000	0.892	5,352
2	60,000	15,000	4,500	4,500	0.797	3,587
3	45,000	11,250	3,375	3,375	0.711	2,400
4	33,750	8,438	2,531	2,531	0.635	1,607
5	25,312	6,328	1,898	1,898	0.567	1,076
5				18,984	0.567	10,764
5				(60,000)	0.567	(34,020)
6	60,000	15,000	4,500	4,500	0.506	2,277
7	45,000	11,250	3,375	3,375	0.452	1,526
8	33,750	8,438	2,531	2,531	0.403	1,020
9	25,312	6,328	1,898	1,898	0.360	683
10	18,984	4,746	1424	1,424	0.322	459
10				14,238	0.322	4585
					NPV	(78,684)

Option II is best
Assumption: Revenue & Operating expenses are same for both options.

PROBLEM 11

A hospital is considering to purchase a diagnostic machine costing ₹ 80,000. The projected life of the machine is 8 years and has an expected salvage value of ₹ 6,000 at the end of 8 years. The annual operating cost of the machine is ₹ 7,500. It is expected to generate revenues of ₹ 40,000 per year for eight years. Presently, the hospital is outsourcing the diagnostic work and is earning commission income of ₹ 12,000 per annum.

Consider tax rate of 30% and Discounting Rate as 10%.

Advise:

Whether it would be profitable for the hospital to purchase the machine?
Give your recommendation as per Net Present Value method and Present Value Index method under below mentioned two situations:

(i) If Commission income of ₹ 12,000 p.a. is before taxes.
(ii) If Commission income of ₹ 12,000 p.a. is net of taxes.

T	1	2	3	4	5	6	7	8
PVIF (t, 10%)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

Solution:

i) Determination of CF: If commission is before taxes

Sr. No.	Particulars	₹
A	Sales revenue	40,000
B	Operating cost	7,500
C	Loss of commission	12000
C	Depreciation (80,000 – 6000)/8	9,250
D	Net income (A -B- C- D)	11,250
E	Tax @ 30% on D	3,375
F	PAT (D - E)	7,875
G	Depreciation (Non Cash)	9,250
H	Net CFAT (F + G)	17,125

Statement of NPV:

Year	Particulars	CF	DF @ 10%	DCF
0	Initial CF	(80,000)	1	(80,000)
1-8	Net CFAT	17,125	5.334	91,345
8	Terminal CF	6,000	0.467	2,802
			NPV	14,147

∴ PI = $\frac{14147 + 80,000}{80,000}$ = 1.1768 times

ii) Determination of CF: If commission is net of taxes

Sr. No.	Particulars	₹
A	Sales revenue	40,000
B	Operating cost	7,500
		32,500
C	Depreciation (80,000 – 6000)/8	9,250
D	Net income (A -B- C)	23,250
E	Tax @ 30% on D	6,975
F	CFAT (A – B – E)	25,525
G	Loss of commission after tax	12,000
H	Net CFAT (F – G)	13,525

Statement of NPV:

Year	Particulars	CF	DF @ 10%	DCF
0	Initial CF	(80,000)	1	(80,000)
1-8	Net CFAT	13,525	5.334	72,142
8	Terminal CF	6,000	0.467	2,802
			NPV	5,056

∴ PI = $\frac{-5,5056+80,000}{80,000}$ = 0.9368 times

PROBLEM 12

K. K. M. M Hospital is considering purchasing an MRI machine. Presently, the hospital is outsourcing the work received relating to MRI machine and is earning commission of ₹ 6,60,000 per annum (net of tax). The following details are given regarding the machine:

	(₹)
Cost of MRI machine	90,00,000
Operating cost per annum (excluding Depreciation)	14,00,000
Expected revenue per annum	45,00,000
Salvage value of the machine (after 5 years)	10,00,000
Expected life of the machine	5 years

Assuming tax rate @ 40%, whether it would be profitable for the hospital to purchase the machine? Give your RECOMMENDATION under:

(i) Net Present Value Method, and
(ii) Profitability Index Method.

PV factors at 10% are given below:

Year	1	2	3	4	5
PV factor	0.909	0.826	0.751	0.683	0.620

Solution:

Determination of Cash inflows

Elements	**(₹)**
Sales Revenue	45,00,000
Less: Operating Cost	14,00,000
	31,00,000
Less: Depreciation (90,00,000 – 10,00,000)/5	16,00,000
Net Income	15,00,000
Tax @ 40%	6,00,000
Earnings after Tax (EAT)	9,00,000
Add: Depreciation	16,00,000
Cash inflow after tax per annum	25,00,000
Less: Loss of Commission Income	6,60,000
Net Cash inflow after tax per annum	18,40,000
In 5th Year:	
New Cash inflow after tax	18,40,000
Add: Salvage Value of Machine	10,00,000
Net Cash inflow in year 5	28,40,000

Calculation of Net Present Value (NPV)

Year	CFAT	PV Factor @10%	Present Value of Cash inflows
1 to 4	18,40,000	3.169	58,30,960
5	28,40,000	0.620	17,60,800
			75,91,760
Less: Cash Outflows			90,00,000
NPV			(14,08,240)

Profitability index = $\frac{\text{Sum of discounted cash in flows}}{\text{present value of cash outflow}} = \frac{75,91,760}{90,00,000} = 0.844$

Advise: Since the net present value is negative and profitability index is also less than 1, therefore, the hospital should not purchase the MRI machine.

PROBLEM 13

HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of ₹ 2,40,000 on 31st March . The machine has begun causing problems with breakdowns and it cannot fetch more than ₹ 30,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered ₹ 1,00,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of ₹ 4,50,000. The expected life of new machine is 10 years with salvage value of ₹ 35,000.

Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 7.5% is considering that this is the only machine in the block of assets.
Given below are the expected sales and costs from both old and new machine:

	Old machine (₹)	New machine (₹)
Sales	8,10,000	8,10,000
Material cost	1,80,000	1,26,250
Labour cost	1,35,000	1,10,000
Variable overhead	56,250	47,500
Fixed overhead	90,000	97,500
Depreciation	24,000	41,500
PBT	3,24,750	3,87,250
Tax @ 30%	97,425	1,16,175
PAT	2,27,325	2,71,075

From the above information, ANALYSE whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.
PV factors @ 10%:

Year	1	2	3	4	5	6	7	8	9	10
PVF	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386

Solution:

Workings:

1. Calculation of Base for depreciation or Cost of New Machine

Particulars	(₹)
Purchase price of new machine	4,50,000
Less: Sale price of old machine	1,00,000
	3,50,000

2. Calculation of Profit before tax as per books

Particulars	Old machine (₹)	New machine (₹)	Difference (₹)
PBT as per books	3,24,750	3,87,250	62,500
Add: Depreciation as per books	24,000	41,500	17,500
Profit before tax and depreciation (PBTD)	3,48,750	4,28,750	80,000

Calculation of Incremental NPV

Year	PVF @ 10%	PBTD (₹)	Dep. @ 7.5% (₹)	PBT (₹)	Tax @ 30% (₹)	Cash Inflows (₹)	PV of Cash Inflows (₹)
	(1)	(2)	(3)	(4)	(5) = (4) x 0.30	(6) = (4) – (5) + (3)	(7) = (6) x (1)
1	0.909	80,000.00	26,250.00	53,750.00	16,125.00	63,875.00	58,062.38
2	0.826	80,000.00	24,281.25	55,718.75	16,715.63	63,284.38	52,272.89
3	0.751	80,000.00	22,460.16	57,539.84	17,261.95	62,738.05	47,116.27
4	0.683	80,000.00	20,775.64	59,224.36	17,767.31	62,232.69	42,504.93
5	0.621	80,000.00	19,217.47	60,782.53	18,234.76	61,765.24	38,356.21
6	0.564	80,000.00	17,776.16	62,223.84	18,667.15	61,332.85	34,591.73
7	0.513	80,000.00	16,442.95	63,557.05	19,067.12	60,932.88	31,258.57
8	0.467	80,000.00	15,209.73	64,790.27	19,437.08	60,562.92	28,282.88
9	0.424	80,000.00	14,069.00	65,931.00	19,779.30	60,220.70	25,533.58
10	0.386	80,000.00	13,013.82	66,986.18	20,095.85	59,904.15	23,123.00
							3,81,102.44
Add: PV of Salvage value of new machine (₹ 35,000 x 0.386)							13,510.00
Total PV of incremental cash inflows							3,94,612.44
Less: Cost of new machine							3,50,000.00
Incremental Net Present Value							44,612.44

Analysis: Since the Incremental NPV is positive, the old machine should be replaced.

PROBLEM 13

XYZ Ltd. is presently all equity financed. The directors of the company have been evaluating investment in a project which will require ₹ 270 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of ₹ 42 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applies to such investment decisions is 14% net.

The directors of the company believe that the current capital structure fails to take advantage of tax benefits of debt and propose to finance the new project with undated perpetual debt secured on the company's assets. The company intends to issue sufficient debt to cover the cost of capital expenditure and the after tax cost of issue.

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 10%. The after tax costs of issue are expected to be ₹ 10 lakhs. Company's tax rate is 30%.

You are REQUIRED to:

(i) Calculate the adjusted present value of the investment,

(ii) Calculate the adjusted discount rate and

(iii) Explain the circumstances under which this adjusted discount rate may be used to evaluate future investments.

Solution:

(i) Calculation of Adjusted Present Value of Investment (APV)

Adjusted PV = Base Case PV + PV of financing decisions associated with the project

Base Case NPV for the project:

(-) ₹ 270 lakhs + (₹ 42 lakhs / 0.14)	= (-) ₹ 270 lakhs + ₹ 300 lakhs
	= ₹ 30
Issue costs	= ₹ 10 lakhs
Thus, the amount to be raised	= ₹ 270 lakhs + ₹ 10 lakhs
	= ₹ 280 lakhs
Annual tax relief on interest payment	= ₹ 280 x 0.1 x 0.3
	= ₹ 8.4 lakhs in perpetuity
The value of tax relief in perpetuity	= ₹ 8.4 lakhs / 0.1
	= ₹ 84 lakhs

Therefore, APV = Base case PV – Issue Costs + PV of Tax Relief on debt interest

= ₹ 30 lakhs – ₹ 10 lakhs + 84 lakhs = ₹ 104 lakhs

(ii) Calculation of Adjusted Discount Rate (ADR)

Annual Income / Savings required to allow an NPV to zero

Let the annual income be x.

(-) ₹ 280 lakhs + (Annual Income / 0.14)	= (-) ₹ 104 lakhs
Annual Income / 0.14	= (-) ₹ 104 + ₹ 280 lakhs
Therefore, Annual income	= ₹ 176 x 0.14 = ₹ 24.64 lakhs
Adjusted discount rate	= (₹ 24.64 lakhs / ₹ 280 lakhs) x 100
	= 8.8%

(iii) Useable circumstances

This ADR may be used to evaluate future investments only if the business risk of the new venture is identical to the one being evaluated here and the project is to be financed by the same method on the same terms. The effect on the company's cost of capital of introducing debt into the capital structure cannot be ignored.

PROBLEM 14

A and B are two mutually exclusive investments involving different outlays. The details are:

Particulars	Project A	Project B
Initial Investment (₹)	50,00,000	75,00,000
Net Cash Inflow (₹)	62,50,000	91,50,000
IRR (%)	25	22
NPV (₹)	6,81,250	8,17,350

Cost of capital (k) = 10%. Which method will be accepted? (Assume life 1 year)

Solution:

Particulars	Project (B-A) (₹)
Differential Cash outflows	25,00,000
Differential Cash inflows	29,00,000

We know that IRR is the discount rate at which Present Value of Cash Inflows are equal to the Present Value of Cash Outflows.
So, 25,00,000 = 29,00,000 / (1+ r)1
Or, 1 + r = 29,00,000 / 25,00,000
Or, r = 1.16 – 1 = 0.16 = 16%

The two methods i.e., NPV and IRR rank the projects differently.
Project A has a higher IRR (0.25) than project B (0.22) but the NPV of project B (₹ 8,17,350) is more than that of A (₹ 6,81,250).

The important question is which method, in such a situation, gives better results?

The answer should be related to the effect of the decision on the maximization of the shareholders' wealth. The IRR method is not compatible with the goal of wealth maximization as it is concerned with the rate of return on investment or yield rather than the total yield on the investment.

Here, 10% to be the required rate of return, the firm would be left with ₹ 7,50,000 [₹ 62,50,000 – (₹ 50,00,000 + 0.10 x ₹ 50,00,000)] after one year in case project A is accepted and ₹ 9,00,000 [₹ 91,50,000 – (₹ 75,00,000) + 0.10 x ₹ 75,00,000] in case of Project B is accepted.

The NPV method suggests that project B is better. This recommendation is consistent with the goal of the firm of maximising shareholders' wealth.

As IRR (r) of the differential cash flows = 16%, which is greater than Cost of Capital (k). Therefore, Project with higher non-discounted cash inflows, i.e., Project B would be selected.

PROBLEM 15

The following information is obtained from the two projects:

Particulars	P (₹)	Q (₹)
Initial Investment	10,00,000	20,00,000
Cash Inflows		
Year 1	8,00,000	8,00,000
Year 2	7,00,000	9,00,000

Year 3	Nil	7,00,000
Year	Nil	6,00,000
Service Life	2 Years	4 Years
Required rate of return: 10%		

Which project should be preferred?

Solution:

Project A

Year	Cash flows (₹)	PV factor	Present Value (₹)
0	(10,00,000)	1.000	(10,00,000)
1	8,00,000	0.909	7,27,200
2	7,00,000	0.826	5,78,200
3	(10,00,000)**	0.826	(8,26,000)
3	8,00,000	0.751	6,00,800
4	7,00,000	0.683	4,78,100
NPV			5,58,300

** Machine replaced at the end of year two.

Project B

Year	Cash flows (₹)	PV factor	Present Value (₹)
0	(20,00,000)	1.000	(10,00,000)
1	8,00,000	0.909	7,27,200
2	9,00,000	0.826	7,43,400
3	7,00,000	0.751	5,25,700
4	6,00,000	0.683	4,09,800
NPV			4,06,100

Decision: Project A should be preferred to project B because of its higher NPV. If we compare the two projects without incorporating the consequences of replacing the machine at the end of year 2, the decision would have been the reverse, because the net present value of project A then would be ₹ 3,05,400 [₹ 7,27,200 + ₹ 5,78,200 – ₹ 10,00,000].

PROBLEM 16

X Ltd. has a capital budget of ₹ 1.5 crore for the year. From the following information relating to six independent proposals, select the projects if (i) the projects are divisible and (ii) the projects are indivisible.

Proposal	Investments (₹)	NPV (₹)
A	70,00,000	30,00,000
B	25,00,000	16,00,000
C	50,00,000	20,00,000
D	20,00,000	10,00,000
E	55,00,000	45,00,000
F	75,00,000	-25,00,000

Solution:

If the projects are divisible

Projects are ranked according to PI and arranged in descending order.

Proposal Rank NPV (₹)	Investments (₹)	PV of Inflows (NPV+I)	PI	Rank	NPV (₹)
A	70,00,000	1,00,00,000	100/70 = 1.43	(4)	30,00,000
B	25,00,000	41,00,000	41/25 = 1.64	(2)	16,00,000
C	50,00,000	70,00,000	70/50 = 1.4	(5)	20,00,000
D	20,00,000	30,00,000	30/20 = 1.5	(3)	10,00,000
E	55,00,000	1,00,00,000	100/55 = 1.8	(1)	45,00,000
F	75,00,000	50,00,000	50/75 = 0.67		-25,00,000

Proposal	Investments (₹)	Cum. Inv. (₹)	NPV (₹)	Cum. NPV
E	55,00,000	55,00,000	45,00,000	45,00,000
B	25,00,000	80,00,000	16,00,000	61,00,000
D	20,00,000	100,00,000	10,00,000	71,00,000

Proposal	Investments (₹)	Cum. Inv. (₹)	NPV (₹)	Cum. NPV
A*	70,00,000	170,00,000	30,00,000	92,42,857*
C	50,00,000	220,00,000	20,00,000	

Feasible Sets	Investments (₹)	NPV (₹)
EBDC	1,50,00,000	91,00,000
EBA	1,50,00,000	91,00,000
BAC	1,45,00,000	66,00,000
DAC	1,40,00,000	60,00,000
EBC	1,30,00,000	81,00,000

Either EBDC or EBA, which provides the maximum NPV, may be undertaken.

PROBLEM 17

WBC & Co. is considering whether to replace an existing machine or to spend money on revamping it. WBC & Co. currently pays no taxes. The replacement machine costs ₹ 18,00,000 now and requires maintenance of ₹ 2,00,000 at the end of every year for eight years. At the end of eight years, it would have a salvage value of ₹ 4,00,000 and would be sold. The existing machine requires increasing amounts of maintenance each year and its salvage value fall each year as follows:

Year	Maintenance (₹)	Salvage (₹)
Present	0	8,00,000
1	2,00,000	5,00,000
2	4,00,000	3,00,000
3	6,00,000	2,00,000
4	8,00,000	0

The opportunity cost of capital for WBC & Co. is 15%. REQUIRED:
When should the company replace the machine?

The following present value table is given for you:

Year	Present value of ₹ 1 at 15% discount rate
1	0.8696
2	0.7561
3	0.6575
4	0.5718
5	0.4972
6	0.4323
7	0.3759
8	0.3269

Solution:

WBC & Co.
Equivalent Annual Cost (EAC) of new machine

		(₹)
(i)	Cost of new machine now	18,00,000
	Add: PV of annual repairs @ ₹ 2,00,000 per annum for 8 years (₹ 2,00,000 x 4.4873)	8,97,460
		26,97,460
	Less: PV of salvage value at the end of 8 years (₹ 4,00,000 x 0.3269)	1,30,760
		25,66,700
	Equivalent annual cost (EAC) (₹ 25,66,700/4.4873)	5,71,992

PV of cost of replacing the old machine in each of 4 years with new machine

Scenario	Year	Cash Flow (₹)	PV @ 15%	PV (₹)
Replace Immediately	0	8,00,000	1.00	8,00,000
	1-4	(5,17,992)	2.8550	(16,33,037)
				(8,33,037)
Replace in one year	1	5,00,000	0.8696	4,34,800
	1	(2,00,000)	0.8696	(1,73,920)
	2-4	(5,71,992)	1.9854	(11,35,633)
				(8,74,753)
Replace in two years	1	(2,00,000)	0.8696	(1,73,920)
	2	(4,00,000)	0.7561	(3,02,440)
	2	3,00,000	0.7561	2,26,830
	3-4	(5,71,992)	1.2293	(7,03,150)
				(9,52,680)
Replace in three years	1	(2,00,000)	0.8696	(1,73,920)
	2	(4,00,000)	0.7561	(3,02,440)
	3	(6,00,000)	0.6575	(3,94,500)
	3	2,00,000	0.6575	1,31,500
	4	(5,71,992)	0.5718	(3,27,065)
				(10,66,425)
Replace in four years	1	(2,00,000)	0.8696	(1,73,920)
	2	(4,00,000)	0.7561	(3,02,440)
	3	(6,00,000)	0.6575	(3,94,500)
	4	(8,00,000)	0.5718	(4,57,440)
				(13,28,300)

Advice: The company should replace the old machine immediately because the PV of cost of replacing the old machine with new machine is least.

CHAPTER 8 DIVIDEND DECISIONS

PROBLEM 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/ 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. CALCULATE the value of the firms when dividends (i) are not paid (ii) are paid

Solution:

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

Step 1: Calculate price at the end of the period

K_e = 10%, P_0 = 100, D_1 = 0

$$P_0 = \frac{P_1 + D_1}{1 + k_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.10} \quad \ggg \quad P_1 = 110$$

Step 2: Calculation of funds required for investment

Earning	₹ 1,00,000
Dividend distributed	Nil
Fund available for investment	₹ 1,00,000
Total Investment	₹ 2,00,000
Balance Funds required	₹ 2,00,000 - ₹ 1,00,000 = ₹ 1,00,000

Step 3: No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end } (P_1)}$$

$$\Delta n = \frac{1,00,000}{110}$$

Step 4: Calculation of value of firm

$$nP_0 = \frac{(n + \Delta n)\, P1 - I + E}{1 + k_e}$$

$$nP_0 = \frac{10,000 + \frac{1,00,000}{110}\, 110 - 2,00,000 + 1,00,000}{(1+0.10)} = 10,00,000$$

CASE 2: Value of the firm when dividends are paid.

Step 1: Calculate price at the end of the period

K_e = 10%, P_0 = 100, D_1 = 5

$$P_0 = \frac{P_1 + D_1}{1 + k_e}$$

$$100 = \frac{P_1 + 5}{1 + 0.10} \quad \ggg \quad P_1 = 105$$

Step 2: Calculation of funds required for investment

Earning	₹ 1,00,000
Dividend distributed	₹ 50,000
Fund available for investment	₹ 50,000
Total investment	₹ 2,00,000
Balance Funds required	₹ 2,00,000 - ₹ 50,000 = ₹ 1,50,000

Step 3: No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end } (P_1)}$$

$$\Delta n = \frac{1,50,000}{105}$$

Step 4: Calculation of value of firm

$$nP_0 = \frac{(n + \Delta n)\, P1 - I + E}{1 + k_e}$$

$$nP_0 = \frac{10,000 + \frac{1,50,000}{105}\, 105 - 2,00,000 + 1,00,000}{(1+0.10)} = 10,00,000$$

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

PROBLEM 2

XYZ Ltd. earns ₹ 10/ share. Capitalization rate and return on investment are 10% and 12% respectively. DETERMINE the optimum dividend payout ratio and the price of the share at the payout.

Solution:

Since $r > K_e$, the optimum dividend pay – out ratio would 'Zero' (i.e. D = 0), Accordingly, value of a share:

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

$$P = \frac{0 + \frac{0.12}{0.10}(10 - 0)}{0.10} = ₹\ 120$$

The optimality of the above payout ratio can be proved by using 25%, 50%, 75% and 100% as pay – out ratio: At 25% pay – out ratio

$$P = \frac{2.5 + \frac{0.12}{0.10}(10 - 2.5)}{0.10} = ₹\ 115$$

At 50% pay – out ratio

$$P = \frac{5 + \frac{0.12}{0.10}(10 - 5)}{0.10} = ₹\ 110$$

At 75% pay – out ratio

$$P = \frac{7.5 + \frac{0.12}{0.10}(10 - 7.5)}{0.10} = ₹\ 105$$

At 100% pay – out ratio

$$P = \frac{10 + \frac{0.12}{0.10}(10 - 10)}{0.10} = ₹\ 100$$

PROBLEM 3

The earnings per share of a company is ₹ 30 and dividend payout ratio is 60%. Multiplier is 2. DETERMINE the price per share as per Graham & Dodd model.

Solution:

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

P = 2 $\left(30 \text{ x } 0.6 + \frac{30}{3}\right)$

P = 2(18 + 10) = ₹ 56

PROBLEM 4

The following information regarding the equity shares of M Ltd. is given below:

Market price	₹ 58.33
Dividend per share	₹ 5
Multiplier	7

According to the Graham & Dodd approach to the dividend policy, COMPUTE the EPS.

Solution:

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

₹ 58.33 = 7 $\left(5 + \frac{E}{3}\right)$

105 + 7E = 175
Or, 7E = 175 – 105 = ₹ 10
Therefore, EPS = ₹ 10

PROBLEM 5

The following information pertains to M/s. XY Ltd.

Earnings of the company	₹ 5,00,000
Dividend Payout ratio	60%
No. of shares outstanding	1,00,000
Equity capitalization rate	12%
Rate of return on investment	15%

CALCULATE:

(i) What would be the market value per share as per Walter model?

(ii) What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?

Solution:

(i) Walter's model is given by

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

Where

P = Market price per share.
E = Earnings per share = ₹ 5
D = Dividend per share = ₹ 3
R = Return earned on investment = 15%
Ke = Cost of equity capital = 12%

$$P = \frac{3+\frac{0.15}{0.12}(5-3)}{0.12}$$

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay – out ratio decreases. Hence, the optimum dividend pay – out ratio in this case is nil.

So, at a pay – out ratio of zero, the market value of the company's share will be:

$$P = \frac{0+\frac{0.15}{0.12}(5-0)}{0.12} = ₹\ 52.08$$

PROBLEM 6

The following information is given below in case of Aditya Ltd.:

Earnings per share = ₹ 60
Capitalization rate – 15%
Return on investment – 25% per cent
Dividend payout ratio – 30%
(i) COMPUTE price per share using Walter's Model
(ii) WHAT would be optimum dividend payout ratio per share under Gordon's Model.

Solution:

(i) As per Walter's Model, Price per share is computed by using the following formula:

$$\text{Price } P = \frac{D+\frac{r}{k_e}(E-D)}{k_e}$$

Where,
P = Market Price of the share.
E = Earnings per share.
D = Dividend per share.
K_e = Cost of equity / rate of capitalization / discount rate. r = Internal rate of return / return on investment
Applying the above formula, price per share

$$P = \frac{\mathbf{18+\frac{0.25}{0.15}(60-18)}}{\mathbf{0.15}}$$

Or, P = $\frac{\mathbf{18 + 70}}{\mathbf{0.15}}$ = ₹ 586.67

(ii) As per Gordon's model, when r > Ke, optimum dividend payout ratio is 'Zero'.

PROBLEM 7

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

Solution:

The P/E ratio i.e. price earnings ratio can be computed with the help of the following formula:

P/E Ratio = $\frac{\text{MPS}}{\text{EPS}}$

Since the D/P ratio is 40%,
D = 40% of E i.e. 0.4E

Hence,
Market price per share (P) using Graham & Dodd's model =

$P_0 = m\ D + \frac{E}{3}$

Where,

P_0 = Market price per share
D = Dividend per share
E = Earnings per share
m = a multiplier

$P_0 = 9\ (0.4E + \frac{E}{3})$

$P_0 = 9\ (\frac{1.2\ E+E}{3}) =$ 3 (2.2E)

P_0 = 6.6E

$\frac{P}{E}$ = 6.6 i.e. P/E ratio is 6.6 times

PROBLEM 8

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:

(i) ANALYSIS whether the company is following an optimal dividend policy.
(ii) COMPUTE P/E ratio at which the dividend policy will have no effect on the value of the share.
(iii) Will your decision change, if the P/E ratio is 8 instead of 12.5? ANALYSE.

Solution:

(i) The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000 / 20,000). r = 2,00,000 / (20,000 shares x ₹ 100) = 10%. The P/E Ratio is given at 12.5 and the cost of capital, Ke, may be taken at the inverse P/E ratio. Therefore, Ke is 8 (i.e., 1/12.5). The firm is distributing total dividends of ₹ 1,50,000 among 20,000 shares, giving a dividend per share of ₹ 7.50, the value of the share as per Walter's model may be found as follows:

$$\text{Price P} = \frac{D+\frac{r}{k_e}(E-D)}{k_e} = \frac{7.5+\frac{0.1}{0.08}(10-7.5)}{0.08} = ₹\ 132.81$$

The firm has a dividend payout of 75% (i.e., ₹ 1,50,000) out of total earnings of ₹ 2,00,000. Since, the rate of return of the firm, r, is 10% and it is more than the Ke of 8%, therefore, by distributing 75% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be

$$\frac{0+\frac{0.1}{0.08}(10-0)}{0.08} = ₹\ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

(ii) 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. The K_e would be 10% (= r) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

(iii) If the P/E is 8 instead of 12.5, then the Ke which is the inverse of P/E ratio, would be 12.5 and in such a situation K_e > r and the market price, as per Walter's model would be:

$$\text{Price P} = \frac{D+\frac{r}{k_e}(E-D)}{k_e} = \frac{7.5+\frac{0.1}{0.125}(10-7.5)}{0.125} = ₹\ 76$$

PROBLEM 9

A & R Ltd. is a large – cap multinational company listed in BSE in India with a face value of ₹ 100 per share. The company is expected to grow @ 15% p.a. for next four years then 5% for an indefinite period. The shareholders expect 20% return on their share investments. Company paid ₹ 120 as dividend per share for the FY 2020 – 21. The shares of the company traded at an average price of ₹ 3,122/- on last day. FIND out the intrinsic value of per share and state whether shares are overpriced or underpriced.

Solution:

$$P = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \frac{D_3}{(1+k_e)^3} + \frac{D_4}{(1+k_e)^4} + \frac{D_4(1+g)}{(k_e-g)} \times \frac{1}{(1+k_e)^4}$$

Where,

P = Price per share

K_e = Required rate of return on equity

g = Growth Rate

$$P = \frac{₹\ 120 \times 1.15}{(1+0.2)^1} + \frac{₹\ 138 \times 1.15}{(1+0.2)^2} + \frac{₹\ 158.7 \times 1.15}{(1+0.2)^3} + \frac{₹\ 182.5 \times 1.15}{(1+0.2)^4} + \frac{₹\ 209.88\ (1+0.05)}{(0.2-0.05)} \times \frac{1}{(1+0.2)^4}$$

P = 115 + 110.2 + 105.6 + 101.2 + 708.60 = ₹ 1,140.64
Intrinsic value of share is ₹ 1,140.64/- as compared to latest market price of ₹ 3,122/-. Market price of a share is overpriced by ₹ 1,981.36 /-.

PROBLEM 10

Ordinary shares of a listed company are currently trading at ₹ 10 per share with two lakh shares outstanding. The company anticipates that its earnings for next year will be ₹ 5,00,000. Existing cost of capital for equity shares is 15%. The company has certain investment proposals under discussion which will cause an additional 26,089 ordinary shares to be issued if no dividend is paid or an additional 47,619 ordinary shares to be issued if dividend is paid.
Applying the MM hypothesis on dividend decisions, CALCULATE the amount of investment and dividend that is under consideration by the company.

Solution:

P_0 = ₹ 10 n = 2,00,000, E = ₹ 5,00,000

K_e = 15%, Δn = 26,089, I = ?

$$P_0 = \frac{P_1}{1+K_e}$$

$$10 = \frac{P_1}{1.15}$$

$\therefore P_1 = 11.5$

$$\Delta n = \frac{I-E+nD_1}{P_1}$$

$$26.089 = \frac{I-5,00,000}{11.5}$$

I = 8,00,024

Now,

P_0 = 10, n = ₹ 2,00,000

E = ₹ 5,00,000, I = 8,00,024,

K_e = 15% , $\Delta n\ 47,619, D1$ = ?

$$P_0 = \frac{P_{1+D_1}}{1+K_e}$$

$$10 = \frac{P_{1+D_1}}{1.15}$$

$P_1 + D_1 = 11.5$

$\therefore P_1 = 11.5 - D_1$……1

$$\because \Delta = \frac{I-E+nD_1}{P_1}$$

$$47.619 = \frac{8,00,024-5,00,000+2,00,000D_1}{P_1}$$

$47,619\ P_1 = 2,00,000\ D_1 + 3,00,024$

From 1,

$47619\ (11.5 - D_1)$ $= 2,00,000\ D_1 + 3,00,024$

$5,47,618.5 - 47,619D_1$ $= 2,00,000D_1 + 3,00,024$

$\therefore\ 2,47,618.5$ $= 2,47,619D_1$

$\therefore\ \mathbf{D_1}$ $= \frac{\mathbf{2,47,618.5}}{\mathbf{2,47,619}} = 0.99 \approx 1$

$\therefore P_1$ $= 11.5 - D_1$

P_1 $= 11.5 - 1$

P_1 $= 10.5$

$\because n.P_0$ $= \frac{(n+\Delta n)P_1 - I + E}{1+K_e}$

$= \frac{(2,00,000+47,619)(10.5) - 8,00,024 + 5,00,000}{1.15}$

$n.P_0$ $= ₹\ 19.99.979 \approx ₹\ 20,00,000$

Using direct calculation,

$n.P_0$ $= 2,00,000 \times 10 = ₹\ 20,00,000$

PROBLEM 11

The annual report of XYZ Ltd. provides the following information for the Financial Year 2019-20:

Particulars	**Amount (₹)**
Net Profit	78 lakhs
Outstanding 15% preference shares	120 lakhs
No. of equity shares	6 lakhs
Return on Investment	20%
Cost of capital i.e. (Ke)	16%

CALCULATE price per share using Gordon's Model when dividend pay-out is-
(i) 30%; (ii) 50% (iii) 100%.

Solution:

Price per share according to Gordon's Model is calculated as follows:

Particulars	**Amount in ₹**
Net Profit	78 lakhs
Less: Preference dividend(120 lakhs@15%)	18 lakhs
Earnings for equity shareholders	60 lakhs
Earnings Per Share	60 lakhs/6 lakhs = ₹ 10.00

Price per share according to Gordon's Model is calculated as follows:

$$P0 = \frac{E_1\ (1-b)}{K_e - br}$$

Here, $E_1 = 10$, $K_e = 16\%$

(i) When dividend pay-out is 30%

$P_0 = \frac{10 \times 0.30}{0.16-(0.70 \times 0.2)} = \frac{3}{0.16-0.14} = ₹ 150$

(ii) When dividend pay-out is 50%

$P_0 = \frac{10 \times 0.5}{0.16-(0.5 \times 0.2)} = \frac{5}{0.16-0.10} = ₹ 83.33$

(iii) When dividend pay-out is 100%

$P_0 = \frac{\mathbf{10 \times 1}}{\mathbf{0.16-(0x\ 0.2)}} = \frac{\mathbf{10}}{\mathbf{0.16}} = ₹ 62.5$

PROBLEM 12

Following information is given for WN Ltd.:

Earnings	₹ 30 per share
Dividend	₹ 9 per share
Cost of capital	15%
Internal Rate of Return on investment	20%

You are required to CALCULATE the market price per share using-

(i) Gordon's formula

(ii) Walter's formula

Solution:

(i) As per Gordon's Model, Price per share is computed using the formula:

$P_0 = \frac{E_1(1-b)}{K_e-br}$

Where,

P_0 = Price per share

E_1 = Earnings per share

b = Retention ratio; (1 - b = Pay-out ratio)

K_e = Cost of capital

r = IRR

b_r = Growth rate (g)

Applying the above formula, price per share

$P = \frac{9+\frac{0.20}{0.15}(30-9)}{0.15} = \frac{37}{0.15} = ₹ 246.67$

CHAPTER 9 MANAGEMENT OF WORKING CAPITAL

PROBLEM 1

A firm has the following data for the year ending 31st March, 2023:

	(₹)
Sales (1,00,000 @ ₹ 20)	20,00,000
Earnings before Interest and Taxes	2,00,000
Fixed Assets	5,00,000

The three possible current assets holdings of the firm are ₹ 5,00,000, ₹ 4,00,000 and ₹ 3,00,000. It is assumed that fixed assets level is constant and profits do not vary with current assets levels. ANALYSIS the effect of the three alternative current assets policies.

Solution:

Effect of Alternative Working Capital Policies

Working Capital Policy	Conservative (₹)	Moderate (₹)	Aggressive (₹)
Sales	20,00,000	20,00,000	20,00,000
Earnings before Interest and Taxes (EBIT)	2,00,000	2,00,000	2,00,000
Current Assets	5,00,000	4,00,000	3,00,000
Fixed Assets	5,00,000	5,00,000	5,00,000
Total Assets	10,00,000	9,00,000	8,00,000
Return on Total Assets (EBIT ÷ Total Assets)	20%	22.22%	25%
Current Assets/ Fixed Assets	1.00	0.80	0.60

The aforesaid calculation shows that the conservative policy provides greater liquidity (solvency) to the firm, but lower return on total assets. On the other hand, the aggressive policy gives higher return, but low liquidity and thus is very risky. The moderate policy generates return higher than Conservative policy but lower than aggressive policy. This is les risky than aggressive policy but risker than conservative policy.
In determining the optimum level of current assets, the firm should balance the profitability – solvency tangle by minimizing total costs – Cost of liquidity and cost of illiquidity.

PROBLEM 2

PREPARE monthly cash budget for six months beginning from April 2023 on the basis of the following information:

(i) Estimated monthly sales are as follows:-

	₹		₹
January	1,00,000	June	80,000
February	1,20,000	July	1,00,000
March	1,40,000	August	80,000
April	80,000	September	60,000
May	60,000	October	1,00,000

(ii) Wages and salaries are estimated to be payable as follows:

	₹		₹
April	9,000	July	10,000
May	8,000	August	9,000
June	10,000	September	9,000

(iii) Of the sales, 80% is on credit and 20% for cash. 75% of the credit sales are collected within one month after sale and the balance in two months after sale. There are no bad debt losses.

(iv) Purchases amount to 80% of sales and are made on credit and paid for in the month preceding the sales.

(v) The firm has 10% debentures of ₹ 1,20,000. Interest on these has to be paid quarterly in January, April and so on.

(vi) The firm is to make an advance payment of tax of ₹ 5,000 in July, 2023.

(vii) The firm had a cash balance of ₹ 20,000 on April 1, 2023, which is the minimum desired level of cash balance. Any cash surplus / deficit above / below this level is made up by temporary investments / liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

Solution:

Workings:

Collection from debtors:

(Amount in ₹)

	February	**March**	**April**	**May**	**June**	**July**	**August**	**September**
Total Sales	1,20,000	1,40,000	80,000	60,000	80,000	1,00,000	80,000	60,000
Credit sales (80% of total sales)	96,000	1,12,000	64,000	48,000	64,000	80,000	64,000	48,000
Collections:								
One month		72,000	84,000	48,000	36,000	48,000	60,000	48,000
Two months			24,000	28,000	16,000	12,000	16,000	20,000
Total collections			1,08,000	76,000	52,000	60,000	76,000	68,000

Monthly Cash Budget for Six months, April to September, 2023

(Amount in ₹)

Receipts:						
	April	May	June	July	August	September
Opening balance	20,000	20,000	20,000	20,000	20,000	20,000
Cash sales	16,000	12,000	16,000	20,000	16,000	12,000
Collection from debtors	1,08,000	76,000	52,000	60,000	76,000	68,000
Total cash available (A)	1,44,000	1,08,000	88,000	1,00,000	1,12,000	1,00,000
Payments:						
Purchases	48,000	64,000	80,000	64,000	48,000	80,000
Wages & Salaries	9,000	8,000	10,000	10,000	9,000	9,000
Interest on debentures	3,000	---	---	3,000	---	---
Tax payment	---	---	---	5,000	---	---
Total payments (B)	60,000	72,000	90,000	82,000	57,000	89,000
Minimum cash balance desired	20,000	20,000	20,000	20,000	20,000	20,000

Total cash needed (C)	80,000	92,000	1,10,000	1,02,000	77,000	1,09,000
Surplus – deficit (A – C)	64,000	16,000	(22,000)	(2,000)	35,000	(9,000)
Investment / financing Temporary Investments	(64,000)	(16,000)	---		(35,000)	---
Liquidation of temporary investments or temporary borrowings	---	---	22,000	2,000	---	9,000
Total effect of investment / financing (D)	(64,000)	(16,000)	22,000	2,000	(35,000)	9,000
Closing cash balance (A + D – B)	20,000	20,000	20,000	20,000	20,000	20,000

PROBLEM 3

The following information is available in respect of Sai Trading Company:

(i) On an average, debtors are collected after 45 days; inventories have an average holding period of 75 days and creditor's payment period on an average is 30 days.

(ii) The firm spends a total of ₹ 120 lakhs annually at a constant rate.

(iii) It can earn 10 per cent on investments.

From the above information, you are required to CALCULATE:

(a) The cash cycle and cash turnover,

(b) Minimum amounts of cash to be maintained to meet payments as they become due,

(c) Savings by reducing the average inventory holding period by 30 days.

Solution:

(a) Cash cycle = 45 days + 75 days – 30 days = 90 days (3 months)

(b) Cash turnover = 12 months (360 days)/ 3 months (90 days) = 4.

(c) Minimum operating cash = Total operating annual outlay/cash turnover, that is, ₹ 120 lakhs / 4 = ₹ 30 lakhs.

(d) Cash cycle = 45 days + 45 days – 30 days = 60 days (2 months).

Cash turnover = 12 months (360 days) / 2 months (60 days) = 6.

Minimum operating cash = ₹ 120 lakhs / 6 = ₹ 20 lakhs.

Reduction in investments = ₹ 30 lakhs - ₹ 20 lakhs = ₹ 10 lakhs. Savings = 0.10 x ₹ 10 lakhs = ₹ 1 lakh.

PROBLEM 4

A company's requirements for ten days are 6,300 units. The ordering cost per order is ₹ 10 and the carrying cost per unit is ₹ 0.26. You are required to CALCULATE the economic order quantity.

Solution:

The economic order quantity is:

$$EOQ = \sqrt{\frac{2 \times 6{,}300 \times 10}{0.26}} = EOQ = \sqrt{\frac{1{,}26{,}000}{0.26}} = 700 \text{ units (approx.).}$$

PROBLEM 5

Marvel Limited uses a large quantity of salt in its production process. Annual consumption is 60,000 tonnes over a 50 – week working year. It costs ₹ 100 to initiate and process an order and delivery follow two weeks later. Storage costs for the salt are estimated at ₹ 0.10 per tonne per annum. The current practice is to order twice a year when the stock falls to 10,000 tonnes. IDENTIFY an appropriate ordering policy for Marvel Limited, and contrast it with the cost of the current policy.

Solution:

The recommended policy should be based on the EOQ model.
F = ₹ 100 per order

S = 60,000 tonnes per year

H = ₹ 0.10 per tonne per year

Substituting: EOQ $= \sqrt{\frac{2 \text{ x } 100 \text{ x } 60{,}000}{0.10}}$

= 10,954 tonnes per order

Number of orders per year = 60,000 / 10,954 = 5.5.

orders Re – order level = 2 x 60,000 / 50 = 2,400 tonnes

Total cost of optimum policy = holding costs + ordering costs

= (0.1 x 10954) /2 + (100 x 60,000) / 10,954

= 547.70 + 547.74 = ₹ 1,095

To compare the optimum policy with the current policy, the average level of stock under the current policy must be found. An order is placed when stock falls to 10,000 tonnes, but the lead time is two weeks. The stock used in that time is (60,000 x 2)/50 = 2,400 tonnes. Before delivery, inventory has fallen to (10,000 – 2,400) = 7,600 tonnes. The order will increase stock level to 30,000 + 7,600 = 37,600 tonnes. Hence the average stock level = 7,600 + (30,000/2) = 22,600 tonnes. Total costs of current policy = (0.1 x 22,600) + (100 x 2) = ₹ 2,460 per year.
Advise: The recommended policy should be adopted as the costs are less than the current policy (by ₹ 1,365 per year).

PROBLEM 6

Mosaic Limited has current sales of ₹ 15 lakhs per year. Cost of sales is 75 per cent of sales and bad debts are one per cent of sales. Cost of sales comprises 80 per cent variable costs and 20 per cent fixed costs, while the company's required rate of return is 12 per cent. Mosaic Limited currently allows customers 30 days' credit, but is considering increasing this to 60 days' credit in order to increase sales.
It has been estimated that this change in policy will increase sales by 15 per cent, while bad debts will increase from one per cent to four per cent. It is not expected that the policy change will result in an increase in fixed costs and creditors and stock will be unchanged.

Should Mosaic Limited introduce the proposed policy? ANALYSE (Assume a 360 days year)

Solution:

Statement showing evaluation of credit policy

Particulars	30 days	60 days
Sales-	15,00,000	17,25,000
(-) Variable cost (Sales x 75% x 80%)	9,00,000	10,35,000
Contribution	6,00,000	6,90,000
(-) Fixed cost (15,00,000 x 75% x 20%)	2,25,000	2,25,000
EBIT	3,75,000	4,65,000
(-) Bad Debts @ 1% & 4% respectively	15,000	69,000
Net profit	3,60,000	3,96,000
(-) Finance cost VC + FC x 12% x Credit Period / 360	11,250	25,200
Net benefit	**3,48,750**	**3,70,800**

Advise: Mosaic Limited should introduce the proposed policy since the net benefit is higher.

PROBLEM 7

The Dolce Company purchases raw materials on terms of 2/10, net 30. A review of the company's records by the owner, Mr. Gautam, revealed that payments are usually made 15 days after purchases are made. When asked why the firm did not take advantage of this discount, the accountant, Mr. Rohit, replied that it cost only 2 per cent for these funds, whereas a bank loan would cost the company 12 per cent.

(a) ANALYSE what mistake is Rohit making?

(b) If the firm could not borrow from the bank and was forced to resort to the use of trade credit funds, what suggestion might be made to Rohit that would reduce the annual interest cost? IDENTIFY.

Solution:

(a) Rohit's argument of comparing 2% discount with 12% bank loan rate is not rational as 2% discount can be earned by making payment 5 days in advance i.e. within 10 days rather 15 days as payments are made presently. Whereas 12% bank loan rate is for a year.

Assume that the purchase value is ₹ 100, the discount can be earned by making payment within 10 days is ₹ 2, therefore, net payment would be ₹ 98 only. Annualized benefit

$$= \frac{2}{98} \text{ x } \frac{365 \text{ days}}{5 \text{ days}} \text{ x } 100 = 149 \%$$

This means cost of not taking cash discount is 149%

(b) If the bank loan facility could not be available, then in this case the company should resort to utilize maximum credit period as possible.
Therefore, payment should be made in 30 days to reduce the interest cost.

PROBLEM 8

K Ltd. has a Quarterly cash outflow of ₹ 9,00,000 arising uniformly during the Quarter. The company has an Investment portfolio of Marketable Securities. It plans to meet the demands for cash by periodically selling marketable securities. The marketable securities are generating a return of 12% p.a. Transaction cost of converting investments to cash is ₹ 60. The company uses Baumol model to find out the optimal transaction size for converting marketable securities into cash.
Consider 360 days in a year.

You are required to calculate

i) Company's average cash balance,

ii) Number of conversions each year and

iii) Time interval between two conversions.

Solution:

$$EOQ = \sqrt{\frac{2AT}{I}}$$

A = 9,00,000 x 4 = 36,00,000/-

T = 60/- per transaction

I = 12% p.a.

$$\therefore EOQ = \sqrt{\frac{2 \times 36,00,000 \times 60}{0.12}}$$

= ₹ 60,000/-

$$\therefore \text{Average cash balance} = \frac{60,000}{2}$$

= ₹ 30,000/-

$$\therefore \text{No. of conversion} = \frac{36,00,000}{60,000}$$

= 60 times

$$\therefore \text{Time interval between 2 conversions} = \frac{360}{60} = 6 \text{ days}$$

PROBLEM 9

Trading and Profit and Loss Account of Beat Ltd. for the year ended 31st March, 2023 is given below

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To Opening Stock:			By Sales (Credit)		1,60,00,000
- Raw Materials	14,40,000		By Closing Stock:		
- Work-in- progress	4,80,000		- Raw Materials	16,00,000	
- Finished Goods	20,80,000	40,00,000	- Work-in-progress	8,00,000	
To Purchases (credit)		88,00,000	- Finished Goods	24,00,000	48,00,000
To Wages		24,00,000			
To Production Exp.		16,00,000			
To Gross Profit c/d		40,00,000			
		2,08,00,000			2,08,00,000
To Administration Exp.		14,00,000	By Gross Profit b/d		40,00,000
To Selling Exp.		6,00,000			
To Net Profit		20,00,000			
		40,00,000			40,00,000

The opening and closing payables for raw materials were ₹ 16,00,000 and ₹ 19,20,000 respectively whereas the opening and closing balances of receivables were ₹ 12,00,000 and ₹ 16,00,000 respectively.
You are required to ASCERTAIN the working capital requirement by operating cycle method.

Solution:

Computation of Operating Cycle

(i) Raw Material Storage Period (R)

Raw Material Storage Period (R) $= \frac{\textbf{Average stock of raw material}}{\textbf{Daily average consumption of raw material}}$

$= \frac{(\mathbf{14,40,000+16,00,000})/\mathbf{2}}{\mathbf{86,40,000/365}}$ = 64.21 Days

Raw Material Consumed = Opening Stock + Purchases – Closing Stock

= ₹ 14,40,000 + ₹ 88,00,000 –₹ 16,00,000 = ₹ 86,40,000

(ii) Conversion/Work-in-Process Period (W)

Conversion/Processing Period $= \frac{\textbf{Average stock of WIP}}{\textbf{Daily Average Production Cost}}$

$= \frac{(\mathbf{4,80,000+8,00,000})/\mathbf{2}}{\mathbf{1,23,20,000/365}}$ = 18.96 Days

Production Cost:	₹
Opening Stock of WIP	4,80,000
Add: Raw Material Consumed	86,40,000
Add: Wages	24,00,000
Add: Production Expenses	16,00,000
	1,31,20,000
Less: Closing Stock of WIP	8,00,000
Production Cost	1,23,20,000

(iii) Finished Goods Storage Period (F)

Finished Goods Storage Period $= \frac{\text{Average stock of finished goods}}{\text{Daily average cost of good sold}}$

$= \frac{(20,80,000+24,00,000)/2}{1,20,00,000/365} = 68.13$ days

Cost of goods sold	₹
Opening Stock of Finished Goods	20,80,000
Add: Production Cost	1,23,20,000
	1,44,00,000
Less: Closing Stock of Finished Goods	(24,00,000)
	1,20,00,000

(iv) Receivables Collection Period (D)

Receivables Collection Period $= \frac{\text{Average Receivables}}{\text{Daily average credit sales}}$

$= \frac{(12,00,000+16,00,000)/2}{1,60,00,000/365} = 31.94$ Days

(v) Payables Payment Period (C)

Payables Payment Period $= \frac{\text{Average payables}}{\text{Daily average credit purchase}}$

$= \frac{(16,00,000+19,20,000)/2}{88,00,000/365} = 73$ Days

(vi) Duration of Operating Cycle (O)

O = R + W + F + D – C

= 64.21 + 18.96 + 68.13 + 31.94 – 73

= 110.24 days

Computation of Working Capital

i. Number of Operating Cycles per Year = 365/Duration Operating Cycle = 365/110.24 = 3.311

ii. Total Operating Expenses

	₹
Total Cost of Goods sold	1,20,00,000
Add: Administration Expenses	14,00,000
Add: Selling Expenses	6,00,000
	1,40,00,000

iii. Working Capital Required

Working Capital Required $= \frac{\text{Total Operating expenses}}{\text{Number of operating cycle per year}}$

$= \frac{1,40,00,000}{3.311} =$ ₹ 42,28,329.81

PROBLEM 10

GT Ltd. is taking into account the revision of its credit policy with a view to increasing its sales and profit. Currently, all its sales are on one month credit. Other information is as follows:

Contribution	2/5th of Sales Revenue
Additional funds raising cost	20% per annum

The marketing manager of the company has given the following options along with estimates for considerations:

Particulars	Current Position	Option I	Option II	Option III
Sales Revenue (₹)	40,00,000	42,00,000	44,00,000	50,00,000
Credit period (in months)	1	1½	2	3
Bad debts (% of sales)	2	2½	3	5
Cost of Credit administration (₹)	24,000	26,000	30,000	60,000

You are required to ADVISE the company for the best option.

Statement Showing Evaluation of Credit Policies

(₹ in lakhs)

Particulars	Current position (1 month)	Option I (1.5 months)	Option II (2 months)	Option III (3 months)
Sales Revenue	40,00,000	42,00,000	44,00,000	50,00,000
Contribution @ 40%	16,00,000	16,80,000	17,60,000	20,00,000
Increase in contribution over current level (A)	-	80,000	1,60,000	4,00,000
Debtors = $\left(\frac{\text{Average collection period x Credit sale}}{12}\right)$	$\frac{1 \times 40,00,000}{12}$ = 3,33,333.33	$\frac{1.5 \times 42,00,000}{12}$ = 5,25,000	$\frac{2 \times 44,00,000}{12}$ = 7,33,333.33	$\frac{3 \times 50,00,000}{12}$ = 12,50,000
Increase in debtors over current level	-	1,91,666.67	4,00,000.00	9,16,666.67
Cost of funds for additional amount of debtors @ 20% (B)	-	38,333.33	80,000.00	1,83,333.33
Credit administrative cost	24,000	26,000	30,000	60,000
Increase in credit administration cost over present level (C)	-	2,000	6,000	36,000
Bad debts	80,000	1,05,000	1,32,000	2,50,000
Increase in bad debts over current levels (D)	-	25,000	52,000	1,70,000
Net gain/loss A – (B + C + D)	-	14,666.67	22,000.00	10,666.67

Advise: It is suggested that the company GT Ltd. should implement Option II with a net gain of ₹ 22,000 which has a credit period of 2 months

PROBLEM 11

Avesh Pvt. Ltd. is considering relaxing its present credit policy for accounts receivable and is in the process of evaluating two proposed policies. Currently, the company has annual credit sales of ₹ 55 lakhs and accounts receivable turnover ratio of 5 times a year. The current level of loss due to bad debts is ₹ 2,00,000. The company is required to give a return of 15% on the investment in new accounts receivable. The company's variable costs are 75% of the selling price. Given the following information, IDENTIFY which is the better policy?

(Amount in ₹)

Particulars	**Present Policy**	**Proposed Policy 1**	**Proposed Policy 2**
Annual credit sales	55,00,000	65,00,000	70,00,000
Accounts receivable turnover ratio	5 times	4 times	3 times
Bad debt losses	2,00,000	3,50,000	5,00,000

Solution:

Statement showing the Evaluation of Accounts Receivable Policies

(Amount in ₹)

	Particulars	**Present Policy**	**Proposed Policy 1**	**Proposed Policy 2**
A	Expected Profit:			
	(a) Credit Sales	55,00,000	65,00,000	70,00,000
	(b) Total Cost other than Bad Debts:			
	(i) Variable Costs (75%)	41,25,000	48,75,000	52,50,000
	(c) Bad Debts	2,00,000	3,50,000	5,00,000
	(d) Expected Profit [(a) – (b) – (c)]	11,75,000	12,75,000	12,50,000
B	Opportunity Cost of Investments in Accounts Receivable (Working Note)	1,23,750	1,82,813	2,62,500
C	Net Benefits (A – B)	10,51,250	10,92,187	9,87,500

Recommendation: The Proposed Policy 1 should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Note:

Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × Collection period/12 × Rate of Return/100

Present Policy = ₹ 41,25,000 × 2.4/12 × 15% = ₹1,23,750

Proposed Policy 1 = ₹ 48,75,000× 3/12 × 15% = ₹ 1,82,813

Proposed Policy 2 = ₹ 52,50,000× 4/12 × 15% = ₹ 2,62,500

PROBLEM : 12

PREPARE a working capital estimate to finance an activity level of 52,000 units a year (52 weeks) based on the following data:

Raw Materials - ₹ 400 per unit

Direct Wages - ₹ 150 per unit

Overheads (Manufacturing) - ₹200 per unit

Overheads (Selling & Distribution) - ₹100 per unit

Selling Price - ₹ 1,000 per unit, Raw materials & Finished Goods remain in stock for 4 weeks, Work in process takes 4 weeks. Debtors are allowed 8 weeks for payment whereas creditors allow us 4 weeks. Minimum cash balance expected is ₹ 50,000. Receivables are valued at Selling Price.

Solution:

Cost Structure for 52000 units	
Particulars	**Amount (₹)**
Raw Material @ ₹ 400	2,08,00,000
Direct Wages @ ₹ 150	78,00,000
Manufacturing Overheads @ ₹ 200	1,04,00,000
Selling and Distribution OH @ ₹ 100	52,00,000
Total Cost	4,42,00,000
Sales @₹1000	5,20,00,000

Particulars	**Calculation**	**Amount (₹)**
A. Current Assets:		
Raw Material Stock	2,08,00,000 x $\frac{4}{52}$	16,00,000
Work in Progress (WIP) Stock	2,08, 00, 000 + $\frac{78,00,000 + 1,04,00,000}{2}$ x $\frac{4}{52}$	23,00,000
Finished Goods Stock	4, 42,00,000 x $\frac{4}{52}$	34,00,000
Receivables	5,20,00,000 x $\frac{8}{52}$	80,00,000
Cash		50,000
	Total Current Assets	1,53,50,000
B. Current Liabilities:		
Creditors	20800000 x $\frac{4}{52}$	16,00,000
Working Capital Estimates (A-B)		1,37,50,000

PROBLEM : 13

The following information is available in respect of Sai trading company:

(i) On an average, debtors are collected after 45 days; inventories have an average holding period of 75 days and creditor's payment period on an average is 30 days.

(ii) The firm spends a total of ₹ 120 lakhs annually at a constant rate.

(iii) It can earn 10 per cent on investments.

From the above information, you are required to CALCULATE:

(a) The cash cycle and cash turnover,

(b) Minimum amounts of cash to be maintained to meet payments as they become due,

(c) Savings by reducing the average inventory holding period by 30 days.

Solution:

(a) Cash cycle = 45 days + 75 days – 30 days = 90 days (3 months) Cash turnover = 12 months (360 days)/3 months (90 days) = 4.

(b) Minimum operating cash = Total operating annual outlay/cash turnover, that is, ₹ 120 lakhs/4 = ₹ 30 lakhs.

(c) Cash cycle = 45 days + 45 days – 30 days = 60 days (2 months). Cash turnover = 12 months (360 days)/2 months (60 days) = 6. Minimum operating cash = ₹ 120 lakhs/6 = ₹ 20 lakhs. Reduction in investments = ₹ 30 lakhs – ₹ 20 lakhs = ₹ 10 lakhs. Savings = 0.10 x ₹ 10 lakhs = ₹ 1 lakh.

PROBLEM : 14

Suppose ABC Ltd. has been offered credit terms from its major supplier of 2/10, net 45. Hence the company has the choice of paying ₹ 10 per ₹ 100 or to invest ₹ 98 for an additional 35 days and eventually pay the supplier ₹ 100 per ₹ 100. The decision as to whether the discount should be accepted depends on the opportunity cost of investing ₹ 98 for 35 days. ANALYSE what should the company do?

Solution:

If the company does not avail the cash discount and pays the amount after 45 days, the implied cost of interest per annum would be approximately:

$\left(\frac{100}{100-2}\right)^{\frac{365}{35}}$ - 1 = 23.5%

Now let us assume that ABC Ltd. can invest the additional cash and can obtain an annual return of 25% and if the amount of invoice is ₹ 10,000. The alternatives are as follows:

	Refuse discount	**Accept discount**
	₹	₹
Payment to supplier	10,000	9,800
Return from investing ₹ 9,800 between day 10 and day 45: $\frac{35}{365}$ x ₹ 9,800 x 25%	(235)	
Net Cost	9,765	9,800

Advise: Thus, it is better for the company to refuse the discount, as return on cash retained is more than the saving on account of discount.

PROBLEM : 15

The Dolce Company purchases raw materials on terms of 2/10, net 30. A review of the company's records by the owner, Mr. Gautam, revealed that payments are usually made 15 days after purchases are made. When asked why the firm did not take advantage of its discounts, the accountant, Mr. Rohit, replied that it cost only 2 per cent for these funds, whereas a bank loan would cost the company 12 per cent.

(a) ANALYSE what mistake is Rohit making?

(b) If the firm could not borrow from the bank and was forced to resort to the use of trade credit funds, what suggestion might be made to Rohit that would reduce the annual interest cost? IDENTIFY.

Solution:

(a) Rohit's argument of comparing 2% discount with 12% bank loan rate is not rational as 2% discount can be earned by making payment 5 days in advance i.e. within 10 days rather 15 days as payments are made presently. Whereas 12% bank loan rate is for a year.

Assume that the purchase value is ₹ 100, the discount can be earned by making payment within 10 days is ₹ 2, therefore, net payment would be ₹ 98 only. Annualized benefit

$= \frac{\text{Rs.2}}{\text{Rs.98}} \text{ x } \frac{\text{365 days}}{\text{5 days}} \text{ x } 100 = 149\%$

This means cost of not taking cash discount is 149%.

(b) If the bank loan facility could not be available, then in this case the company should resort to utilise maximum credit period as possible.
Therefore, payment should be made in 30 days to reduce the interest cost.

PROBLEM : 16

The following figures and ratios are related to a company:

(i)	Sales for the year (all credit)	₹ 90,00,000
(ii)	Gross Profit ratio	35 percent
(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1.5:1
(vi)	Current ratio	2.5:1
(vii)	Receivables (Debtors) collection period	1 month
(viii)	Reserves and surplus to Share capital	1:1.5
(ix)	Capital gearing ratio	0.7875
(x)	Fixed assets to net worth	1.3 : 1

You are required to PREPARE:

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

(b) The statement showing working capital requirement, if the company wants to make a provision for contingencies @15 percent of net working capital.

Solution:

Working Notes:

(i) Cost of Goods Sold = Sales – Gross Profit (35% of Sales)
= ₹ 90,00,000 – ₹ 31,50,000
= ₹ 58,50,000

(ii) Closing Stock = Cost of Goods Sold / Stock Turnover
= ₹ 58,50,000/6 = ₹ 9,75,000

(iii) Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover

= ₹ 58,50,000/1.5
= ₹ 39,00,000

(iv) Current Assets and Current Liabilities
Current Ratio = 2.5 and Liquid Ratio = 1.5
CA / CL = 2.5 … (i)
(CA – Inventories) / CL = 1.5 …(ii)
By subtracting equation (ii) from (i), we get, Inventories / CL = 1
Current Liabilities = Inventories (stock) = ₹ 9,75,000
∴ Current Assets = ₹ 9,75,000 x 2.5 = ₹ 24,37,500

Or

Current Ratio / Quick Ratio = Current Assets / Quick Assets
2.5 / 1.5 = Current Assets / (Current Assets – Inventory)
2.5/1.5 Current Assets – 2.5/1.5 x ₹ 9,75,000 = Current Assets
Hence, Current Assets = ₹ 24,37,500

(v) Liquid Assets (Receivables and Cash)
= Current Assets – Inventories (Stock)
= ₹ 24,37,500 – ₹ 9,75,000
= ₹14,62,500

(vi) Receivables (Debtors) = Sales x Debtors Collection period /12
= ₹ 90,00,000 x 1/12
= ₹ 7,50,000

(vii) Cash = Liquid Assets – Receivables (Debtors)
= ₹14,62,500 – ₹ 7,50,000 = ₹ 7,12,500

(viii) Net worth = Fixed Assets /1.3
= ₹ 39,00,000/1.3 = ₹ 30,00,000

(ix) Reserves and Surplus
Reserves and Surplus / Share Capital = 1/1.5
Share Capital= 1.5 Reserves and Surplus … (i)
Now, Reserves and Surplus + Share Capital = Net worth … (ii)
From (i) and (ii), we get,
2.5 Reserves and Surplus = Net worth
Reserves and Surplus = ₹ 30,00,000 / 2.5 = ₹ 12,00,000

(x) Share Capital = Net worth – Reserves and Surplus
= ₹ 30,00,000 – ₹ 12,00,000
= ₹ 18,00,000

(xi) Long-term Debts
Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund
Long-term Debts = ₹ 30,00,000 x 0.7875 = ₹ 23,62,500

(a) Balance Sheet of the Company

Particulars	Figures as the end of 31-03-2021 (₹)	Figures as the end of 31-03-2020 (₹)
I. EQUITY AND LIABILITIES		
Shareholders' funds		
(a) Share capital	18,00,000	-
(b) Reserves and surplus	12,00,000	-
Non-current liabilities		
(a) Long-term borrowings	23,62,500	-
Current liabilities	9,75,000	-
TOTAL	63,37,500	-
II. ASSETS		
Non-current assets		
Fixed assets	39,00,000	-
Current assets		
Inventories	9,75,000	-
Trade receivables	7,50,000	-
Cash and cash equivalents	7,12,500	-
TOTAL	**63,37,500**	-

(b) Statement Showing Working Capital Requirement

	(₹)	(₹)
A. Current Assets		
(i) Inventories (Stocks)		9,75,000
(ii) Receivables (Debtors)		7,50,000
(iii) Cash in hand & at bank		7,12,500
Total Current Assets		24,37,500
B. Current Liabilities:		
Total Current Liabilities		9,75,000
Net Working Capital (A – B)		14,62,500
Add: Provision for contingencies (15% of Net Working Capital)		2,19,375
Working capital requirement		16,81,875

PROBLEM : 17

PQ Ltd., a company newly commencing business in 2022-23 has the following projected Profit and Loss Account:

	(₹)	(₹)
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	
	1,70,000	
Less: Stock of Finished goods		
(10% of goods produced not yet sold)	17,000	
	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 1-1/2 months credit. Sales will be 20% for cash and the rest at two months' credit. 70% of the Income tax will be paid in advance in quarterly instalments. 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.

Note: All workings should form part of the answer.

Solution:

Statement showing the requirements of Working Capital

Particulars	**(₹)**	**(₹)**
A. Current Assets:		
Inventory:		
Stock of Raw material (₹ 96,600 x 2/12)	16,100	
Stock of Work-in-progress (As per Working Note)	16,350	
Stock of Finished goods (₹ 1,46,500 x 10/100)	14,650	
Receivables (Debtors) (₹1,27,080 x 2/12)	21,180	
Cash in Hand	8,000	
Prepaid Expenses:		
Wages & Mfg. Expenses (₹ 66,250 x 1/12)	5,521	
Administrative expenses (₹ 14,000 x 1/12)	1,167	
Selling & Distribution Expenses (₹13,000 x 1/12)	1,083	
Advance taxes paid {(70% of ₹ 10,000) x 3/12}	1,750	
Gross Working Capital	85,801	85,801
B. Current Liabilities:		
Payables for Raw materials (₹ 1,12,700 x 1.5/12)	14,088	
Provision for Taxation (Net of Advance Tax) (₹ 10,000 x 30/100)	3,000	
Total Current Liabilities	17,088	17,088
C. Excess of CA over CL		68,713
Add: 10% for unforeseen contingencies		6,871
Net Working Capital requirements		75,584

Working Notes:

(i) Calculation of Stock of Work-in-progress

Particulars	(₹)
Raw Material (₹ 84,000 x 15%)	12,600
Wages & Mfg. Expenses (₹ 62,500 x 15% x 40%)	3,750
Total	16,350

(ii) Calculation of Stock of Finished Goods and Cost of Sales

Particulars	(₹)
Direct material Cost [₹ 84,000 + ₹ 12,600]	96,600
Wages & Mfg. Expenses [₹62,500 + ₹ 3,750]	66,250
Depreciation	0
Gross Factory Cost	1,62,850
Less: Closing W.I.P	(16,350)
Cost of goods produced	1,46,500
Add: Administrative Expenses	14,000
	1,60,500
Less: Closing stock	(14,650)
Cost of Goods Sold	1,45,850
Add: Selling and Distribution Expenses	13,000
Total Cash Cost of Sales	1,58,850
Debtors (80% of cash cost of sales)	1,27,080

(iii) Calculation of Credit Purchase

Particulars	(₹)
Raw material consumed	96,600
Add: Closing Stock	16,100
Less: Opening Stock	-
Purchases	1,12,700

PROBLEM : 18

The management of Trux Company Ltd. is planning to expand its business and consults you to prepare an estimated working capital statement. The records of the company reveals the following annual information:

	(₹)
Sales – Domestic at one month's credit	18,00,000
Export at three month's credit (sales price 10% below domestic price)	8,10,000
Materials used (suppliers extend two months credit)	6,75,000
Lag in payment of wages – ½ month	5,40,000
Lag in payment of manufacturing expenses (cash) – 1 month	7,65,000
Lag in payment of Administration Expenses – 1 month	1,80,000
Selling expenses payable quarterly in advance	1,12,500
Income tax payable in four installments, of which one falls in the next financial year	1,68,000

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 10% margin for contingencies on computed figure.

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

Solution:

Preparation of Statement of Working Capital Requirement for Trux Company Ltd.

	(₹)	(₹)
A. Current Assets		
(i) Inventories:		
Material (1 month) $\left[\frac{Rs.6,75,000}{12\ months} \times 1\ month\right]$	56,250	
Finished goods (1 month) $\left[\frac{Rs.21,60,000}{12\ months} \times 1\ month\right]$	1,80,000	2,36,250
(ii) Receivables (Debtors)		
For Domestic Sales $\left[\frac{Rs.15,17,586}{12\ months} \times 1\ month\right]$	1,26,466	
For Export Sales $\left[\frac{Rs.7,54,914}{12\ months} \times 3\ months\right]$	1,88,729	3,15,195
(iii) Prepayment of Selling expenses $\left[\frac{Rs.1,12,500}{12\ months} \times 3\ months\right]$		28,125
(iv) Cash in hand & at bank (net of overdraft)		1,75,000
Total Current Assets		7,54,570
B. Current Liabilities:		
(i) Payables (Creditors) for materials (2 months) $\left[\frac{Rs.6,75,000}{12\ months} \times 2\ months\right]$		1,12,500
(ii) Outstanding wages (0.5 months) $\left[\frac{Rs.5,40,000}{12\ months} \times 0.5\ months\right]$		22,500
(iii) Outstanding manufacturing expenses $\left[\frac{Rs.7,65,000}{12\ months} \times 1\ months\right]$		63,750
(iv) Outstanding administrative expenses $\left[\frac{Rs.1,80,000}{12\ months} \times 1\ months\right]$		15,000
(v) Income tax payable		42,000
Total Current Liabilities		2,55,750
Net Working Capital (A – B)		4,98,820
Add: 10% contingency margin		49,882
Total Working Capital required		5,48,702

Working Notes:

1. Calculation of Cost of Goods Sold and Cost of Sales

	Domestic (₹)	Export (₹)	Total (₹)
Domestic Sales	18,00,000	8,10,000	26,10,000
Less: Gross profit @ 20% on domestic sales and 11.11% on export sales (Working note-2)	3,60,000	90,000	4,50,000
Cost of Goods Sold	14,40,000	7,20,000	21,60,000
Add: Selling expenses (Working note-3)	77,586	34,914	1,12,500
Cash Cost of Sales	15,17,586	7,54,914	22,72,500

2. Calculation of gross profit on Export Sales

Let domestic selling price is ₹ 100. Gross profit is ₹ 20, and then cost per unit is ₹ 80

Export price is 10% less than the domestic price i.e. ₹ 100 – (1-0.1) = ₹ 90

Now, gross profit will be = ₹ 90 - ₹ 80 = ₹ 10

So, Gross profit ratio at export price will be = $\frac{Rs.10}{Rs.90}$ x 100 = 11.11%

3. Apportionment of Selling expenses between Domestic and Exports sales:

Apportionment on the basis of sales value:

Domestic Sales = $\frac{Rs.1,12,500}{Rs.26,10,000}$ x ₹ 18,00,000 = ₹ 77,586

Exports Sales = $\frac{Rs.1,12,500}{Rs.26,10,000}$ x ₹ 8,10,000 = ₹ 34,914

4. Assumptions

(i) It is assumed that administrative expenses is related to production activities.

(ii) Value of opening and closing stocks are equal.

PROBLEM: 19

A supplier of X Ltd. offers the company 2/15 net 40 payment terms. To translate the shortened description of the payment terms, the supplier will allow a 2% discount if paid within 15 days, or a regular payment in 40 days. Determine the cost of credit related to these terms.

Solution:

Cost of credit can be calculated by using the following formula:

$\frac{d}{(100-d)} \times \left[\frac{365 \text{ days}}{t}\right]$

Where,

d = Size of discount or discount percentage (%)

t = Allowed payment days – discount days

$= \frac{2}{(100-2)} \times \left[\frac{365 \text{ days}}{40-15}\right]$

$= \frac{2}{98} \times \left[\frac{365 \text{ days}}{25}\right]$

= 0.0204 x 14.4 = 0.29376

i.e., 29.4%

The above formula does not take into account the compounding effect and. So, the cost of credit shall be even higher. The cost of lost cash discount can be estimated by the formula:

$\left[\frac{100}{100-t}\right]^{\frac{365}{t}} - 1$

CHAPTER 1 SCOPE & OBJECTIVES OF FINANCIAL MANAGEMENT

Multiple Choice Questions (MCQs)

1. Focus of financial management is mainly concerned with the decision related to:
   (a) Financing (b) Investing (c) Dividend (d) All of above

2. The main objective of financial management is to:
   (a) Secure profitability (b) Maximise shareholder wealth
   (c) Enhancing the cost of debt (d) None of above

3. The shareholder value maximisation model holds that the primary goal of the firm is to maximise its:
   (a) Accounting profit (b) Liquidity (c) Market value (d) Working capital

4. Wealth maximisation approach is based on the concept of:
   (a) Cost benefit analysis (b) Cash flow approach
   (c) Time value of money (d) All of the above

5. Management of all matters related to an organisation's finances is called:
   (a) Cash inflows and outflows (b) Allocation of resources
   (c) Financial management (d) Finance.

6. Which of the following is the disadvantage of having shareholders wealth maximisation goals?
   (a) Emphasizes the short-term gains
   (b) Ignores the timing of returns.
   (c) Requires immediate resources.
   (d) Offers no clear relationship between financial decisions and share price.

7. The most important goal of financial management is:
   (a) Profit maximization (b) Matching income and expenditure
   (c) Using business assets effectively (d) Wealth maximisation.

8. To achieve wealth maximization, the finance manager has to take careful decision in respect of:
   (a) Investment (b) Financing (c) Dividend (d) All the above.

9. Early in the history of finance, an important issue was:
   (a) Liquidity (b) Technology (c) Capital structure (d) Financing options.

10. Which of the following are microeconomic variables that help define and explain the discipline of finance?
    (a) Risk and return (b) Capital structure (c) Inflation (d) All of the above.

11. Financial Management is mainly concerned with the-

(a) Acquiring and developing assets to forfeit its overall benefit

(b) Acquiring, financing and managing assets to accomplish the overall goal of a business enterprise

(c) Efficient management of the business

(d) Sole objective of profit maximization

12. Which of the following need not be followed by the finance manager for measuring and maximising shareholders wealth?

(a) Accounting profit analysis (b) Cash Flow approach

(c) Cost benefit analysis (d) Application of time value of money

13. Which of the following is not a systematic risk?

(a) Market Risk (b) Business Risk

(c) Interest Rate Risk (d) Purchasing Power Risk

14. Deleted

15. Find the present value of ₹ 1000 receivable after 6 years hence if the rate of discount is 10%

(a) 558.39 (b) 546.78 (c) 534.64 (d) 564.47

16. Time value of money explains that

(a) A unit of money received today is worth more than a unit received in future

(b) A unit of money received today is worth less than a unit received in future

(c) A unit of money received today and at some other time in future is equal

(d) None of the above

17. Time value of money facilitates comparison if cash flows occurring at different time periods by

(a) Compounding all cash flows to a common point of time

(b) Discounting all cash flows to a common point of time

(c) Using either (a) or (b)

(d) Neither (a) nor (b)

18. If the nominal rate of interest is 10% p.a and frequency of compounding is 4 i.e quarterly compounding the effective rate of interest will be

(a) 10.25% p.a (b) 10.38% p.a. (c) 10% p.a (d) None of the above

19. Relationship between annual effective rate of interest and annual nominal rate of interest is, if frequency of compounding is more than 1

(a) Effective Rate < Nominal Rate (b) Effective Rate > Nominal Rate

(c) Effective Rate = Nominal Rate (d) None of the above

20. If annual effective rate of interest is 10.25 % per annum and nominal rate of return is 10% per annum what is the frequency of compounding

(a) 1 (b) 3 (c) 2 (d) 4

21. A student takes a loan of ₹ 50,000 from SBI. The rate of interest being charged by SBI is 10% per annum. What would be the amount of equal annual instalment if he wishes to pay it back in five instalments and first instalment, he will pay at the end of year 5?

(a) ₹11,000 (b) ₹19,310 (c) ₹15,000 (d) None of the above

22. How much amount should an investor invest now in order to receive five annuities starting from the end of this year of ₹10,000 if the rate of interest offered by bank is 10 % per annum?

(a) ₹40,000 (b) ₹45,000 (c) ₹37,910 (d) none of the above

23. Identify the correct statement

(a) Time value of money signifies that the value of a unit of money remains unchanged during different time periods.

(b) Time value of a unit of money is different over different periods on account of the reinvestment opportunities with the firms.

(c) Either compounding or discounting technique can be used, to make heterogeneous cash flows comparable.

(d) Effective and nominal rate of interest remain the same irrespective of the frequency of compounding.

24. Which of the following statement/(s) are correct:

i. Cash flows accruing to the firms at different time periods are directly comparable.

ii. Effective rate of interest is positively correlated with frequency of compounding.

iii. To arrive at the present value of cash flows, discounting is done at the rate which represents opportunity cost of funds.

(a) (i) only (b) (ii) and (iii) (c) (i), (ii) & (iii) (d) (i) & (iii)

Answers to the MCQs

1.	(d)	2.	(b)	3.	(c)	4.	(d)	5.	(c)	6.	(d)
7.	(d)	8.	(d)	9.	(a)	10.	(d)	11.	(b)	12.	(a)
13.	(b)	14.	-	15.	(d)	16.	(a)	17.	(c)	18.	(b)
19.	(b)	20.	(c)	21.	(b)	22.	(c)	23.	(b)	24.	(b)

CHAPTER 2 LEVERAGES

Multiple Choice Questions (MCQs)

1. Given

Operating fixed costs	₹ 20,000
Sales	₹ 1,00,000
P/ V ratio	40%

The operating leverage is:

(a) 2.00 (b) 2.50 (c) 2.67 (d) 2.47

2. If EBIT is ₹ 15,00,000, interest is ₹ 2,50,000, corporate tax is 40%, degree of financial leverage is;

(a) 1.11 (b) 1.20 (c) 1.31 (d) 1.41

3. If DOL is 1.24 and DFL is 1.99, DCL would be:

(a) 2.14 (b) 2.18 (c) 2.31 (d) 2.47

4. Operating Leverage is calculated as:

(a) Contribution ÷ EBIT (b) EBIT ÷ PBT

(c) EBIT ÷ Interest (d) EBIT ÷ Tax

5. Financial Leverage is calculated as:

(a) EBIT ÷ Contribution (b) EBIT ÷ PBT

(c) EBIT ÷ Sales (d) EBIT ÷ Variables Cost

6. Which of the following is correct?

(a) CL = OL + FL (b) CL = OL – FL

(c) CL = OL × FL (d) OL = OL ÷ FL

7. Which of the following indicates business risk?

(a) Operating leverage (b) Financial leverage

(c) Combined leverage (d) Total leverage

8. Degree of combined leverage is the fraction of:

(a) Percentage change in EBIT on Percentage change in Sales.

(b) Percentage change in EPS on Percentage change in Sales.

(c) Percentage change in Sales on Percentage change in EPS.

(d) Percentage change in EPS on Percentage change in EBIT.

9. From the following information, calculate combined leverage:

Sales	₹ 20,00,000
Variable Cost	40%
Fixed Cost	₹ 10,00,000
Borrowings	₹ 10,00,000 @ 8% p.a.

(a) 10 times (b) 6 times (c) 1.667 times (d) 0.10 times

10. Operating leverage is a function of which of the following factors?

(a) Amount of variable cost. (b) Variable contribution margin.

(c) Volume of purchases. (d) Amount of semi-variable cost.

11. Financial leverage may be defined as:

(a) Use of funds with a product cost in order to increase earnings per share.

(b) Use of funds with a contribution cost in order to increase earnings before interest and taxes.

(c) Use of funds with a fixed cost in order to increase earnings per share.

(d) Use of funds with a fixed cost in order to increase earnings before interest and taxes.

12. If Margin of Safety is 0.25 and there is 8% increase in output, then EBIT will be:

(a) Decrease by 2% (b) Increase by 32%

(c) Increase by 2% (d) Decrease by 32%

13. If degree of financial leverage is 3 and there is 15% increase in Earning per share (EPS), then EBIT will be:

(a) Decrease by 15% (b) Increase by 45% (c) Decrease by 45% (d) Increase by 5%

14. When EBIT is much higher than Financial break-even point, then degree of financial leverage will be slightly:

(a) Less than 1 (b) Equals to 1 (c) More than 1 (d) Equals to 0

15. Firm with high operating leverage will have:

(a) Higher breakeven point (b) Lower business risk

(c) Higher margin of safety (d) All of above

16. When sales are at breakeven point, the degree of operating leverage will be:

(a) Zero (b) Infinite (c) One (d) None of above

17. If degree of combined leverage is 3 and margin of safety is 0.50, then degree of financial leverage is:

(a) 6.00 (b) 3.00 (c) 0.50 (d) 1.50

18. Which of the following is incorrect with regards to Leverage?

(a) Leverage is an important technique in deciding the optimum capital structure of a firm.

(b) Leverage is also very helpful in taking a capital budgeting decision.

(c) Leverage is most important in assessing the risk involved in a market.

(d) None of the above

19. Match the following correct pairs with regards to financial leverage

Situation	Result
I. No fixed Financial Cost	A. Positive Financial Leverages
II. Higher Fixed Financial Cost	B. No Financial Leverages
III. When EBIT is higher than Financial Break-even Point	C. Negative Financial Leverages
IV. When EBIT is lesser than Financial Break-even point	D. Higher Financial Leverages

(a) I- C ; II- A ; III- D ; IV- B

(b) I- A; II- C ; III- B ; IV- D

(c) I- B ; II- D ; III- A ; IV- C

(d) I- D ; II- B ; III- C ; IV- A

20. Match the following correct pairs with regards to combined leverage

Situation	Result
I. No fixed cost and fixed Financial Cost	A. Higher Combined Leverages
II. Higher Fixed cost & fixed Financial Cost	B. Negative Combined Leverages
III. Sales Level higher than Break-even Point	C. No Combined Leverages
IV. When EBIT is lesser than Financial Break-even point	D. Positive Combined Leverages

(a) I- C ; II- A ; III- D ; IV- B

(b) I- A; II- C ; III- B ; IV- D

(c) I- B ; II- D ; III- A ; IV- C

(d) I- D ; II- B ; III- C ; IV- A

21. An analytical statement of Ash Ltd. is shown below: It is based on an output (Sales) level of 80,000 units;

Sales	9,60,000
Variable Cost	5,60,000
Revenue Before Fixed Costs	4,00,000
Fixed Costs	2,40,000
Earnings before Interest and Tax	1,60,000
Interest	60,000
Earnings Before Tax	1,00,000
Tax	35,000
Net Income	65,000

Calculate the degree of (i) Operating leverage, (ii) Financial leverage and (iii) The combined Leverage from the above data.

(a) 1.67 Times ; 2.67 Times ; 2.5 Times

(b) 1.60 Times ; 1.67 Times ; 6.15 Times

(c) 2.50 Times ; 1.60 Times ; 6.15 Times

(d) 2.50 Times ; 1.60 Times ; 4 Times.

22. Operating leverage helps in analysis of:

(a) Business Risk (b) Financing Risk (c) Production Risk (d) Credit Risk

23. Which of the following is studied with the help of financial leverage?

(a) Marketing Risk (b) Interest Rate Risk

(c) Foreign Exchange Risk (d) Financing risk

24. Combined Leverage is obtained from OL and FL by their:

(a) Addition (b) Subtraction (c) Multiplication (d) Any of these

25. High degree of financial leverage means:

(a) High debt proportion (b) Lower debt proportion

(c) Equal debt and equity (d) No debt

26. Operating leverage arises because of:

(a) Fixed Cost of Production (b) Fixed Interest Cost

(c) Variable Cost (d) Step Cost

27. Financial Leverage arises because of:

(a) Fixed cost of production (b) Variable Cost

(c) Interest Cost (d) Step Cost

28. Pick the incorrect statement

(a) Combined leverage helps in analysing the effect of change in sales level on the EPS of the firm.

(b) EBIT is also known as operating profits.

(c) If EBIT for two firms is same, then the EPS of these firms would also always be same.

(d) EPS depends upon the composition of capital structure

29. Which of the following statements is/are incorrect?

i. Financial breakeven level occurs when EBIT is zero.

ii. At financial breakeven level of EBIT, EPS would be zero.

iii. Indifference level of EBIT is one at which EPS is zero.

iv. Indifference level of EBIT is one at which EPS under two or more financial plans would be same.

v. All equity plan and Debt-equity plan have no indifference level of EBIT.

(a) (ii) and (iv) (b) (i), (ii) and (iv)

(c) (i), (iii) and (v) (d) All of the above

30. Which combination is generally good for firms

(a) High OL, High FL (b) Low OL, Low FL

(c) High OL, Low FL (d) Moderate OL. Moderate FL

31. Combined leverage can be used to measure the relationship between:

(a) EBIT and EPS (b) PAT and EPS (c) Sales and EPS (d) Sales and EBIT

32. FL is zero if:

(a) EBIT = Interest (b) IT = Zero

(c) EBIT = Fixed Cost (d) EBIT = Pref. Dividend

33. Business risk can be measured by:

(a) Financial leverage (b) Operating leverage

(c) Combined leverage (d) All of the above

34. Financial Leverage measures relationship between

(a) EBIT and PBT (b) EBIT and EPS (c) Sales and PBT (d) Sales and EPS

35. Use of Preference Share Capital in Capital structure

(a) Increases OL (b) Increases FL (c) Decreases OL (d) Decreases FL

36. Relationship between change in sales and change in EPS is measured by:

(a) Financial leverage (b) Combined leverage (c) Operating leverage (d) All of the above

37. Operating leverage works when:

(a) Sales Increases (b) Sales Decreases (c) Both (a) and (b) (d) None of (a) and (b)

38. Which of the following is correct?

(a) CL= OL + FL (b) CL=OL-FL (c) OL= OL × FL (d) OL=OL÷FL

39. If the fixed cost of production is zero, which one of the following is correct?

(a) OL is zero (b) FL is zero (c) CL is zero (d) None of the above

40. If a firm has no debt, which one is correct?

(a) OL is one (b) FL is one (c) OL is zero (d) FL is zero

41. If a company issues new share capital to redeem debentures, then:

(a) OL will increase (b) FL will increase (c) OL will decrease (d) FL will decrease

42. If a firm has a DOL of 2.8, it means:

(a) If sales increase by 2.8%, the EBIT will increase by 1%

(b) If EBIT increase by 2.896, the EPS will increase by 1 %

(c) If sales rise by 1%, EBIT will rise by 2.8%

(d) None of the above

43. Higher OL is related to the use of higher:

(a) Debt (b) Equity (c) Fixed Cost (d) Variable Cost

44. Higher FL is related the use of:

(a) Higher Equity (b) Higher Debt (c) Lower Debt (d) Lower Equity

45. In order to calculate EPS, Profit after Tax and Preference Dividend is divided by:

(a) MP of Equity Shares (b) Number of Equity Shares

(c) Face Value of Equity Shares (d) All of the above

46. The Degree of Operating Leverage (DOL) and the Degree of Financial Leverage (DFL) of ALANTA LTD. are 3 and 1.67 respectively. If the management of the company targets to increase the EPS by 10 %, by how much percentage should sales volume be increased? (Rounded off your answer to the nearest value.)

(a) 5% (b) 3.4% (c) 3% (d) 2%

47. The degree of operating leverage and degree of financial leverage of VINTEX LTD. are 2.00 and 1.5 respectively. What will be the percentage change in EPS, if the sale increases by 10%?

(a) 10% increase (b) 15% increase (c) 30% increase (d) 35% increase

48. Pick the correct statement

(a) Operating leverage analyses the relationship between sales level and EPS.

(b) Financial leverage depends upon the operating leverage.

(c) Dividend on preference shares is a factor of operating leverage.

(d) Financial leverage depends upon the fixed financial charges.

49. Pick the correct statement

(a) Favourable financial leverage and trading on equity are not same.

(b) Combined leverage establishes the relationship between operating leverage and financial leverage.

(c) Financial leverage is always beneficial to the firm

(d) Total risk of a firm is determined by the combined effect of operating and financial leverages.

50. Relationship between change in Sales and Operating Profit is known as:

(a) Financial Leverage (b) Operating Leverage

(c) Net Profit Ratio (d) Gross Profit Ratio.

51. If a firm has no Preference share capital, Financial Break even level is defined as equal to –

(a) EBIT (b) Interest liability (c) Equity Dividend (d) Tax Liability.

52. At Indifference level of EBIT, different capital have -

(a) Same EBIT (b) Same EPS (c)Same PAT (d) Same PBT

Answers to the MCQs

1.	(a)	2.	(b)	3.	(d)	4.	(a)	5.	(b)	6.	(c)
7.	(a)	8.	(b)	9.	(a)	10.	(b)	11.	(c)	12.	(b)
13.	(d)	14.	(c)	15.	(a)	16.	(b)	17.	(d)	18.	(c)
19.	(c)	20.	(a)	21.	(d)	22.	(a)	23.	(d)	24.	(c)
25.	(a)	26.	(a)	27.	(c)	28.	(c)	29.	(c)	30.	(c)
31.	(c)	32.	(b)	33.	(b)	34.	(b)	35.	(b)	36.	(b)
37.	(c)	38.	(c)	39.	(d)	40.	(b)	41.	(d)	42.	(c)
43.	(c)	44.	(b)	45.	(b)	46.	(d)	47.	(c)	48.	(d)
49.	(b)	50.	(b)	51.	(b)	52.	(b)				

CHAPTER 3 CAPITAL STRUCTURE

Multiple Choice Questions (MCQs)

1. The assumptions of MM hypothesis of capital structure do not include the following:
   (a) Capital markets are imperfect
   (b) Investors have homogeneous expectations
   (c) All firms can be classified into homogeneous risk classes
   (d) The dividend-payout ratio is cent percent, and there is no corporate tax

2. Which of the following is irrelevant for optimal capital structure?
   (a) Flexibility (b) Solvency (c) Liquidity (d) Control

3. Financial Structure refers to:
   (a) All financial resources (b) Short-term funds
   (c) Long-term funds (d) None of these

4. An EBIT-EPS indifference analysis chart is used for:
   (a) Evaluating the effects of business risk on EPS
   (b) Examining EPS results for alternative financial plans at varying EBIT levels
   (c) Determining the impact of a change in sales on EBIT
   (d) Showing the changes in EPS quality over time

5. The term "capital structure" means:
   (a) Long-term debt, preferred stock, and equity shares combination
   (b) Current assets and current liabilities combination
   (c) Net working capital
   (d) Shareholder's equity

6. The cost of monitoring management is considered to be a (an):
   (a) Bankruptcy cost (b) Transaction cost (c) Agency cost (d) Institutional cost

7. The traditional approach towards the valuation of a firm assumes:
   (a) That the overall capitalization rate changes in financial leverage.
   (b) That there is an optimum capital structure.
   (c) That the total risk is not changed with the changes in the capital structure.
   (d) That the markets are perfect.

8. Market values are often used in computing the weighted average cost of capital because:
   (a) This is the simplest way to do the calculation.
   (b) This is consistent with the goal of maximizing shareholder value.
   (c) This is required by SEBI.
   (d) This is a very common mistake.

9. A firm's optimal capital structure:
   (a) Is the debt-equity ratio that results in the minimum possible weighted average cost of capital
   (b) 40 percent debt and 60 percent equity
   (c) When the debt-equity ratio is 0.50
   (d) When Cost of equity is minimum

10. Capital structure of a firm influences the:
   (a) Risk (b) Return (c) Both Risk and Return (d) Return but not Risk

11. Consider the below mentioned statements:
   1. A company is considered to be over-capitalised when its actual capitalisation is lower than the proper capitalisation as warranted by the earning capacity.
   2. Both over-capitalisation and under-capitalisation are detrimental to the interests of the society.

   State True or False:
   (a) 1-True, 2-True (b) 1-False, 2-True
   (c) 1-False, 2-False (d) 1-True, 2-False

12. A critical assumption of the Net Operating Income (NOI) approach to valuation is:
   (a) That debt and equity levels remain unchanged.
   (b) That dividends increase at a constant rate.
   (c) That k_o remains constant regardless of changes in leverage.
   (d) That interest expense and taxes are included in the calculation.

13. Which of the following steps may be adopted to avoid the negative consequences of over-capitalisation?
   (a) The shares of the company should be split up. This will reduce dividend per share, though EPS shall remain unchanged.
   (b) Issue of Bonus Shares.
   (c) Revising upward the par value of shares in exchange of the existing shares held by them.
   (d) Reduction in claims of debenture-holders and creditors

14. Which of these is not a factor for considering capital structure?

(a) Cost (b) Control (c) Risk (d) None of the above

15. Rupa Ltd.'s EBIT is ₹ 5,00,000. The company has 10%, ₹ 20 lakh debentures. The equity capitalization rate (Ke) is 16%. Market Value of Equity and Cost of Capital

(a) ₹ 31,25,000 ; 9.76% (b) ₹ 38,75,000 ; 16%

(c) ₹ 18,75,000 ; 12.90% (d) ₹ 25,00,000 ; 20%

16. Which of these is not a general assumption in capital structure theories?

(a) The firm earns operating profits and it is not expected to grow

(b) There are no corporate or personal taxes

(c) There are three sources of funds equity, debt and preference shares

(d) The total assets of a firm and its Capital Employed are fixed

17. Alpha Ltd. has 50 per cent debt and 50 per cent equity. The borrowing rate is 8 per cent in a no-tax world, and capital markets are assumed to be perfect. If you own 2 per cent of the shares of Alpha Ltd., Calculate your return if the company has net operating income of ₹ 3,60,000 and the overall capitalization rate of the company (K_o) is 18 per cent.

(a) ₹ 7,200 (b) ₹ 5,600 (c) ₹ 6,480 (d) ₹ 5,500

18. Indra Ltd. has an EBIT of ₹ 1,00,000. The company makes use of both the debt and equity capital. The firm has 10% debentures of ₹ 5,00,000 and the firm's equity capitalization rate is 15%. Compute (i) total value of firm and (ii) Cost of Capital

(a) ₹ 3,33,333 ; 15% (b) ₹ 8,33,333 ; 12% (c) ₹ 1,00,000 ; 13% (d) ₹ 8, 33,333 ; 14%

19. Which of the following is not the consequences of Over Capitalisation :

(a) Considerable reduction in the rate of dividend and interest payments.

(b) Increase in the market price of shares.

(c) Resorting to "window dressing".

(d) Some companies may opt for reorganization.

20. Which of the following is not the effect of under capitalization:

(a) High profitability encourages new entrepreneurs to come into same type of business.

(b) High rate of dividend encourages the workers' union to demand high wages.

(c) Normally common people (consumers) start feeling that they are being exploited.

(d) None of the above

21. Which of the following statements is true?

(a) Preference dividend is not a factor of indifference level of EBIT.

(b) EBIT-EPS Analysis is an extension of financial leverage analysis.

(c) Trading on equity is resorted to with a view to decrease EPS.

(d) If the cost of capital of the firm (k) is higher than the rate of return (r), the firm will retain its earnings as it would lead to the reduction of its cost of capital

22. Trading on Equity is:

(a) Always beneficial (b) May be beneficial (c) Never beneficial (d) Sometimes beneficial.

23. Benefit of 'Trading on Equity' is available only if:

(a) Rate of Interest < Rate of Return (b) Rate of Interest > Rate of Return

(c) Both (a) and (b) (d) None of (d) and (b).

24. Indifference Level of EBIT is one at which:

(a) EPS is zero (b) EPS is Minimum (c) EPS is highest (d) None of these

25. Financial Break-even level of EBIT is one at which:

(a) EPS is one (b) EPS is zero (c) EPS is Infinite (d) EPS is Negative

26. Which of the following is not a relevant factor in EPS Analysis of capital structure?

(a) Rate of Interest on Debt (b) Tax Rate

(c) Amount of Preference Share Capital (d) Dividend paid last year

27. For a constant EBIT, if the debt level is further increased then

(a) EPS will always increase (b) EPS may increase

(c) EPS will never increase (d) None of the above

28. Financial break-even level of EBIT is:

(a) Intercept at Y-axis (b) Intercept at X-axis

(c) Slope of EBIT-EPS line (d) None of the above.

29. What is the value of a levered firm L Ltd. if it has the same EBIT as an unlevered firm U Ltd., (with value of 700 lakh), has a debt of ₹ 200 lakh, tax rate is 35 % under M-M approach?

(a) 770 lakh (b) 500 lakh (c) 630 lakh (d) 900 lakh

30. Net Income Approach to capital structure decision was proposed by _____

(a) J. E. Waller (b) M. H. Miller and D. Orr

(c) E. Solomon (d) D. Durand

31. The term optimal capital structure implies that the combination of external equity and internal equity at which _____

(a) The overall cost of capital is minimized

(b) The overall cost of capital is maximized

(c) The market value of firm is minimised

(d) The market value of firm is greater than the overall cost of capital

32. The term _____ means manipulation of accounts in a way so as to conceal vital facts and present the financial statements in a way to show a better position than what it actually is.

(a) Creative accounting (b) window accounting

(c) window dressing (d) modified accounting

Answers to the MCQs

1.	(a)	2.	(b)	3.	(a)	4.	(b)	5.	(a)	6.	(c)
7.	(b)	8.	(b)	9.	(a)	10.	(c)	11.	(b)	12.	(c)
13.	(d)	14.	(d)	15.	(c)	16.	(c)	17.	(b)	18.	(b)
19.	(b)	20.	(d)	21.	(b)	22.	(b)	23.	(a)	24.	(d)
25.	(b)	26.	(d)	27.	(b)	28.	(b)	29.	(a)	30.	(d)
31.	(a)	32.	(c)								

CHAPTER 4 COST OF CAPITAL

Multiple Choice Questions (MCQs)

1. Which of the following is not an assumption of the capital asset pricing model (CAPM)?
   (a) The capital market is efficient.
   (b) Investors lend or borrow at a risk-free rate of return.
   (c) Investors do not have the same expectations about the risk and return.
   (d) Investor's decisions are based on a single-time period.

2. Given: risk-free rate of return = 5 %; market return = 10%; cost of equity = 15%; value of beta (β) is:
   (a) 1.9 (b) 1.8 (c) 2.0 (d) 2.2

3. _____ may be defined as the cost of raising an additional rupee of capital:
   (a) Marginal cost of capital (b) Weighted Average cost of capital
   (c) Simple Average cost of capital (d) Liquid cost of capital

4. Which of the following cost of capital requires to adjust taxes?
   (a) Cost of Equity Share (b) Cost of Preference Shares,
   (c) Cost of Debentures (d) Cost of Retained Earnings

5. Marginal Cost of capital is the cost of:
   (a) Additional Revenue (b) Additional Funds
   (c) Additional Interests (d) None of the above

6. In order to calculate Weighted Average Cost of Capital, weights may be based on:
   (a) Market Values (b) Target Values
   (c) Book Values (d) Anyone of the above

7. Firm's Cost of Capital is the average cost of:
   (a) All long term sources of finance (b) All Borrowings
   (c) All share capital (d) All Bonds & Debentures

8. A company has a financial structure where equity is 70% of its total debt plus equity. Its cost of equity is 10% and gross loan interest is 5%. Corporation tax is paid at 30%. What is the company's weighted average cost of capital (WACC)?
   (a) 7.55% (b) 7.80% (c) 8.70% (d) 8.05%

9. The cost of equity capital is all of the following except:

   (a) The minimum rate that a firm should earn on the equity-financed part of an investment.

   (b) A return on the equity-financed portion of an investment that, at worst, leaves the market price of the stock unchanged.

   (c) By far, the most difficult component cost to estimate.

   (d) Generally, lower than the before-tax cost of debt.

10. What is the overall (weighted average) cost of capital when the firm has ₹ 20 crores in long-term debt, ₹ 4 crores in preferred stock, and ₹ 16 crores in equity shares? The before-tax cost for debt, preferred stock, and equity capital are 8%, 9%, and 15%, respectively. Assume a 50% tax rate.

    (a) 7.60% (b) 6.90% (c) 7.30% (d) 8.90%

11. Five years ago, Sona Limited issued 12 per cent irredeemable debentures at ₹ 103, at ₹ 3 premium to their par value of ₹ 100. The current market price of these debentures is ₹ 94. If the company pays corporate tax at a rate of 35 per cent CALCULATE its current cost of debenture capital?

    (a) 12.76% (b) 7.83% (c) 9.75% (d) 8.30%

12. A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2023 to be matured on 1.4.2028. The debentures will be redeemed on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

    (a) 1.42% (b) 4.28% (c) 4.5% (d) 4.95%

13. A company issued 10,000, 10% debentures of ₹ 100 each at par on 1.4.2018 to be matured on 1.4.2028. The company wants to know the cost of its existing debt on 1.4.2023 when the market price of the debentures is ₹ 80. COMPUTE the cost of existing debentures assuming 35% tax rate.

    (a) 11.67% (b) 10.5% (c) 10.20% (d) 15.55%

14. XYZ & Co. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. CALCULATE the cost of preference shares.

    (a) 10.53% (b) 10% (c) 9.5% (d) None of the above

15. If R Energy is issuing preferred stock at ₹100 per share, with a stated dividend of ₹12, and a floatation cost of 3% then, CALCULATE the cost of preference share?

    (a) 12% (b) 12.37% (c) 11.64% (d) 11%

16. XYZ Ltd. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. The company proposes to redeem the preference shares at the end of 10 th year from the date of issue. CALCULATE the cost of preference share?

    (a) 10.77% (b) 1.58% (c) 10.50% (d) 11.05%

17. A company has paid dividend of ₹ 1 per share (of face value of ₹ 10 each) last year and it is expected to grow @ 10% every year. CALCULATE the cost of equity if the market price of share is ₹ 55.

(a) 11.81% (b) 11.65% (c) 12% (d) None of the above

18. CALCULATE the cost of equity capital of H Ltd., whose risk-free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

(a) 17.5% (b) 23.75% (c) 18.75% (d) 15%

19. Face value of equity shares of a company is ₹ 10, while current market price is ₹ 200 per share. Company is going to start a new project, and is planning to finance it partially by new issue and partially by retained earnings. You are required to CALCULATE (i) cost of equity shares and (ii) cost of retained earnings if issue price will be ₹ 190 per share and floatation cost will be ₹ 5 per share. Dividend at the end of first year is expected to be ₹10 and growth rate will be 5%.

(a) 10%; 16.11% (b) 10.41%, 10.41% (c) 10%; 10.41% (d) 10%; 10.26%

20. Cost of equity of a company is 20%. Rate of floatation cost is 5%. Rate of personal income tax is 30%. Calculate cost of retained earnings.

(a) 20% (b) 14% (c) 19% (d) 13.3%

21. ABC Company provides the following details:
$D_0 = 4.19$ $P_0 = 50$ $g = 5\%$
CALCULATE the cost of retained earnings.

(a) 8.38% (b) 13.8% (c) 8.80% (d) 13.38%

22. Cost of equity of a company is 10.41% while cost of retained earnings is 10%. There are 50,000 equity shares of ₹10 each and retained earnings of ₹ 15,00,000. Market price per equity share is ₹ 50. Calculate WACC using market value weights if there are no other sources of finance.

(a) 10.10% (b) 10.41% (c) 10% (d) None of the above

23. Cost of capital refers to:

(a) Flotation Cost (b) Dividend

(c) Required Rate of Return (d) None of the above

24. Which of the following sources of funds has an implicit cost of capital?

(a) Equity Share Capital (b) Preference Share Capital

(c) Debentures (d) Retained earnings.

25. Which of the following has the highest cost of capital?

(a) Equity shares (b) Loans (c) Bonds (d) Preference shares.

26. Cost of capital for Government securities is also known as:

(a) Risk-free Rate of Interest (b) Maximum Rate of Return

(c) Rate of Interest on Fixed Deposits (d) None of the above.

27. Cost of capital for bonds and debentures is calculated on:

(a) Before Tax basis (b) After Tax basis

(c) Risk-free Rate of Interest basis (d) Compound interest

28. Weighted Average Cost of Capital (WACC) is generally denoted by:

(a) k_a (b) k_w (c) k_o (d) k_c

29. Which of the following cost of capital require tax adjustment?

(a) Cost of Equity Shares (b) Cost of Preference Shares

(c) Cost of Debentures (d) Cost of Retained Earnings

30. Which is the most expensive source of funds?

(a) New Equity Shares (b) New Preference Shares

(c) New Debts (d) Retained Earnings.

31. Marginal cost of capital is the cost of:

(a) Additional Sales (b) Additional Funds

(c) Additional Interests (d) Additional Revenue.

32. In case the firm is all-equity financed, the WACC would be equal to:

(a) Cost of Debt (b) Cost of Equity

(c) Neither (a) nor (b) (d) Both (a) and (b).

33. The beta coefficient of Target Ltd. is 1.4. The company has been maintaining 8 % rate of growth in dividends and earning. The last dividend paid was ₹ 4 per share. The return on government securities is 10 % while the return on market portfolio is 15 %. The current market price of one share of Target Ltd. is ₹ 36. What will be the equilibrium price per share of Target Ltd?

(a) 48 (b) 34 (c) 36 (d) 42

34. Security beta- 1.2 Risk free Rate- 4% Expected Market return- 12% calculate expected rate of return

(a) 14.6% (b) 12% (c) 13.6% (d) 9.6%

.

35. Firm's cost of capital is the average cost of:

(a) All sources (b) All borrowings

(c) Share capital (d) Share, Bonds and Debentures.

36. An implicit cost of increasing proportion of debt is:

(a) Tax should would not be available on new debt

(b) P/E Ratio would increase

(c) Equity shareholders would demand higher return

(d) Rate of Return of the company would decrease.

37. Cost of redeemable preference share capital is:

(a) Rate of Dividend

(b) After Tax Rate of Dividend

(c) Discount Rate that equates PV of inflows and out-flows relating to capital

(d) None of the above.

38. Which of the following is true?

(a) Retained earnings are cost free

(b) External Equity is cheaper than Internal Equity

(c) Retained Earnings are cheaper than External Equity

(d) Retained Earnings are costlier than External Equity.

39. Cost of capital may be defined as:

(a) Weighted average cost of all debts

(b) Rate of return expected by equity shareholders

(c) Average IRR of the Projects of the firm

(d) Minimum rate of return that the firm should earn.

40. Minimum rate of return that a firm must earn in order to satisfy its investors, is also known as:

(a) Average Return on Investment (b) Weighted Average Cost of Capital

(c) Net Profit Ratio (d) Average Cost of borrowing.

41. Cost of capital for equity share capital does not imply that:

(a) Market price is equal to book value of share

(b) Shareholders are ready to subscribe to right issue

(c) Market price is more than issue price

(d) All of the three above.

42. In order to calculate the proportion of equity financing used by the company, the following should be used:

(a) Authorised Share Capital

(b) Equity Share Capital plus Reserves and Surplus

(c) Equity Share Capital plus Preference Share Capital

(d) Equity Share Capital plus Long-term Debt.

43. The term capital structure denotes:

(a) Total of Liability side of Balance Sheet

(b) Equity Funds, Preference Capital and Long-term Debt

(c) Total Shareholders' Equity

(d) Types of Capital Issued by a Company.

44. Debt financing is a cheaper source of finance because of:

(a) Time Value of Money (b) Rate of Interest

(c) Tax-deductibility of Interest (d) Dividends not Payable to lenders

45. In order to find out cost of equity capital under CAPM, which of the following is not required:

(a) Beta Factor (b) Market Rate of Return

(c) Market Price of Equity Share (d) Risk-free Rate of Interest.

46. Tax-rate is relevant and important for calculation of specific cost of capital of:

(a) Equity Share Capital (b) Preference Share Capital

(c) Debentures (d) (a) and (b) both.

47. Advantage of debt financing is:

(a) Interest is tax-deductible (b) It reduces WACC

(c) It does not dilute owners' control (d) All of the above.

48. Cost of issuing new shares to the public is known as:

(a) Cost of Equity (b) Cost of Capital

(c) Flotation Cost (d) Marginal Cost of Capital.

49. Cost of equity share capital is more than cost of debt because:

(a) Face value of debentures is more than face value of shares

(b) Equity shares have higher risk than debt

(c) Equity shares are easily saleable

(d) All of the above.

50. Which of the following is not a generally accepted approach for calculation of cost of equity?

(a) CAPM
(b) Dividend Discount Model
(c) Rate of Preference Dividend Plus Risk Model
(d) Price-Earnings Ratio.

51. _____ is the basic debt instrument which may be issued by a borrowing company for a price which may be less than, equal to or more than the face value.

(a) A bond
(b) A debenture
(c) A bond or a debenture
(d) A bond and a debenture

52. Every debt instrument has ___.

(a) A face value
(b) A maturity value
(c) A face value as well as a maturity value
(d) Liquidity value

53. Which of the statements is true

(a) Cost of capital is cost of borrowing funds.
(b) Equity capital does not carry any cost as a company is under no legal obligation to pay dividends.
(c) Like equity capital, retained earnings also do not cause any cost to the company.
(d) Weighted average cost of capital takes into consideration cost of long-term sources of finance

54. Which of the following statements is true

i. Retained earnings do not have explicit cost. It carries implicit cost.
ii. Overall cost of capital decreases on payment of entire long-term debt.
iii. Cost of retained earnings is less then cost of equity.
iv. Beta is a measure of unsystematic risk.

(a) (i) and (iii)
(b) (i) and (ii)
(c) (ii), (iii) and (iv)
(d) None of the above

55. Which of the following statements is true

(a) Cost of additional equity share capital is the same as that of existing equity share capital.
(b) The higher is the corporate tax rate, the higher is the cost of debt.
(c) Beta is a measure of systematic risk.
(d) Cost of debt is higher than cost of equity.

56. Which of the following statements is false

(a) Cost of preference share capital is higher than cost of debt.
(b) Cost of preference share capital is higher than cost of equity share capital.
(c) Among all long-term sources of finance, equity capital carries maximum cost.
(d) The cost of capital is the required rate of return to certain the value of the firm.

57. Which of the following statements is/are false-

i. Different sources of funds have a specific cost of capital related to that source only.
ii. Cost of capital does not comprise any risk premium.
iii. Cost of capital is basic data for NPV technique.
iv. Risk free interest rate and cost of capital are same things.
v. Different sources have same cost of capital.

(a) (ii), (iv), (v) (b) Only (ii)

(c) (i), (ii), (iii), (v) (d) (i), (ii), (iii), (iv) & (v)

58. Which of the following statements is true.

(a) Tax liability of the firm is relevant for cost of capital of all the sources of funds.

(b) Cost of debt and Cost of Preference share capital, both, require tax adjustment.

(c) Every source of fund has an explicit cost of capital.

(d) WACC is the overall cost of capital of the firm.

59. Which of the following statements is true –

(a) WACC is always calculated with reference to book value of different sources of funds.

(b) Book value and Market Value weights are always different.

(c) Retained earnings have no market value, so these are not included in WACC (based on market value).

(d) Long-term sources of finance are used for a period of 5 to 10 years

60. BP Ltd. issued 60,000 12% Redeemable Preference Share of ₹100 each at a premium of ₹ 5 each, redeemable after 10 years at a premium of ₹ 10 each. The floatation cost of each share is ₹ 3. You are required to calculate cost of preference share capital ignoring dividend tax.

(a) 11.62% (b) 12.88% (c) 12.08% (d) 11.06%

61. The shares of ABC Ltd are currently selling for ₹100 on which the expected dividend is ₹4. Compute the total return on the shares if the earning or dividends are likely to grow at (i)5%, (ii)10%, (iii) 0%

(a) (i) 5%, (ii) 14%, (iii) 0% (b) (i) 9% (ii) 14% (iii) 4%

(c) (i) 9% (ii) 13% (iii) 5% (d) None of the above

62. A company is considering raising of funds of about ₹ 100 lakhs by one of two alternative methods, viz. 14% institutional term loan and 13 % non-convertible debentures. The term loan option would attract no major incidental cost. The debentures would have to be issued at a discount of 2.5 % and would involve cost of issue of ₹ 1 lakh. Calculate effective cost of the capital in each case. Assume a tax rate of 35%

(a) 14% ; 13% (b) 9.1% ; 8.45% (c) 9.1% ; 8.76% (d) 14% ; 8.45%

63. A company's share is quoted in market at 40 currently. A company pays a dividend of 2 per share and investors expect a growth rate of 10 % per year, compute:
    i. The company's cost of equity capital.
    ii. If anticipated growth rate is 11 % p.a. calculate the indicated market price per share.
    iii. If the company's cost of capital is 16% and anticipated growth rate is 10% p.a., calculate the market price if dividend of ₹ 2 per share is to be maintained.

    (a) 15.5% ; 49.33 ; 36.67 (b) 15.5% ; 40 ; 36.67
    (c) 16.55% ; 40.36 ; 44.4 (d) 16 % ; 40 ; 36.67

64. X Ltd. presently pays a dividend of ₹ 1.00 per share and has a share price of ₹ 20.00. If this dividend were expected to grow at a rate of 12% per annum forever, what is the firm's expected or required return on equity using a dividend-discount-model approach

    (a) 16.46% (b) 17.6% (c) 12% (d) 12.6%

65. A Ltd. has made an issue of debentures of ₹ 400 lakhs. Each debenture has a face value of ₹ 100 and carries a rate of interest of 14%. The interest is payable annually and the debenture is redeemable at a premium of 5% after 10 years. A Ltd. realises ₹ 97 per debenture and the corporate tax rate is 50%, what is the cost of debenture?

    (a) 10.89% (b) 14.65% (c) 7.72% (d) 12.86%

66. S Ltd.'s next expected dividend per share is 2.50, its growth rate is 6%, and the stock currently sells for 25 per share. Additional equity can be sold to public to net 21.00 per share.
    Calculate: i. S Ltd.'s floatation cost in
    ii. S Ltd.'s Floatation cost in %
    iii. S Ltd.'s cost of external equity

    (a) 4 ; 16% ; 16% (b) 21, 16% ; 17.90%
    (c) 4 ; 6.25% ; 16% (d) 4 ; 16% ; 17.90%

67. X Ltd. has 10% perpetual debt of 1,00,000. The tax rate is 35 %. Determine the cost of capital (before tax as well as after tax) assuming the debt is issued at 10% discount-

    (a) 11.11% ; 7.22% (b) 10% ; 6.5%
    (c) 9% ; 5.85% (d) 10.5% ; 6.85%

68. Five years ago, KPM Ltd issued 12% irredeemable debentures at 105, a 5% premium to their par value of 100. The current market price of these debentures is 95. If the company pays corporate tax at a rate of 35 % what is its current cost of debenture capital?

    (a) 7.8% (b) 8.21% (c) 7.42% (d) 12%

69. RR Ltd. issued 10,000, 12% convertible debentures of 100 each with a maturity period of 5 years. At maturity, the debenture holders will have the option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is 14 each and historically the growth rate of the shares is 5% per annum. Compute the cost of debentures assuming 35% tax rate.

(a) 12% (b) 16.89% (c) 15.29% (d) 11.67%

Answers to the MCQs

1.	(c)	2.	(c)	3.	(a)	4.	(c)	5.	(b)	6.	(d)
7.	(a)	8.	(d)	9.	(d)	10.	(d)	11.	(c)	12.	(b)
13.	(a)	14.	(a)	15.	(b)	16.	(a)	17.	(c)	18.	(c)
19.	(c)	20.	(d)	21.	(b)	22.	(a)	23.	(c)	24.	(d)
25.	(a)	26.	(a)	27.	(b)	28.	(c)	29.	(c)	30.	(a)
31.	(b)	32.	(b)	33.	(a)	34.	(c)	35.	(a)	36.	(c)
37.	(c)	38.	(c)	39.	(d)	40.	(b)	41.	(d)	42.	(b)
43.	(b)	44.	(c)	45.	(c)	46.	(c)	47.	(d)	48.	(c)
49.	(b)	50.	(c)	51.	(c)	52.	(c)	53.	(d)	54.	(a)
55.	(c)	56.	(b)	57.	(a)	58.	(d)	59.	(d)	60.	(c)
61.	(b)	62.	(c)	63.	(a)	64.	(b)	65.	(c)	66.	(d)
67.	(a)	68.	(b)	69.	(b)						

CHAPTER 5 FINANCIAL ANALYSIS & PLANNING RATIO ANALYSIS

Multiple Choice Questions (MCQs)

1. Ratio of Net sales to Net working capital is a:

   (a) Profitability ratio (b) Liquidity ratio

   (c) Current ratio (d) Working capital turnover ratio

2. Long-term solvency is indicated by:

   (a) Debt/equity ratio (b) Current Ratio (c) Operating ratio (d) Net profit ratio

3. Ratio of net profit before interest and tax to sales is:

   (a) Gross profit ratio (b) Net profit ratio

   (c) Operating profit ratio (d) Interest coverage ratio.

4. Observing changes in the financial variables across the years is:

   (a) Vertical analysis (b) Horizontal Analysis

   (c) Peer-firm Analysis (d) Industry Analysis.

5. The Receivable-Turnover ratio helps management to:

   (a) Managing resources (b) Managing inventory

   (c) Managing customer relationship (d) Managing working capital

6. Which of the following is a liquidity ratio?

   (a) Equity ratio (b) Proprietary ratio

   (c) Net Working Capital (d) Capital Gearing ratio

7. Which of the following is not a part of Quick Assets?

   (a) Disposable investments (b) Receivables

   (c) Cash and Cash equivalents (d) Prepaid expenses

8. Capital Gearing ratio is the fraction of:

   (a) Preference Share Capital and Debentures to Equity Share Capital and Reserve & Surplus.

   (b) Equity Share Capital and Reserve & Surplus to Preference Share Capital and Debentures.

   (c) Equity Share Capital to Total Assets.

   (d) Total Assets to Equity Share Capital.

9. From the following information, calculate P/E ratio:

Equity share capital of ₹ 10 each	₹ 8,00,000
9% Preference share capital of ₹ 10 each	₹ 3,00,000
Profit (after 35% tax)	₹ 2,67,000
Depreciation	₹ 67,000
Market price of equity share	₹ 48

(a) 15 times (b) 16 times (c) 17 times (d) 18 times

10. Equity multiplier allows the investor to see:

(a) What portion of interest on debt can be covered from earnings available to equity shareholders?

(b) How many times preference share interest be paid from earnings available to equity shareholders?

(c) What portion of return on equity is the result of debt?

(d) How many times equity is multiplied to get the value of debt?

11. A company has average accounts receivable of ₹ 10,00,000 and annual credit sales of ₹ 60,00,000. Its average collection period would be:

(a) 60.83 days (b) 6.00 days (c) 1.67 days (d) 0.67 days

12. A company has net profit margin of 5%, total assets of ₹ 90,00,000 and return on assets of 9%. Its total asset turnover ratio would be:

(a) 1.6 (b) 1.7 (c) 1.8 (d) 1.9

13. What does Q ratio measures?

(a) Relationship between market value and book value per equity share.

(b) Proportion of profit available per equity share.

(c) Overall earnings on average total assets.

(d) Market value of equity as well as debt in comparison to all assets at their replacement cost.

14. Calculate operating expenses from the information given below:

Sales	₹ 75,00,000
Rate of income tax	50%
Net profit to sales	5%
Cost of goods sold	₹ 32,90,000
Interest on debentures	₹ 60,000

(a) ₹ 41,00,000 (b) ₹ 8,10,000 (c) ₹ 34,00,000 (d) ₹ 33,90,000

15. Which of the following is not a profitability ratio?

(a) P/E ratio (b) Return on capital employed (ROCE)

(c) Q Ratio (d) Preference Dividend Coverage Ratio

16. Identify which of the following ratios is not used in general by the lenders:

(a) Coverage Ratios (b) Turnover ratios

(c) Solvency Ratios (d) Dividend Payout ratio

17. Profitability Ratio is generally not used by_____:

(a) Shareholders (b) Lenders (c) Investors (d) Creditors

18. Which of these ratios is not a ratio based on capital structure?

(a) Proprietary Ratio (b) Net Working Capital Ratio

(c) Debt to Equity Ratio (d) Capital Gearing Ratio

19. Which of the following is Liquidity Ratio

(a) Basic Defence / Interval Ratio (b) Working Capital Turnover Ratio

(c) Proprietary Ratio (d) Interest Coverage Ratio

20. What is the Debt Ratio?

(a) Total Outside LT Liabilities/ Shareholder's Equity

(b) Total Outside LT Liabilities/ Capital Employed

(c) Total Outside LT Liabilities/ Total Assets

(d) None of the above

21. In Inventory Turnover calculation, what is taken in the numerator?

(a) Sales (b) Cost of Goods Sold (c) Opening Stock (d) Closing Stock

22. The following is the Balance Sheet of Abhishek Ltd.

Liabilities	**₹**	**Assets**	**₹**
Issued Capital		Land and Building	1,50,000
2000 Equity Shares of ₹ 100 each	2,00,000	Plant and Machinery	80,000
Reserves	90,000	Stock-in-trade	1,49,000
Current Liabilities	1,30,000	Sundry Debtors	71,000
Profit and Loss A/c	60,000	Cash and Bank Balance	30,000
Total	**4,80,000**	**Total**	**4,80,000**

Find Current ratio.

(a) 2.92 (b) 1.38 (c) 0.78 (d) None of the above

23. XYZ Company's details are as under
Revenue: ₹ 29,261; Net Income: ₹ 4,212; Assets: ₹ 27,987; Shareholder's Equity: ₹ 13,572.
Calculate Return on Equity

(a) 0.1439 (b) 2.0621 (c) 0.3102 (d) 1.0455

24. Debtors Velocity 3 Months
Gross Profit Turnover Ratio 25%
Gross Profit ₹ 80,000
Bills Receivables ₹ 5,000
Calculate Sundry Debtors

(a) ₹ 3,20,000 (b) ₹ 80,000 (c) ₹ 75,000 (d) None of the above

25. Gross Profit ₹ 80,000
Gross Profit Turnover Ratio 25%
Stock Velocity- 8 Times
Closing stock of the year is ₹ 2,000 more than the opening stock
Calculate Closing Stock and opening stock

(a) ₹ 30,000 ; ₹ 32,000 (b) ₹ 31,000 ; ₹ 29,000

(c) ₹ 29,000 ; ₹ 31,000 (d) ₹ 30,000 ; ₹ 28,000

26. The following data has been abstracted from the annual accounts of a company-

	₹ in lakhs
Share Capital	
20000 equity shares of ₹10 each	200
General Reserves	150
Investments Allowance reserve	50
15% Long Term Loan	300
Profit before Tax	140
Provision for Tax	84
Proposed Dividends	10

Return on Capital Employed and Return on net worth ratios are:

(a) 46.25% ; 14% (b) 26.43% ; 14%

(c) 26.43% ; 35% (d) 46.25% ; 35%

27. Calculate the average collection period from the following details by adopting 360 days to a year:
Average inventory ₹ 3,60,000
Debtors ₹ 2,30,000
Inventory Turnover Ratio 6
Gross Profit Ratio 10%
Credit sales to total sales 20%

(a) 172.5 days (b) 191.67 days (c) 638.88 days (d) None of the above

28. The capital of A Ltd. is as follows:

10% Preference shares, ₹ 10 each	₹ 3,00,000
Equity shares of ₹ 10 each	₹ 8,00,000
Total	**₹ 11,00,000**

Additional information: Profit (after tax at 35%), ₹ 2,70,000; Depreciation, ₹ 60,000; Equity dividend paid 20%; Market price of equity shares, ₹ 50. You are required to compute the following, showing the necessary workings: (i) Dividend yield on the equity shares (ii) Cover for the preference and (iii) Cover for equity dividends

(a) 4%, 0.9%, 3%
(b) 4%, 9 Times, 1.52 Times
(c) 4 Times, 9 Times, 1.52 Times
(d) 4 times, 0.9%, 3%

29. Accounting Ratios are important tools used by –

(a) Managers (b) Researchers (c) Investors (d) All of the above

30. Net Profit Ratio Signifies:

(a) Operational Profitability
(b) Liquidity Position
(c) Big-term Solvency
(d) Profit for Lenders.

31. Working Capital Turnover measures, the relationship of Working Capital with:

(a) Fixed Assets (b) Sales (c) Purchases (d) Stock

32. In Ratio Analysis, the term Capital Employed refers to:

(a) Equity Share Capital
(b) Net worth + Long Term Debts
(c) Shareholders' Funds
(d) Current Assets

33. Dividend Pay-out Ratio is:

(a) EPS ÷ DPS
(b) DPS ÷ EPS
(c) Pref. Dividend ÷ PAT
(c) Pref. Dividend ÷ Equity Dividend

34. DuPont Analysis deals with:

(a) Analysis of Current Assets
(b) Analysis of Profit
(c) Capital Budgeting
(d) Analysis of Fixed Assets

35. In Net Profit Ratio, the denominator is:

(a) Net Purchases (b) Net Sales (c) Credit Sales (d) Cost of goods sold

36. Inventory Turnover measures the relationship of inventory with:

(a) Average Sales (b) Cost of Goods Sold (c) Total Purchases (d) Total Assets

37. The term 'EVA' is used for:

(a) Extra Value Analysis
(b) Economic Value Added
(c) Expected Value Analysis
(d) Engineering Value Analysis

38. Return on Investment may be improved by:

(a) Increasing Turnover (b) Reducing Expenses

(c) Increasing Capital Utilization (d) All of the above

39. In Current Ratio, Current Assets are compared with:

(a) Current Profit (b) Current Liabilities (c) Fixed Assets (d) Equity Share Capital

40. ABC Ltd. has a Current Ratio of 1.5: 1 and Net Current Assets of ₹ 7,50,000. What are the Current liabilities?

(a) ₹5,00,000 (b) ₹10,00,000 (c) ₹15,00,000 (d) ₹ 25,00,000

41. There is deterioration in the management of working capital of XYZ Ltd. What does it refer to?

(a) That the Capital Employed has reduced

(b) That the Profitability has gone up

(c) That debtors collection period has increased

(d) That Sales has decreased

42. Which of the following does not help to increase Current Ratio?

(a) Issue of Debentures to buy Stock

(b) Issue of Debentures to pay Creditors

(c) Sale of Investment to pay Creditors

(d) Avail Bank Overdraft to buy Machine

43. Debt to Total Assets Ratio can be improved by:

(a) Borrowing More (b) Issue of Debentures

(c) Issue of Equity Shares (d) Redemption of Debt.

44. Ratio of Net Income to Number of Equity Shares known as:

(a) Price Earnings Ratio (b) Net Profit Ratio

(c) Earnings per Share (d) Dividend per Share

45. Trend Analysis helps comparing performance of a firm –

(a) With other firms (b) Over a period of firm

(c) With other industries (d) With other companies

46. A Current Ratio of less than one means:

(a) Current Liabilities < Current Assets

(b) Fixed Assets > Current Assets

(c) Current Assets < Current Liabilities

(d) Share Capital > Current Assets.

47. A firm has Capital of ₹10,00,000; Sales of ₹5,00,000; Gross Profit of ₹2,00,000 and Expenses of ₹1,00,000. What is the Net Profit Ratio?

(a) 20% (b) 50% (c) 10% (d) 40%

48. XYZ Ltd. has earned 8% Return on Total Assests of ₹50,00,000 and has a Net Profit Ratio of 5%. Find out the Sales of the firm.

(a) ₹4,00,000 (b) ₹2,50,000 (c) ₹80,00,000 (d) ₹83,33,333

49. Suppliers and Creditors of a firm are interested in:

(a) Profitability Position (b) Liquidity Position

(c) Market Share Position (d) Debt Position

50. Which of the following is a measure of Debt Service capacity of a firm?

(a) Current Ratio (b) Acid Test Ratio

(c) Interest Coverage Ratio (d) Debtors Turnover

51. Gross Profit Ratio for a firm remains same but the Net Profit Ratio is decreasing. The reason for such behavior could be:

(a) Increase in Costs of Goods Sold (b) Increase in Expense

(c) Increase in Dividend (d) Decrease in Sales

52. Which of the following statements is correct?

(a) A Higher Receivable Turnover is not desirable

(b) Interest Coverage Ratio depends upon Tax Rate

(c) Increase in Net Profit Ratio means increase in Sales

(d) Lower Debt-Equity Ratio means lower Financial Risk

53. Ratio Analysis can be used to study liquidity, turnover, profitability, etc. of a firm. What does Debt-Equity Ratio help to study?

(a) Solvency (b) Liquidity (c) Profitability (d) Turnover

54. Which of the following helps analysing return to equity Shareholders?

(a) Return on Assets (b) Earnings Per Share

(c) Net Profit Ratio (d) Return on Investment

55. Return on Assets and Return on Investment Ratios belong to:

(a) Liquidity Ratios (b) Profitability Ratios (c) Solvency Ratios (d) Turnover

56. XYZ Ltd. has a Debt Equity Ratio of 1.5 as compared to 1.3 Industry average. It means that the firm has:

(a) Higher Liquidity (b) Higher Financial Risk

(c) Higher Profitability (d) Higher Capital Employed

Answers to the MCQs

1.	(d)	2.	(a)	3.	(c)	4.	(b)	5.	(d)	6.	(c)
7.	(d)	8.	(a)	9.	(b)	10.	(c)	11.	(a)	12.	(c)
13.	(d)	14.	(c)	15.	(d)	16.	(d)	17.	(d)	18.	(b)
19.	(a)	20.	(b)	21.	(b)	22.	(d)	23.	(c)	24.	(b)
25.	(b)	26.	(b)	27.	(a)	28.	(b)	29.	(d)	30.	(a)
31.	(a)	32.	(b)	33.	(b)	34.	(b)	35.	(b)	36.	(b)
37.	(b)	38.	(d)	39.	(b)	40.	(a)	41.	(c)	42.	(d)
43.	(d)	44.	(c)	45.	(b)	46.	(c)	47.	(a)	48.	(c)
49.	(b)	50.	(c)	51.	(b)	52.	(d)	53.	(a)	54.	(b)
55.	(b)	56.	(b)								

CHAPTER 6 TYPES OF FINANCING

Multiple Choice Questions (MCQs)

1. Equity shares:
   (a) Have an unlimited life, and voting rights and receive dividends
   (b) Have a limited life, with no voting rights but receive dividends
   (c) Have a limited life, and voting rights and receive dividends
   (d) Have an unlimited life, and voting rights but receive no dividends

2. External sources of finance do not include:
   (a) Debentures (b) Retained earnings (c) Overdrafts (d) Leasing

3. Internal sources of finance do not include:
   (a) Better management of working capital (b) Ordinary shares
   (c) Retained earnings (d) Reserve and Surplus

4. In preference shares:
   (a) Dividends are not available (b) Limited voting rights are available
   (c) Are not part of a company's share capital (d) Interest can be received

5. A debenture:
   (a) Is a long-term loan (b) Does not require security
   (c) Is a short-term loan (d) Receives dividend payments

6. Debt capital refers to:
   (a) Money raised through the sale of shares (b) Funds raised by borrowing that must be repaid.
   (c) Factoring accounts receivable. (d) Inventory loans.

7. The most popular source of short-term funding is:
   (a) Factoring. (b) Trade credit (c) Family and friends. (d) Commercial banks

8. Marketable securities are primarily:
   (a) short-term debt instruments. (b) short-term equity securities.
   (c) long-term debt instruments. (d) long-term equity securities.

9. Which of the following marketable securities is the obligation of a commercial bank?

(a) Commercial paper (b) Negotiable certificate of deposit

(c) Repurchase agreement (d) T-bills

10. Reserves & Surplus are which form of financing?

(a) Security Financing (b) Internal Financing

(c) Loans Financing (d) International Financing

11. With reference to ₹IFC Masala Bonds', which of the statements given below is/are correct?

1. The International Finance Corporation, which offered these bonds, is an arm of the World Bank.
2. They are rupee-denominated bonds and are a source of debt financing for the public and private sector.

(a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

12. External Commercial Borrowings can be accessed through .....

(a) only automatic route (b) only approval route

(c) both automatic and approval route (d) neither automatic nor approval route

13. Which of the following sources of funds has an implicit cost of capital?

(a) Equity Share Capital (b) Preference Share Capital

(c) Debentures (d) Retained earnings.

14. Which of the following has the highest cost of capital?

(a) Equity shares (b) Loans (c) Bonds (d) Preference shares.

15. Cost of capital for Government securities is also known as:

(a) Risk-free Rate of Interest (b) Maximum Rate of Return

(c) Rate of Interest on Fixed Deposits (d) None of the above.

16. Cost of capital for bonds and debentures is calculated on:

(a) Before Tax basis (b) After Tax basis

(c) Risk-free Rate of Interest basis (d) Compound interest

17. Which of the following cost of capital require tax adjustment?

(a) Cost of Equity Shares (b) Cost of Preference Shares

(c) Cost of Debentures (d) Cost of Retained Earnings.

18. Which is the most expensive source of funds?

(a) New Equity Shares
(b) New Preference Shares
(c) New Debts
(d) Retained Earnings.

19. Cost of redeemable preference share capital is:

(a) Rate of Dividend
(b) After Tax Rate of Dividend
(c) Discount Rate that equates PV of inflows and out-flows relating to capital
(d) None of the above.

20. Which of the following is true?

(a) Retained earnings are cost free
(b) External Equity is cheaper than Internal Equity
(c) Retained Earnings are cheaper than External Equity
(d) Retained Earnings are costlier than External Equity.

21. In order to calculate the proportion of equity financing used by the company, the following should be used:

(a) Authorised Share Capital
(b) Equity Share Capital plus Reserves and Surplus
(c) Equity Share Capital plus Preference Share Capital
(d) Equity Share Capital plus Long-term Debt.

22. Debt financing is a cheaper source of finance because of:

(a) Time Value of Money
(b) Rate of Interest
(c) Tax-deductibility of Interest
(d) Dividends not Payable to lenders

23. Tax-rate is relevant and important for calculation of specific cost of capital of:

(a) Equity Share Capital
(b) Preference Share Capital
(c) Debentures
(d) (a) and (b) both.

24. Advantage of debt financing is:

(a) Interest is tax-deductible
(b) It reduces WACC
(c) It does not dilute owners control
(d) All of the above.

25. Cost of issuing new shares to the public is known as:

(a) Cost of Equity
(b) Cost of Capital
(c) Flotation Cost
(d) Marginal Cost of Capital.

26. _____ is the basic debt instrument which may be issued by a borrowing company for a price which may be less than, equal to or more than the face value.

(a) A bond
(b) A debenture
(c) A bond or a debenture
(d) None of the above

27. Every debt instrument has _____.

(a) A face value
(b) A maturity value
(c) A face value as well as a maturity value
(d) Liquidity value

28. Which of these is the feature of Owners Capital or Equity Capital

(a) It is a source of permanent capital
(b) Equity shareholders are practically owners of the company
(c) Equity shareholders are entitiled to dividends after the income claims of other stakeholders are satisfied.
(d) All of the above

29. Following is the disadvantage of raising funds by issue of equity shares:

(a) It is a permanent source of finance
(b) A company is not obliged legally to pay dividends
(c) Equity capital increases the company's financial base
(d) The issue of new equity shares can also reduce the ownership and control of existing shareholders.

30. What is the salient feature of Foreign currency Convertible Bond (FCCB)

(a) The bonds comes at very low rate of interest
(b) The advantage to the issuer is that the issuer can get foreign currency at a very low cost.
(c) The risk is that in case the bond has to be redeemed on the date of maturity, the issuer has to make the payment and at that time the issuer may not have the money.
(d) All of the above

31. Methods of Venture Capital Financing does not include:

(a) Equity Financing
(b) Conditional Loan
(c) Income note
(d) Convertible debentures

32. Which of these are Short Term sources of finance

i. Trade Credit

ii. Advances from customers

iii. Accrued Expenses and Deferred Income

iv. Certificate of deposits

(a) (i) and (ii) only (b) (i) (ii) and (iii)

(c) (i) (ii) (iii) and (iv) (d) (iii) and (iv) only

33. Which of these is not a contemporary source of finance

(a) Crowd Funding (b) Commercial Paper

(c) Equity Funding (d) Peer-to- Peer (P2P) Lending

34. Which of these is the source of international financing

(a) Option Bonds (b) Inflation Bonds

(c) Discounting of Trade Bills (d) Inter Corporate Deposits

35. Which of the following is not the main characteristics of operating lease?

(a) The lease is for a longer period

(b) The lessor has the option to lease out the asset again to another party

(c) The lease can be cancelled by the lessee prior to its expiration at a short notice

(d) The lessor is responsible for the upkeep and maintenance of the asset

36. _____ leases are popular in structuring leases of very expensive assets such as the lease of a plane or a ship.

(a) Sales and lease back (b) Leveraged Lease

(c) Close-ended and open-ended leases (d) Sales-aid lease

37. Match the following

Types of Debentures	**Salient Features**
I. Bearer	A. Secured by a charge of Asset(s)
II. Registered	B. Unsecured
III. Naked or simple	C. Transferable like Negotiable Instruments
IV. Mortgage	D. Interest Payable to registered person

(a) I-(B), II-(A), III-(C), IV-(D) (b) I-(C), II-(D), III-(B), IV-(A)

(c) I-(A), II-(C), III-(D), IV-(B) (d) I-(D), II-(C), III-(B), IV-(A)

38. Pick the incorrect statement;

(a) Preference shares enables the company to avoid dilution of equity capital

(b) Dividend being an appropriation of profits is not deductible, while computing taxable profits of business

(c) Shareholders are entitled for dividends which depends upon liquidity position of the company

(d) Equity shares are redeemed only in case of liquidation, hence high risk is involved

39. Which of the following statements is **correct** with respect to equity share capital

(a) Equity shares are high risky but less costly, in the capital employed by the company

(b) The company cannot make further issue of share capital

(c) The company can issue bonus shares by way of capitalisation of reserves

(d) As per recent amendment to the Companies Act, non voting equity shares cannot be issued as per SEBI Guidelines

40. The following statement(s) are true with respect to preference share capital

i. The rate of dividend on preference shares is normally higher than the rate of interest on debentures, loans etc.

ii. Most of preference shares these days carry a stipulation of period and the funds have to be repaid at the end of a stipulated period.

iii. Long-term funds from preference shares can be raised through a public issue of shares

(a) All of the above (b) None of the above

(c) Only (i) (d) Only (ii) and (iii)

41. Following are the salient features of the Debentures or bonds except:

(a) The period of maturity normally varies from 3 to 10 years and may also increase for projects having high gestation period.

(b) Debentures are either secured or unsecured.

(c) They cannot be listed on the stock exchange.

(d) Normally, debentures are issued on the basis of a debenture trust deed which lists the terms and conditions on which the debentures are floated.

42. _____ refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions.

(a) Equity Financing (b) Conditional Loan

(c) Bridge Financing (d) None of the above

43. Which of the following bonds are Project based bonds:

i. Green Bonds
ii. Social Bonds
iii. Sustainability-linked bonds

(a) Only (i) and (iii)
(b) Only (iii)
(c) Only (i) and (ii)
(d) All of the above

44. The concept of the depository receipt mechanism which is used to raise funds in foreign currency has been applied in the Indian Capital Market through_____

(a) American Depository Receipts (ADRs)
(b) Global Depository Receipts (GDRs)
(c) Indian Depository Receipts (IDRs)
(d) None of the above

45. Which of the following statements are true

(I) Long-term sources of finance are used for a period of 5 to 10 years.
(II) Medium term sources of finance are needed for a period of 1 to 5 years
(III) Short-term financing means financing for a period of less than 1 year.

(a) Only III
(b) I and III
(c) Only I
(d) I, II & III

46. Which of following statements false

(a) The preference shares carry limited voting right though they are a part of the capital.
(b) Lease is a contract between the owner of asset and the user of the asset.
(c) As compared to operating lease, a financial lease is for a shorter period of time.
(d) Factoring and discounting are not same.

47. Pick the incorrect statement

(a) ADR means any instrument in the form of a depository receipt or certificate created by the RBI.
(b) Crowdfunding is a great alternative way to fund a venture.
(c) Crowdfunding is a collaborative funding model that lets you collect small contributions from many individuals.
(d) The cost of capital is an integral part of investment decisions as it is used to measure the worth of investment proposal.

Answers to the MCQs

1.	(a)	2.	(b)	3.	(b)	4.	(b)	5.	(a)	6.	(b)
7.	(b)	8.	(a)	9.	(b)	10.	(b)	11.	(c)	12.	(c)
13.	(d)	14.	(a)	15.	(a)	16.	(b)	17.	(c)	18.	(a)
19.	(c)	20.	(c)	21.	(b)	22.	(c)	23.	(c)	24.	(d)
25.	(c)	26.	(c)	27.	(c)	28.	(d)	29.	(d)	30.	(d)
31.	(d)	32.	(c)	33.	(b)	34.	(c)	35.	(a)	36.	(b)
37.	(b)	38.	(d)	39.	(c)	40.	(a)	41.	(d)	42.	(c)
43.	(c)	44.	(c)	45.	(d)	46.	(c)	47.	(a)		

CHAPTER 7 INVESTMENT DECISIONS

Multiple Choice Questions (MCQs)

1. A capital budgeting technique which does not require the computation of cost of capital for decision making purposes is:

   (a) Net Present Value method
   (b) Internal Rate of Return method
   (c) Modified Internal Rate of Return method
   (d) Payback Period method

2. If two alternative proposals are such that the acceptance of one shall exclude the possibility of the acceptance of another then such decision making will lead to:

   (a) Mutually exclusive decisions
   (b) Accept reject decisions
   (c) Contingent decisions
   (d) None of the above

3. In case a company considers a discounting factor higher than the cost of capital for arriving at present values, the present values of cash inflows will be:

   (a) Less than those computed on the basis of cost of capital
   (b) More than those computed on the basis of cost of capital
   (c) Equal to those computed on the basis of the cost of capital
   (d) None of the above

4. If the cut off rate of a project is greater than IRR, we may:

   (a) Accept the proposal
   (b) Reject the proposal
   (c) Be neutral about it
   (d) Wait for the IRR to increase and match the cut off rate

5. While evaluating capital investment proposals, time value of money is used in which of the following techniques:

   (a) Payback Period method
   (b) Accounting rate of return
   (c) Net present value
   (d) None of the above

6. IRR would favour project proposals which have:

   (a) Heavy cash inflows in the early stages of the project.
   (b) Evenly distributed cash inflows throughout the project.
   (c) Heavy cash inflows at the later stages of the project.
   (d) None of the above

7. The re-investment assumption in the case of the IRR technique assumes that:
   (a) Cash flows can be re-invested at the projects IRR.
   (b) Cash flows can be re-invested at the weighted cost of capital.
   (c) Cash flows can be re-invested at the marginal cost of capital.
   (d) None of the above

8. Multiple IRRs are obtained when:
   (a) Cash flows in the early stages of the project exceed cash flows during the later stages.
   (b) Cash flows reverse their signs during the project.
   (c) Cash flows are uneven.
   (d) None of the above.

9. Depreciation is included as a cost in which of the following techniques:
   (a) Accounting rate of return (b) Net present value
   (c) Internal rate of return (d) None of the above

10. The gensis of financial risk lies in
   (a) Capital budgeting decision (b) capital structure decision
   (c) dividend decision (d) liquidity decision

11. Assume cash outflow equals ₹ 1,20,000 followed by cash inflows of ₹ 25,000 per year for 8 years and a cost of capital of 11%. What is the Net present value?
   (a) (₹ 38,214) (b) ₹ 9,653 (c) ₹ 8,653 (d) ₹ 38,214

12. What is the Internal rate of return for a project having cash flows of ₹ 40,000 per year for 10 years and a cost of ₹ 2,26,009?
   (a) 8% (b) 9% (c) 10% (d) 12%

13. While evaluating investments, the release of working capital at the end of the project's life should be considered as:
   (a) Cash inflow (b) Cash outflow
   (c) Having no effect upon the capital budgeting decision (d) None of the above

14. Capital rationing refers to a situation where:
   (a) Funds are restricted and the management has to choose from amongst available alternative investments.
   (b) Funds are unlimited and the management has to decide how to allocate them to suitable projects.
   (c) Very few feasible investment proposals are available with the management.
   (d) None of the above.

15. Capital budgeting is done for:

(a) Evaluating short term investment decisions.

(b) Evaluating medium term investment decisions.

(c) Evaluating long term investment decisions.

(d) None of the above.

16. Mr X is considering a proposal to buy a machine for ₹ 30,000. The expected cash flows after taxes from the machine for the period of 3 consecutive years are ₹ 20,000 each. After the expiry of the useful life of the machine the seller has guaranteed its repurchase at ₹2,000. The firm's cost of capital is 10% and the risk adjusted discount rate is 18%. Calculate the NPV of the proposal.

(a) ₹44,982 (b) ₹14,982 (c) ₹ 14,702 (d) ₹21,240

17. Deleted

18. Capital Budgeting is a part of:

(a) Investment Decision (b) Working Capital Management

(c) Marketing Management (d) Capital Structure.

19. Capital Budgeting deals with:

(a) Long-term Decisions (b) Short-term Decisions

(c) Both (a) and (b) (d) Neither (a) nor (b)

20. Which of the following is not used in Capital Budgeting?

(a) Time Value of Money (b) Sensitivity Analysis

(c) Net Assets Method (d) Cash Flows.

21. Capital Budgeting Decisions are:

(a) Reversible (b) Irreversible (c) Unimportant (d) All of the above

22. Which of the following is not incorporated in Capital Budgeting?

(a) Tax-Effect (b) Time Value of Money (c) Required Rate of Return (d) Rate of Cash Discount

23. Which of the following is not a capital budgeting decision?

(a) Expansion Programme (b) Merger

(c) Replacement of an Asset (d) Inventory Level

24. A sound Capital Budgeting technique is based on:

(a) Cash Flows
(b) Accounting Profit
(c) Interest Rate on Borrowings
(d) Last Dividend Paid

25. Which of the following is not a relevant cost in Capital Budgeting?
(a) Sunk Cost
(b) Opportunity Cost
(c) Allocated Overheads
(d) Both (a) and (c) above

26. Capital Budgeting Decisions are based on:
(a) Incremental Profit
(b) Incremental Cash Flows
(c) Incremental Assets
(d) Incremental Capital

27. Which of the following does not affect cash flows proposal?
(a) Salvage Value
(b) Depreciation Amount
(c) Tax Rate Change
(d) Method of Project Financing

28. Cash Inflows from a project include:
(a) Tax Shield of Depreciation
(b) After-tax Operating Profits
(c) Raising of Funds
(d) Both (a) and (b)

29. Which of the following is not true with reference capital budgeting?
(a) Capital budgeting is related to asset replacement decisions
(b) Cost of capital is equal to minimum required return
(c) Existing investment in a project is not treated as sunk cost
(d) Timing of cash flows is relevant.

30. Which of the following is not followed in capital budgeting?
(a) Cash flows Principle
(b) Interest Exclusion Principle
(c) Accrual Principle
(d) Post-tax Principle

31. Depreciation is incorporated in cash flows because it:
(a) Is unavoidable cost
(b) Is a cash flow
(c) Reduces Tax liability
(d) Involves an outflow

32. Which of the following is not true for capital budgeting?
(a) Sunk costs are ignored
(b) Opportunity costs are excluded
(c) Incremental cash flows are considered
(d) Relevant cash flows are considered

33. Which of the following is not applied in capital budgeting?

(a) Cash flows be calculated in incremental terms

(b) All costs and benefits are measured on cash basis

(c) All accrued costs and revenues be incorporated

(d) All benefits are measured on after-tax basis

34. Evaluation of Capital Budgeting proposals is based on Cash Flows because:

(a) Cash Flows are easy to calculate (b) Cash Flows are suggested by SEBI

(c) Cash is more important than profit (d) Cash Flows are suggested by RBI

35. Which of the following is not included in incremental cashflows?

(a) Opportunity Costs (b) Sunk Costs

(c) Change in Working Capital (d) Inflation effect

36. A proposal is not a Capital Budgeting proposal if it:

(a) is related to Fixed Assets (b) brings long-term benefits

(c) brings short-term benefits only (d) has very large investment

37. In Capital Budgeting, Sunk cost is excluded because it is:

(a) of small amount (b) not incremental (c) not reversible (d) All of the above

38. Savings in respect of a cost is treated in capital budgeting as:

(a) An Inflow (b) An Outflow (c) Opening balance (d) Closing balance

39. _____ ignores the time value of money.

(a) IRR (b) ARR (c) NPV (d) PI

40. The discounted cash flows techniques are:

(a) Net Present Value (NPV) (b) Internal Rate of Return (IRR)

(c) Profitability Index (PI) (d) All of the above

41. If the NPV is positive or at least equal to zero, the project can be __.

(a) break even situation (b) accepted or rejected (c) rejected (d) accepted

42. The following information is given for a project: Annual cash inflow ₹ 8,00,000
Useful life 4 years

Payback period 2.855 years

The cost of the project would be –

(a) ₹ 22,80,000 (b) ₹ 22,84,000

(b) ₹ 22,86,000 (d) ₹ 22,87,800.

43. Initial investment ₹ 20 Lakh. Expected annual cash flows ₹ 6 Lakh for 10 years. Cost of capital @15%. Profitability Index (PI) is -
(Cumulative discounting factor @ 15% for 10 years = 5.019)

(a) 1.51 (b) 1.71 (c) 2.51 (d) 2.91

44. Annual Cost Saving ₹ 4,00,000; Useful life 4 years; Cost of the Project ₹ 11,42,000. The Payback period would be –

(a) 2 years 8 months (b) 2 years 11 months

(c) 3 years 2 months (d) 3 year 10 months

45. A project has a 10% discounted payback of 2 years with annual after-tax cash inflows commencing from year end 2 to 4 of ₹ 400 lakh. How much would have been the initial cash outlay which was fully made at the beginning of year 1?

(a) ₹ 400 lakh (b) ₹ 422 lakh (c) ₹ 452 lakh (d) ₹ 497.20 lakh

46. Between two capital plans, if expected EBIT is more than indifference level of EBIT, then

(a) Both plans be rejected (b) Both plans are good

(c) One is better than other (d) Both plans are break-even

47. Which of the following variables is not known in Internal Rate of Return?

(a) Initial Cash Flows (b) Discount Rate (c) Terminal Inflows (d) Life of the Project

48. Capital Budgeting Techniques which considers the time value of money is based on:

(a) Cash flows of the organisation (b) Accounting Profit of the organisation

(c) Interest Rate on Borrowings (d) Last dividend paid

49. In a single projects situation, results of Internal Rate of return and net present value lead to

(a) Cashflow decision (b) cost decision (c) same decisions (d) different decisions

Answers to the MCQs

1.	(d)	2.	(a)	3.	(a)	4.	(b)	5.	(c)	6.	(a)
7.	(a)	8.	(b)	9.	(a)	10.	(b)	11.	(c)	12.	(d)
13.	(a)	14.	(a)	15.	(c)	16.	(b)	17.	-	18.	(a)
19.	(a)	20.	(c)	21.	(b)	22.	(d)	23.	(d)	24.	(a)
25.	(d)	26.	(b)	27.	(d)	28.	(d)	29.	(c)	30.	(c)
31.	(c)	32.	(b)	33.	(c)	34.	(c)	35.	(b)	36.	(c)
37.	(b)	38.	(a)	39.	(b)	40.	(d)	41.	(d)	42.	(b)
43.	(a)	44.	(b)	45.	(c)	46.	(c)	47.	(b)	48.	(a)
49.	(c)										

CHAPTER 8 DIVIDEND DECISIONS

Multiple Choice Questions (MCQs)

1. Which one of the following is the assumption of Gordon's Model:
   (a) Ke > g
   (b) Retention ratio, (b), once decide upon, is constant
   (c) Firm is an all equity firm
   (d) All of the above

2. What should be the optimum Dividend pay-out ratio, when r = 15% & Ke = 12%:
   (a) 100% (b) 50% (c) Zero (d) None of the above.

3. Which of the following is the irrelevance theory?
   (a) Walter model (b) Gordon model (c) M.M. hypothesis (d) Linter's model

4. If the company's D/P ratio is 60% & ROI is 16%, what should be the growth rate?
   (a) 5% (b) 7% (c) 6.4% (d) 9.6%

5. If the shareholders prefer regular income, how does this affect the dividend decision:
   (a) It will lead to payment of dividend (b) It is the indicator to retain more earnings
   (c) It has no impact on dividend decision (d) Can't say

6. Mature companies having few investment opportunities will show high payout ratios, this statement is:
   (a) False (b) True (c) Partial true (d) None of these

7. Which of the following is the limitation of Linter's model?
   (a) This model does not offer a market price for the shares.
   (b) The adjustment factor is an arbitrary number and not based on any scientific criterion or methods.
   (c) Both (a) & (b)
   (d) None of the above.

8. What are the different options other than cash used for distributing profits to shareholders?
   (a) Bonus shares (b) Stock split (c) Both (a) and (b) (d) None of the above

9. Which of the following statement is correct with respect to Gordon's model?

   (a) When IRR is greater than cost of capital, the price per share increases and dividend pay-out decreases.

   (b) When IRR is greater than cost of capital, the price per share decreases and dividend pay-out increases.

   (c) When IRR is equal to cost of capital, the price per share increases and dividend pay-out decreases.

   (d) When IRR is lower than cost of capital, the price per share increases and dividend pay-out decreases.

10. Compute EPS according to Graham & Dodd approach from the given information:

Market price	₹ 56
Dividend pay-out ratio	60%
Multiplier	2

(a) 30 (b) 56 (c) 28 (d) 84

11. Which among the following is not an assumption of Walter's Model?

   (a) Rate of return and cost of capital are constant

   (b) Information is freely available to all

   (c) There is discrimination in taxes

   (d) The firm has perpetual life

12. Dividends distributed in the form of a promissory note to pay the shareholders later are called ____ Dividend

   (a) Property Dividend (b) Liquidating Dividend (c) Scrip Dividend (d) Cash Dividend

13. X Ltd. earns 6 per share having capitalisation rate @10% and has a return on investment at the rate of 20%. According to Walter's Model, what should be the price per share at 30% dividend payout ratio?

   (a) 300 (b) 102 (c) 120 (d) None of the above

14. Which of the statements is incorrect regards to stock dividends-

   (a) It preserves the company's liquidity as no cash is used.

   (b) The shareholders can liquidate these shares whenever they require.

   (c) It is inexpensive method of raising the capital by which the cash resources of the company are conserved.

   (d) It is perceived as an indication by the market that the company financial position is not sound.

15. The shareholders' funds of XYZ Ltd for the year ending March 31 are as follows:

(₹)

12% Preference share capital	1,00,000
Equity share capital (Rs 100 each)	4,00,000
Share premium	40,000
Retained earnings	3,00,000
	8,40,000

The earnings available for equity shareholders from this period's operations is 1,50,000, which have been included as part of the 3,00,000 retained earnings. What is the maximum dividend per share (DPS) the firm can pay?

(a) 72 (b) 37.5 (c) 75 (d) 85

16. Which of the following is incorrect about stock dividend?

(a) Stock dividends are costlier to administer than cash dividends.

(b) No tax is payable by shareholders on stock dividend received from domestic company.

(c) It helps company in Conservation of cash for meeting profitable investment opportunities.

(d) None of the above

17. If the financing requirements are to be executed through debt then it would be preferable to _____ dividend.

(a) Retain more (b) distribute more (c) Not to distribute at all (d) Distribute 2%

18. The shares of ABC Ltd are currently selling for ₹100 on which the expected dividend is ₹4. Compute the total return of the shares if the earning or dividends are likely to grow at (i)5%, (ii)10%, (iii) 0%

(a) (i)5%, (ii)10%, (iii) 0% (b) (i)9% (ii)14% (iii)4%

(c) (i) 11% (ii) 13% (iii) 5% (d) None of the above

19. Which of the statements is false?

i) M-M theory of irrelevance of dividends is applicable only to firms which have a constant investment policy.
ii) According to M-M theory, the market price of the share will remain unchanged even after the payment of dividends.
iii) The term dividend refers to that portion of profit (after tax) or earnings or retained earnings which is distributed among the owners/shareholders of the firm.

(a) Only (i) (b) (i) and (ii) (c) (ii) and (iii) (d) None of the above

20. The “Dividend-Payout Ratio” is equal to

(a) The dividend yield plus the capital gains yield

(b) Dividends per share divided by earnings per equity share

(c) Dividends per share divided by par value per share

(d) Dividends per share divided by current price per share

Answers to the MCQs

1.	(d)	2.	(c)	3.	(c)	4.	(c)	5.	(a)	6.	(b)
7.	(c)	8.	(a)	9.	(a)	10.	(a)	11.	(c)	12.	(c)
13.	(b)	14.	(d)	15.	(c)	16.	(d)	17.	(b)	18.	(b)
19.	(d)	20.	(b)								

CHAPTER 9 MANAGEMENT OF WORKING CAPITAL

Multiple Choice Questions (MCQs)

1. The credit terms may be expressed as "3/15 net 60". This means that a 3% discount will be granted if the customer pays within 15 days, if he does not avail the offer, he must make payment within 60 days.

   (a) I agree with the statement
   (b) I do not agree with the statement
   (c) I cannot say.
   (d) None of the Above

2. The term 'net 50' implies that the customer will make payment:

   (a) Exactly on 50th day
   (b) Before 50th day
   (c) Not later than 50th day
   (d) None of the above.

3. Trade credit is a source of:

   (a) Long-term finance
   (b) Medium term finance
   (c) Spontaneous source of finance
   (d) None of the above.

4. The term float is used in:

   (a) Inventory Management
   (b) Receivable Management
   (c) Cash Management
   (d) Marketable securities.

5. William J Baumol's model of Cash Management determines optimum cash level where the carrying cost and transaction cost are:

   (a) Maximum (b) Minimum (c) Medium (d) None of the above.

6. In Miller – ORR Model of Cash Management:

   (a) The lower, upper limit, and return point of Cash Balances are set out
   (b) Only upper limit and return point are decided
   (c) Only lower limit and return point are decided
   (d) None of the above are decided.

7. Working Capital is defined as:

   (a) Excess of current assets over current liabilities
   (b) Excess of current liabilities over current assets
   (c) Excess of Fixed Assets over long-term liabilities
   (d) None of the above

8. Working Capital is also known as "Circulating Capital, fluctuating Capital and revolving capital". The aforesaid statement is;

(a) Correct (b) Incorrect (c) Cannot say (d) None of the Above

9. The basic objectives of Working Capital Management are:

(a) Optimum utilization of resources for profitability

(b) To meet day-to-day current obligations

(c) Ensuring marginal return on current assets is always more than cost of capital

(d) All of the above statements.

10. The term Gross Working Capital is known as:

(a) The investment in current liabilities (b) The investment in long-term liability

(c) The investment in current assets (d) None of the above.

11. The term net working capital refers to the difference between the current assets minus current liabilities.

(a) The statement is correct (b) The statement is incorrect

(c) I cannot say. (d) None of the Above

12. The term "Core current assets' was coined by:

(a) Chore Committee (b) Tandon Committee

(c) Jilani Committee (d) None of the above.

13. The concept operating cycle refers to the average time which elapses between the acquisition of raw materials and the final cash realization. This statement is:

(a) Correct (b) Incorrect (c) Partially True (d) I cannot say.

14. As a matter of self-imposed financial discipline can there be a situation of zero working capital now-a-days in some of the professionally managed organizations.

(a) Yes (b) No (c) Impossible (d) Cannot say

15. Over trading arises when a business expands beyond the level of funds available. The statement is:

(a) Incorrect (b) Correct (c) Partially correct (d) I cannot say

16. A Conservative Working Capital strategy calls for high levels of current assets in relation to sales.

(a) I agree (b) Do not agree (c) I cannot say (d) None of the Above

17. The term Working Capital leverage refer to the impact of level of working capital on company's profitability. This measures the responsiveness of ROCE for changes in current assets.

    (a) I agree (b) Do not agree

    (c) The statement is partially true. (d) None of the Above

18. The term spontaneous source of finance refers to the finance which naturally arise in the course of business operations. The statement is:

    (a) Correct (b) Incorrect (c) Partially Correct (d) I cannot say

19. Under hedging approach to financing of working capital requirements of a firm, each asset in the balance sheet assets side would be offset with a financing instrument of the same approximate maturity. This statement is:

    (a) Incorrect (b) Correct (c) Partially correct (d) I cannot say

20. X Ltd. distributes its products to more than 500 retailers. The company's collection period is 30 days and keeps its inventory for 20 days. The operating cycle would be

    (a) 40 Days (b) 43 Days (c) 45 Days (d) 50 Days

21. Factoring is a method of financing whereby a firm sells its trade debts at a discount to a financial institution. The statement is:

    (a) Correct (b) Incorrect (c) Partially correct (d) I cannot say

22. A factoring arrangement can be both with recourse as well as without recourse:

    (a) True (b) False (c) Partially correct (d) Cannot say

23. The Bank financing of working capital will generally be in the following form. Cash Credit, Overdraft, bills discounting, bills acceptance, line of credit; Letter of credit and bank guarantee.

    (a) I agree (b) I do not agree (c) I cannot say (d) None of the Above

24. When the items of inventory are classified according to value of usage, the technique is known as:

    (a) XYZ Analysis (b) ABC Analysis (c) DEF Analysis (d) None of the above

25. When a firm advises its customers to mail their payments to special Post Office collection centers, the system is known as.

    (a) Concentration banking (b) Lock Box system

    (c) Playing the float (d) None of the above

26. The annual demand for an item is 3,200 units. The unit cost is ₹6 and inventory carrying charges is 25% p.a. If the cost of one procurement is ₹150, determine:
(i) E.O.Q (ii) No. of orders per year (iii) Time between two consecutive orders.

(a) 400 units ; 8 orders ; 1.5 months (b) 800 units ; 4 orders ; 3 months

(c) 200 units ; 16 0rders ; 0.75 months (d) None of the above

27. Working capital is calculated as ____

(a) Core current assets less core current liabilities (b) Current assets less current liabilities

(c) Core current assets less current liabilities (d) Liquid assets less current liabilities

28. The basic current liabilities are_____

(a) accounts payable and bills payable (b) bank overdraft

(c) outstanding expenses. (d) All of the above

29. There are two concepts of working capital – Gross and ____

(a) Zero (b) Net (c) Cumulative (d) Distinctive

30. Working capital is also known as____ capital.

(a) Current asset (b) Operating (c) Projecting (d) Operation

31. _____ Working Capital refers to the firm's investment in current assets.

(a) Zero (b) Net (c) Gross (d) Distinctive

32. In finance, "Working Capital" means the same thing as ____ assets.

(a) Current (b) Fixed (c) Total (d) All of the above

33. _____ Working capital refers to the _____ difference between current assets and current liabilities.

(a) Zero (b) Net (c) Gross (d) Distinctive

34. A ____ net working capital will arise when Current Assets exceed Current Liabilities.

(a) Summative (b) Negative (c) Excessive (d) Positive

35. A ____ net working capital occurs when current liabilities are in excess of current assets.

(a) Positive (b) Negative (c) Excessive (d) Zero

36. _____is not an advantages of trade credit.

(a) buyout financing (b) informality (c) easy availability (d) flexibility

37. _____ refers to the funds, which an organisation must possess to finance its day to day operations.

(a) Retained earnings (b) Fixed capital (c) Working Capital (d) All of the above

38. Investment in current assets should be _____

(a) Just adequate (b) More (c) Less (d) Maximum

39. ____ varies inversely with profitability.

(a) Risk (b) Assets (c) Liquidity (d) Revenue

40. Capital intensive firms rely on _____

(a) Debt (b) Retained earnings (c) Short Term Debts (d) Equity

41. On the basis of _____, working capital is classified as Gross Working Capital and Net Working Capital.

(a) Concept (b) Time (c) Future (d) Work

42. _____ cycle analyzes the accounts receivable, inventory, and accounts payable cycles in terms of a number of days?

(a) Business (b) Current Asset (c) Operation (d) Operating

43. _____ method is not used for calculating working capital cycle

(a) Trial and error method (b) cash cost method analysis method

(c) Percentage of sales method (d) Operating cycle approach

44. On the basis of ____, working capital may be classified as:

1) Permanent or fixed working capital.

2) Temporary or variable working capital.

(a) Concept (b) Time (c) Future (d) Work

45. Operating cycle is also called as ____

(a) Business cycle (b) Working Capital Cycle

(c) Working cycle (d) Current asset cycle

46. Spontaneous financing consists of ___

(a) a line of credit (b) short-term loans

(c) accounts receivable (d) accounts payable

47. The excess of Current Assets over Current Liabilities is called:

(a) Net Current Assets (b) Net Working Capital

(c) Working Capital (d) All of the above

48. Average collection period is 2 months, cash sales and average receivables are ₹ 5,00,000 and ₹ 6,50,000 respectively. The sales amount would be-

(a) ₹ 40,00,000 (b) ₹ 42,00,000 (c) ₹ 44,00,000 (d) ₹ 48,50,000

49. If the current ratio is 2.4:1 and working capital is ₹ 25,20,000, find the amount of current assets and current liabilities.

(a) Current Assets ₹ 43,20,000 and Current Liabilities ₹ 18,00,000

(b) Current Assets ₹ 44,00,000 and Current Liabilities ₹ 18,50,000

(c) Current Assets ₹ 43,20,000 and Current Liabilities ₹ 19,00,000

(d) Current Assets ₹ 46,60,000 and Current Liabilities ₹ 18,00,000

Answers to the MCQs

1.	(a)	2.	(c)	3.	(c)	4.	(c)	5.	(b)	6.	(a)
7.	(a)	8.	(a)	9.	(b)	10.	(c)	11.	(a)	12.	(b)
13.	(a)	14.	(a)	15.	(b)	16.	(a)	17.	(a)	18.	(a)
19.	(b)	20.	(d)	21.	(a)	22.	(a)	23.	(a)	24.	(b)
25.	(b)	26.	(b)	27.	(b)	28.	(d)	29	(b)	30.	(b)
31.	(c)	32.	(a)	33.	(b)	34.	(d)	35.	(b)	36.	(a)
37.	(c)	38.	(a)	39.	(c)	40.	(a)	41.	(a)	42.	(d)
43.	(a)	44.	(b)	45.	(b)	46.	(d)	47.	(d)	48.	(c)
49.	(a)										