NEW SYLLABUS

CA INTERMEDIATE

PAPER 6A

FINANCIAL MANAGEMENT

MAY 2024 ONWARDS

VOL - II

PRACTICE MANUAL

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FINANCIAL MANAGEMENT

PRACTICE MANUAL FOR CA INTERMEDIATE

by

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PREFACE

It gives me immense pleasure to present this Practice Manual on Financial Management Accounting designed specifically for students pursuing the Intermediate level of Chartered Accountancy (CA) course as per the **New Syllabus** notified in 2023 applicable from May 2024 exam onwards.

How to use this book?

This Practice Manual is a **COMPILER** of Past 12 Exam & RTP Questions with solutions. The questions & solutions have been neatly arranged chapter wise starting from latest Exam/RTP questions to the earlier ones.

Read every question carefully and try to solve it on your own in a separate notebook in an exam-like environment with a timer. Once done, check your answer with the solution provided and the end of every chapter and make the **corrections in a RED PEN**.

This will help you in the following ways -

- Familiarize yourself with the **exam format**, types of questions, and **time management**.
- **Build confidence** in the subject by identifying your strength & weakness chapter wise.
- Write your main exam with **less element of surprise**.
- Improve your **Speed** and **Accuracy** while solving the questions in the main exam.
- Complete the entire exam paper **on time**.
- Identify the **repeatedly tested exam questions** by noting its frequency in exam.

I am forever grateful to **my parents** and my **brother Hari**, for their constant motivation and support in all walks of my life. Many thanks to my friends Mohit and Srinivas who have stood by me through thick and thin in various phases of my life no matter what. I also thank the efforts of my student Bharathi, who helped me in editing the contents of this book.

Finally, none of this would have been a reality without the blessings of **Shri Kanchi Maha Periyava** and I bow down to the great lineage of gurus originating from Shri Adi Shankaracharya.

I wish the students the very best in all their future endeavors. As the famous verse from the Bhagavad Gita goes - ***"Your right is for action alone, never for the results. Do not become the agent of the results of action. May you not have any inclination for inaction."***

So, give your best and leave the rest. Success will automatically follow.

With Best Wishes,

CA Ganesh Bharadwaj

"Work Hard in Silence. Let your success make all the noise."

CONTENTS

CHAPTER 1: COST OF CAPITAL

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

Capital structure of D Ltd. as on 31stMarch, 2023 is given below:

Particulars	₹
Equity share capital [₹ 10 each]	30,00,000
8% Preference share capital [₹ 100 each]	10,00,000
12% Debentures [₹ 100 each]	10,00,000

- Current market price of equity share is ₹ 80 per share. The company has paid dividend of ₹ 14.07 per share. Seven years ago, it paid dividend of ₹ 10 per share. Expected dividend is ₹ 16 per share.
- 8% Preference shares are redeemable at 6% premium after five years. Current market price per preference share is ₹ 104.
- 12% debentures are redeemable at 20% premium after 10 years. Flotation cost is ₹ 5 per debenture.
- The company is in 40% tax bracket.
- In order to finance an expansion plan, the company intends to borrow 15% Long-term loan of ₹ 30,00,000 from bank. This financial decision is expected to increase dividend on equity share from ₹ 16 per share to ₹ 18 per share. However, the market price of equity share is expected to decline from ₹ 80 to ₹ 72 per share, because investors' required rate of return is based on current market conditions.

Required:

(i) Determine the existing Weighted Average Cost of Capital [WACC] taking book value weights.

(ii) Compute Weighted Average Cost of Capital [WACC] after the expansion plan taking book value weights.

Interest Rate	1%	2%	3%	4%	5%	6%	7%
FVIFi,5	1.051	1.104	1.159	1.217	1.276	1.338	1.403
FVIFi,6	1.062	1.126	1.194	1.265	1.340	1.419	1.501
FVIFi,7	1.072	1.149	1.230	1.316	1.407	1.504	1.606

PROBLEM – 2 [NOV 22]

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 Shares [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.

PROBLEM – 3 [MAY 22]

A company issues:

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

Assuming corporate tax rate is 40%.

(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

PROBLEM – 4 [NOV 21]

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

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

	₹ 15,00,000

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

Calculate WACC on the basis of market value weights.

PROBLEM – 5 [JULY 21]

Following are the information of TT Ltd.:

Particulars	
Earnings per share	₹ 10
Dividend per share	₹ 6
Expected growth rate in Dividend	6%
Current market price per share	₹ 120
Tax Rate	30%
Requirement of Additional Finance	₹ 30 lakhs
Debt Equity Ratio [For additional finance]	2:1
Cost of Debt	
0-5,00,000	10%
5,00,001 - 10,00,000	9%
Above 10,00,000	8%

Assuming that there is no Reserve and Surplus available in TT Ltd. You are required to:

(a) Find the pattern of finance for additional requirement

(b) Calculate post tax average cost of additional debt

(c) Calculate cost of equity

Calculate the overall weighted average after tax cost of additional finance.

PROBLEM – 6 [JAN 21]

The Capital structure of PQR Ltd. is as follows:

	₹
10% Debenture	3,00,000
12% Preference Shares	2,50,000
Equity Share [face value ₹ 10 per share]	5,00,000
	10,50,000

Additional Information:

(i) ₹ 100 per debenture redeemable at par has 2% floatation cost & 10 years of maturity. The market price per debenture is ₹ 110.

(ii) ₹ 100 per preference share redeemable at par has 3% floatation cost & 10 years of maturity. The market price per preference share is ₹ 108.

(iii) Equity share has ₹ 4 floatation cost and market price per share of ₹ 25. The next year expected dividend is ₹ 2 per share with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.

(iv) Corporate Income Tax rate is 30%.

Calculate Weighted Average Cost of Capital [WACC] using market value weights

PROBLEM – 7 [NOV 20]

TT Ltd. issued 20,000, 10% convertible debenture of ₹ 100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert debentures into equity shares of the company in ratio of 1:5 [5 shares for each debenture]. The current market price of the equity share is ₹ 20 each and historically the growth rate of the share is 4% per annum. Assuming tax rate is 25%. Compute the cost of 10% convertible debenture using Approximation Method and Internal Rate of Return Method.

PV Factor are as under:

Year	1	2	3	4	5
PV Factor @ 10%	0.909	0.826	0.751	0.683	0.621
PV Factor @ 15%	0.870	0.756	0.658	0.572	0.497

PROBLEM – 8 [NOV 19]

A Company wants to raise additional finance of ₹ 5 crore in the next year. The company expects to retain ₹ 1 crore earning next year. Further details are as follows:

The amount will be raised by equity and debt in the ratio of 3: 1.

The additional issue of equity shares will result in price per share being fixed at ₹ 25.

The debt capital raised by way of term loan will cost 10% for the first ₹ 75 lakh and 12% for the next ₹ 50 lakh.

The net expected dividend on equity shares is ₹ 2.00 per share. The dividend is expected to grow at the rate of 5%.

Income tax rate is 25%.

You are required:

i. To determine the amount of equity and debt for raising additional finance.

ii. To determine the post-tax average cost of additional debt.

iii. To determine the cost of retained earnings and cost of equity.

iv. To compute the overall weighted average cost of additional finance after tax.

PROBLEM – 9 [NOV 18]

Alpha Ltd. has furnished the following information :

- Earning Per Share [EPS] ₹ 4
- Dividend payout ratio 25%
- Market price per share ₹ 50
- Rate of tax 30%
- Growth rate of dividend 10%

The company wants to raise additional capital of ₹ 10 lakhs including debt of ₹ 4 lakhs. The cost of debt [before tax] is 10% up to ₹ 2 lakhs and 15% beyond that. Compute the after tax cost of equity and debt and also weighted average cost of capital

PART – B: [REVISION TEST PAPERS]

PROBLEM – 10 [RTP - NOV 23]

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

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

You are required:

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

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

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

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

PROBLEM – 11 [RTP - MAY 23]

Amrit Corporation has the following book value capital structure:

Equity Capital [50 lakh shares of ₹ 10 each].	₹ 5,00,00000
15% Preference share [50,000 shares ₹ 100 each]	₹ 50,00,000
Retained earnings	₹ 4,00,00,000

Debentures 14% [2,50,000 debentures ₹ 100 each]	₹ 2,50,00,000
Term loan 13%	₹ 4,00,00000

The companies last year earnings per share was ₹ 5, and it maintains a dividend pay-out ratio of 60% and returns on equity is 10%. The market price per share is ₹ 20.8. Preference share redeemable after 10 years is currently selling for ₹ 90 per share. Debentures redeemable after 6 years are currently selling for ₹ 75 per debenture. The income tax rate is 40%.

(a) CALCULATE the Weighted Average Cost of Capital [WACC] using market value proportions.

(b) DETERMINE the Marginal Cost of Capital [MACC] if it needs ₹ 5,00,00000 next year assuming the amount will be raised by 60% equity, 20% debt and 20% retained earnings. Equity issues will fetch a net price of ₹ 14 and cost of debt will be 13% before tax up to ₹ 40,00,000 and beyond ₹ 40,00,000 it will be 15% before tax.

PROBLEM – 12 [RTP - NOV 22]

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 3 years 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

You are required to CALCULATE the rate of interest on bank loan and debentures if tax rate applicable is 25%.

PROBLEM – 13 [RTP - MAY 22]

The information relating to book value [BV] and market value [MV] weights of Ex Limited is given below:

Sources	Book Value [₹]	Market Value [₹]
Equity shares	2,40,00,000	4,00,00,000
Retained earnings	60,00,000	-
Preference shares	72,00,000	67,50,000
Debentures	18,00,000	20,80,000

Additional information:

Equity shares are quoted at ₹ 130 per share and a new issue priced at ₹ 125 per share will be fully subscribed; flotation costs will be ₹ 5 per share on face value.

During the previous 5 years, dividends have steadily increased from ₹ 10 to ₹ 16.105 per share.

Dividend at the end of the current year is expected to be ₹ 17.716 per share.

15% Preference shares with face value of ₹ 100 would realise ₹ 105 per share.

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% on face value. Corporate tax rate is 30%.
You are required to DETERMINE the weighted average cost of capital of Ex Limited using both the weights.

PROBLEM – 14 [RTP - NOV 21]

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

PROBLEM – 15 [RTP - MAY 21]

Indel Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2021:

Particulars	[₹]
14% Debentures	60,000
11% Preference shares	20,000
Equity Shares [10,000 shares]	3,20,000
	4,00,000

The company share has a market price of ₹ 47.20. Next year dividend per share is 50% of year 2020 EPS. The following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS [₹]	Year	EPS [₹]
2011	2.00	2016	3.22
2012	2.20	2017	3.54
2013	2.42	2018	3.90
2014	2.66	2019	4.29
2015	2.93	2020	4.72

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ₹ 96.
Preference shares of ₹ 18.50 [with annual dividend of ₹ 2.22 per share] were also issued. The company is in 30% tax bracket.

(A) CALCULATE after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

(iii) New equity share [assuming new equity from retained earnings]

(B) CALCULATE marginal cost of capital when no new shares are issued.

(C) DETERMINE the amount that can be spent for capital investment before new ordinary shares must be sold, assuming that the retained earnings for next year's investment is 50 percent of earnings of 2020.

(D) COMPUTE marginal cost of capital when the fund exceeds the amount calculated in [C], assuming new equity is issued at ₹ 40 per share?

PROBLEM – 16 [RTP - NOV 20]

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:

Particulars	[₹]
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 debenture Preference shares ₹ 110 per preference share Equity shares ₹ 24 each.

Additional information:

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

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

(iii) 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.

PROBLEM – 17 [RTP - MAY 20]

PK Ltd. has the following book-value capital structure as on March 31, 2020.

	[₹]
Equity share capital [10,00,000 shares]	2,00,00,000
11.5% Preference shares	60,00,000
10% Debentures	1,00,00,000
	3,60,00,000

The equity shares of the company are sold for ₹ 200. It is expected that the company will pay next year a dividend of ₹ 10 per equity share, which is expected to grow by 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

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

(ii) COMPUTE the new WACC, if the company raises an additional ₹50 lakhs debt by issuing 12% debentures. This would result in increasing the expected equity dividend to ₹12.40 and leave the growth rate unchanged, but the price of equity share will fall to ₹ 160 per share.

PROBLEM – 18 [RTP - NOV 19]

KM Ltd. has the following capital structure on September 30, 2019:

Sources of capital	[₹]
Equity Share Capital [40,00,000 Shares of ₹ 10 each]	4,00,00,000
Reserves & Surplus	4,00,00,000
12% Preference Shares	2,00,00,000
9% Debentures	6,00,00,000
	16,00,00,000

The market price of equity share is ₹60. It is expected that the company will pay next year a dividend of ₹6 per share, which will grow at 10% forever. Assume 40% income tax rate.

You are required to COMPUTE weighted average cost of capital using market value weights.

PROBLEM – 19 [RTP - MAY 19]

As a financial analyst of a large electronics company, you are required to DETERMINE the weighted average cost of capital of the company using [a] book value weights and [b] market value weights.

The following information is available for your perusal.

The Company's present book value capital structure is:

	[₹]
Debentures [₹100 per debenture]	8,00,000
Preference shares [₹100 per share]	2,00,000
Equity shares [₹10 per share]	10,00,000
	20,00,000

All these securities are traded in the capital markets. Recent prices are:

Debentures, ₹110 per debenture, Preference shares, ₹120 per share, and Equity shares, ₹ 22 per share

Anticipated external financing opportunities are:

₹ 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, ₹ 100

₹ 100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, ₹100.

Equity shares: ₹ 2 per share flotation costs, sale price = ₹ 22.

In addition, the dividend expected on the equity share at the end of the year is ₹ 2 per share, the anticipated growth rate in dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 percent.

ANSWERS

1.

[a] Growth rate in Dividends

14.07 = 10 x FVIF [i,7 years]

FVIF [i,7 years] = 1.407

FVIF [5%, 7 years] = 1.407

i = 5%

Growth rate in dividend= 5%

[b] Cost of Equity

$$K_e = \frac{D_1}{P_0} + g$$

$$K_e = \frac{16}{80} + 0.05$$

Ke = 25%

[c] Cost of Preference Shares

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

$$K_p = \frac{8 + \frac{(106 - 104)}{5}}{\frac{(106 + 104)}{2}}$$

K_p = 8.4 / 105 = 8%

[d] Cost of Debt

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

$$K_d = \frac{12(1 - 0.4) + \frac{(120 - 95)}{10}}{\frac{(120 + 95)}{2}}$$

Kd = [7.2 + 2.5] / 107.5 = 9.02%

Kd = 9.02%

Calculation of existing Weighted Average Cost of Capital WACC]

Capital	Amount [Rs.]	Weights	Cost	WACC
Equity Share capital	30,00,000	0.6	25%	15.00%
Preference share capital	10,00,000	0.2	8%	1.60%
Debenture	10,00,000	0.2	9.02%	1.80%

Alternative presentation

[i] Computation of existing WACC on book value weights

Source [1]	Book value [₹] [2]	Weight [3]	Cost of capital [%] [4]	Product [2] x [4]
Equity share capital	30,00,000	0.60	25	7,50,000
Preference share capital	10,00,000	0.20	8	80,000
Debentures	10,00,000	0.20	9.02	90,200
Total	**50,00,000**	**1.00**		**9,20,200**

WACC = [Product / Total book value] x 100 = [9,20,200 /50,00,000] x 100 = **18.4%**

[ii] Cost of Long Term Debt = 15% [1-0.4] = 9%

Revised Ke = = 30% 18 + 0.05 72

Calculation of WACC after expansion taking book value weights

Capital	Amount	Weights	Cost	W.C
Equity Share Capital	30,00,000	0.3750	30%	11.25%
Preference Share Capital	10,00,000	0.1250	8%	1.00%
Debenture	10,00,000	0.1250	9.02%	1.13%
Long Term Debt	30,00,000	0.3750	9.00%	3.38%
	80,00,000	1.0000		**16.76%**

Alternative presentation

[i] Computation of WACC on book value weights after expansion

Source [1]	Book value [₹] [2]	Weight [3]	Cost of capital [%] [4]	Product [2] x [4]
Equity share capital	30,00,000	0.375	30	9,00,000
Preference share capital	10,00,000	0.125	8	80,000
Debentures	10,00,000	0.125	9.02	90,200
Long term loan	30,00,000	0.375	9	2,70,000
Total	**80,00,000**	**1.00**		**13,40,200**

WACC = [Product / Total book value] x 100 = [13,40,200 / 80,00,000] x 100 **= 16.76%**

2.

Computation of WACC on the basis of market value

W.N. 1

Cum-dividend price of Preference shares = ₹ 18

Less: Dividend [8/100] x 25 = ₹ 2

∴ Market Price of Preference shares = ₹ 16

Kp = 2 / 16= 0.125 [or] 12.5% 2 16

No. of Preference shares = 4,00,000 / 25 = 16,000

W.N. 2

Market price of Debentures = [120 / 100]x 100 = ₹ 120

Kd = 12 [1 – 0.3] / 120= 0.07 [or] 7%

No. of Debentures = 6,00,000 / 100 = 6,000

W.N.3

Market Price of Equity shares = ₹ 39

Ke [given] = 19% or 0.19

No. of Equity shares = 5,00,000 / 10 = 50,000

Sources	Market Value [₹]	Nos.	Total Market value [₹]	Weight	Cost of Capital	Product
Equity Shares	39	50,000	19,50,000	0.6664	0.19	0.1266
Preference Shares	16	16,000	2,56,000	0.0875	0.125	0.0109
Debenture s	120	6,000	7,20,000	0.2461	0.07	0.0172
					WACC =	0.1547

WACC = 0.1547 or 15.47%

3.

[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 = $\frac{D_7}{k_e - g} = \frac{12.76(1.05)^7}{0.325 - 0.05}$

P6 = $\frac{12.76 \times 1.407}{0.275}$

P6 = 65.28

Redemption Value of Debenture [RV] = 65.28 × 2 = **130.56** [RV]

NP = 95

n = 6

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

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

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

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

= 3% + 2% / 17.04 x 13.65

K_p = 4.6021%

4.

Calculation of Cost of Capital of debentures ignoring market value:

Cost of Debentures [Kd]= 12 [1 - .30] = 8.40%

Computation of Weighted Average Cost of Capital based on Market Value Weights

Source of Capital	Market Value [₹]	Weights to Total Capital	After tax Cost of capital [%]	WACC [%]
Debentures [6,000 nos. × ₹ 110]	6,60,000	0.45[approx.]	8.40	3.78
Equity Shares [4,500 nos. × ₹ 180]	8,10,000	0.55[approx.]	24.00	13.20
	14,70,000	1.00		16.98

Note: Cost of Debenture and Cost of equity considered as given without considering market value. Cost of sources of capital can be computed based on the Market price and accordingly Weighted Average Cost of Capital can be calculated as below:

Calculation of Cost of Capital for each source of capital considering market value of capital:

[1] Cost of Equity share capital:

$$Ke = \frac{\text{Earnings}}{\text{Marketpricepershare}} = \frac{24\% x Rs.100}{Rs.180} = 13.333\%$$

[2] Cost of Debentures $[K_d] = \frac{I(1-t)}{NP} = \frac{Rs.12(1-0.3)}{Rs.110} = 7.636\%$

Computation of Weighted Average Cost of Capital based on Market Value Weights

Source of Capital	Market Value [₹]	Weights to Total Capital	After tax Cost of capital [%]	WACC [%]
Debentures [6,000 nos. × ₹ 110]	6,60,000	0.45[approx.]	7.636	**3.44** [approx.]
Equity Shares [4,500 nos. × ₹ 180]	8,10,000	0.55[approx.]	13.333	**7.33** [approx.]
	14,70,000	1.00		**10.77** [approx.]

5.

[a] Pattern of raising additional finance

Equity	1/3 of ₹ 30,00,000	= ₹ 10,00,000
Debt	2/3 of ₹ 30,00,000	= ₹ 20,00,000

The capital structure after raising additional finance:

Particulars	[₹]
Shareholder's Funds	
Equity Capital	10,00,000

Debt [Interest at 10% p.a.]	5,00,000
[Interest at 9% p.a.]	5,00,000
[Interest at 8% p.a.] [20,00,000–10,00,000]	10,00,000
Total Funds	**30,00,000**

[b] Determination of post-tax average cost of additional debt

Kd = I [1 – t]

Where,

I = Interest Rate

t = Corporate tax-rate

On First ₹ 5,00,000 = 10% [1 – 0.3] = 7% or 0.07

On Next ₹ 5,00,000 = 9% [1 – 0.3] = 6.3% or 0.063

On Next ₹ 10,00,000 = 8% [1 – 0.3] = 5.6% or 0.056

Average Cost of Debt =

$$\frac{(5,00,000\times 0.07)(5,00,000\times 0.063)(10,00,000\times 0.056)}{Rs.20,00,000}\times 100 = \textbf{6.125\%}$$

[c] Determination of cost of equity applying Dividend growth model: Ke =

$$K_e = \frac{D_1}{P_0} + g$$

Where, Ke = Cost of equity

D_1 = D0 [1+ g]

D_0 = Dividend paid g = Growth rate = 6%

P_0 = Current market price per share = ₹ 120

$$K_e = \frac{Rs.6(1+0.06)}{Rs.120} + 0.06 = \frac{Rs.6.36}{Rs.120} + 0.06 = 0.113 \text{ or } 11.3\%$$

[d] Computation of overall weighted average after tax cost of additional finance

Particulars	[₹]	Weights	Cost of funds	Weighted Cost [%]
Equity	10,00,000	1/3	11.3%	3.767
Debt	20,00,000	2/3	%	4.083
WACC	30,00,000			**7.85**

[Note: In the above solution different interest rate have been considered for different slab of Debt]

Alternative Solution

[a] Pattern of raising additional finance

Equity 1/3 of ₹ 30,00,000 = ₹ 10,00,000

Debt 2/3 of ₹ 30,00,000 = ₹ 20,00,000

The capital structure after raising additional finance:

Particulars	[₹]
Shareholders' Funds	
Equity Capital	10,00,000
Debt [Interest at 8% p.a.]	20,00,000
Total Funds	**30,00,000**

[b] Determination of post-tax average cost of additional debt

$K_d = I [1 – t]$

Where,

I = Interest Rate

t = Corporate tax-rate

K_d = 8% [1 – 0.3] = 5.6%

[c] Determination of cost of equity applying Dividend growth model:

$$K_e = \frac{D_1}{P_0} + g$$

Where,

K_e = Cost of equity

D_1 = D0 [1+ g]

D_0 = Dividend paid

g = Growth rate =6%

P_0 = Current market price per share = ₹ 120

Then, Ke = $\frac{Rs.6(1+0.06)}{Rs.120} + 0.06 = \frac{Rs.6.36}{Rs.120} + 0.06 = 0.113 or 11.3\%$

[d] Computation of overall weighted average after tax cost of additional finance

Particulars	[₹]	Weights	Cost of funds	Weighted Cost [%]
Equity	10,00,000	1/3	11.3%	3.767
Debt	20,00,000	2/3	5.6%	3.733
WACC			30,00,000	**7.50**

Note: In the above solution single interest rate have been considered for Debt]D

6.

Workings:

1. **Cost of equity [K_e] =** $\frac{D_1}{P_0 - F} + g = \frac{Rs.2}{Rs.25 - Rs.4} + 0.05 = 0.145 (Approx.)$

2. Cost of Debt [K_d] = $$\frac{I(1-t)+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

$$= \frac{10(1-0.3)+\frac{(100-98)}{10}}{\frac{(100+98)}{2}} = \frac{7+0.2}{99} = 0.073(\text{Approx.})$$

3. Cost of preference shares [K_p] = $$\frac{PD+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

$$= \frac{12+\frac{(100-97)}{10}}{\frac{(100+97)}{2}} = \frac{12+0.3}{98.5} = 0.125(\text{Approx.})$$

Calculation of WACC using market value weights

Source of capital	**Market Value**	**Weights**	**After tax cost of capital**	**WACC [Ko]**
	[₹]	**[a]**	**[b]**	**[c] = [a] × [b]** 10%
Debentures [₹ 110 × 3,000]	3,30,000	0.178 0.07	3 0.013	
12% Preference shares [₹ 108 × 2,500]	2,70,000	0.146	0.125	0.018
Equity shares [₹ 25 × 50,000]	12,50,000	0.676	0.145	0.098
	18,50,000	1.00		**0.129**

WACC [Ko] = **0.129 or 12.9%** [approx.]

7.

Determination of Redemption value:

Higher of-

[i] The cash value of debentures = ₹ 100

[ii] Value of equity shares = 5 shares × ₹ 20 [1+0.04]5

= 5 shares × ₹ 24.333

= ₹ **121.665 rounded to ₹ 121.67**

₹ 121.67 will be taken as redemption value as it is higher than the cash option and attractive to the investors.

Calculation of Cost of 10% Convertible debenture

[i] Using Approximation Method:

$$Kd = \frac{INT(1-t)+\frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} = \frac{10(1-0.25)+\frac{(121.67-100)}{5}}{\frac{(121.67+100)}{2}} = \frac{7.5+4.334}{110.835} = 10.676\%$$

[ii] Using Internal Rate of Return Method

Year	Cash flows [₹]	Discount factor @ 10%	Present Value	Discount factor @ 15%	Present Value [₹]
0	100	1.000	[100.00]	1.000	[100.00]
1 to 5	7.5	3.790	28.425	3.353	25.148
5	121.67	0.621	75.557	0.497	60.470
NPV			**+3.982**		**-14.382**

$$IRR = L+\frac{NPV_L}{NPV_L-NPV_H}(H-L) = 10\%+\frac{3.982}{3.982-(-14.382)}(15\%-10\%)$$

= **0.11084 or 11.084% [approx.]**

8.

Initial Investment = ₹ 4,50,000

Salvage Value = ₹ 50,000

Useful Life = 5 years

Calculation of cash flow in each scenario

Particulars	Scenario		
	Worst case	Most Likely	Best case
Contribution	3,30,000	5,40,000	6,31,250
Less: Fixed Cost	75,000	1,50,000	2,00,000
Less: Depreciation	80,000	80,000	80,000
Profit before tax	1,75,000	3,10,000	3,51,250
Less: Taxes	70,000	1,24,000	1,40,500
Profit after tax	1,05,000	1,86,000	2,10,750
Add: Depreciation	80,000	80,000	80,000
Cash Flow After Tax	1,85,000	2,66,000	2,90,750

The possible outcomes will be as follows:

Year	PVF @ 12%	Worst Case	Most likely	Best case

		Cash Flow	PV	Cash Flow	PV	Cash Flow	PV
0	1	[4,50,000]	[4,50,000]	[4,50,000]	[4,50,000]	[4,50,000]	[4,50,000]
1-5	3.605	1,85,000	6,66,925	2,66,000	9,58,930	2,90,750	10,48,153.75
5	0.567	50,000	28,350	50,000	28,350	50,000	28,350
NPV			**2,45,275**		**5,37,280**		**6,26,503.75**

Alternative presentation

[i] Computation of NPV of different scenarios

Years	DF	Worst case		Most-likely case		Best case	
		CF	DCF	CF	DCF	CF	DCF
0	1.000	[450000]	[450000]	[450000]	[450000]	[450000]	[450000]
1	0.893	185000	165205	266000	237538	290750	259640
2	0.797	185000	147445	266000	212002	290750	231728
3	0.712	185000	131720	266000	189392	290750	207014
4	0.636	185000	117660	266000	169176	290750	184917
5	0.567	185000	104895	266000	150822	290750	164855
5	0.567	50000	28350	50000	28350	50000	28350
NPV			**2,45,275**		**5,37,280**		**6,26,504**

[ii] If the company is certain about the most likely result in first two years but uncertain about the remaining period, then, NPV expecting worst case scenario during next two years and best-case scenario in remaining period will be as follows:

$$= -4,50,000 + \frac{Rs.2,66,000}{(1+0.12)} + \frac{Rs.2,66,000}{(1+0.12)^2} + \frac{Rs.1,85,000}{(1+0.12)^3} + \frac{Rs.1,85,000}{(1+0.12)^4} + \frac{Rs.2,90,750}{(1+0.12)^5} + \frac{Rs.50,000}{(1+0.12)^5}$$

= -4,50,000 + [2,66,000 × 0.893] + [2,66,000 × 0.797] + [1,85,000 × 0.712] + [1,85,000 × 0.636] + [2,90,750 × 0.567] + [50,000 × 0.567]

= -4,50,000 + 2,37,538 + 2,12,002 + 1,31,720 + 1,17,660 + 1,64,855 + 28,350

= ₹ 4,42,125

Alternative presentation

[ii] Computation of NPV on the basis of fixed scenarios

Years	Scenarios	DF	CF	DCF [DF*CF]
0	Initial Outflow	1.000	[450000]	**[450000]**
1	Most-likely case	0.893	266000	**237538**
2	Most-likely case	0.797	266000	**212002**
3	Worst case	0.712	185000	**131720**
4	Worst case	0.636	185000	**117660**
5	Best case	0.567	290750	**164855**
5	Salvage	0.567	50000	**28350**

	4,42,125

[All figures are in ₹]

9.

[i] Cost of Equity Share Capital [Ke]

$$K_e = \frac{D_0(1+g)}{P_0} + g = \frac{25\%\text{ of Rs.4}(1+0.10)}{\text{Rs.50}} + 0.10 = \frac{\text{Rs.1.10}}{\text{Rs.50}} + 0.10 = 0.122 \text{ or } 12.2\%$$

[ii] Cost of Debt [Kd]

$$K_d = \frac{\text{Interest}}{\text{Net Proceeds}} \times 100 \times (1-t)$$

Interest on first ₹ 2,00,000 @ 10% = ₹ 20,000

Interest on next ₹ 2,00,000 @ 15% = ₹ 30,000

$$K_d = \frac{50,000}{4,00,000} \times (1-0.3) = 0.0875 \text{ or } 8.75\%$$

[iii] Weighted Average Cost of Capital [WACC]

Source of capital	Amount [₹]	Weights	Cost of Capital [%]	WACC [%]
Equity shares	6,00,000	0.60	12.20	7.32
Debt	4,00,000	0.40	8.75	3.50
Total	10,00,000	1.00		**10.82**

Alternatively Cost of Equity Share Capital [Ke] can be calculated as

$$K_e = \frac{D}{P_0} + g = \frac{25\%\text{ of Rs.4}}{\text{Rs.50}} + 0.10 = \frac{\text{Rs.1.00}}{\text{Rs.50}} + 0.10 = 0.120 \text{ or } 12.00\%$$

Accordingly

Weighted Average Cost of Capital [WACC]

Source of capital	Amount [₹]	Weights	Cost of Capital [%]	WACC [%]
Equity shares	6,00,000	0.60	12.20	7.20
Debt	4,00,000	0.40	8.75	3.50
Total	10,00,000	1.00		**10.70**

10.

[a] Cost of Equity / Retained Earnings [using dividend growth model]

$$K_e = \frac{D_1}{P_0}$$

where $D_1 = D_o [1 + g] = 2 [1 + .10] = 2.2$

K_e = = 0.15 or 15 % 2.2 + 0.10 44

[b] Cost of Debt [Post Tax]

Kd = I [1-t]

Upto 3,60,000 Kd = .08 [1-0.4] = 0.048

Beyond 3,60,000 = .12 [1-0.4] = 0.072

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

[c] Pattern for Raising Additional Finance

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

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

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

Equity Shares = 14,00,000 – 4,20,000

= 9,80,000

And Retained Earnings = 4,20,000

[d] Overall Weighted Average after tax cost of additional finance

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

11.

[a] Calculation of Cost of Equity

[i] D_0 = ₹ 5x 60%

D_0 = ₹ 3

g = b x r

= [1-0.6] x 10% = 4%

D_1 = D0 x [1 + g]

= 3 x [1 + 4%]

= 3 x 1.04 = 3.12

$K_e = \frac{D_1}{P_0} + g$

K_e = 3.12 / 20.8 + 0.04

K_e = 19%

[ii] Calculation of Cost of Preference Shares

N =10 years

NP = ₹ 90

PD = ₹ 15

RV = ₹ 100

$$Kp = \frac{PD + (RV - NP)/N}{(RV + NP)} \times 100$$

$$Kp = \frac{15 + (100 - 90)/10}{(100 + 90)/2} \times 100$$

Kp = 16/95 x 100

Kp= 16.84%

[iii] Calculation of Cost of Debentures

N = 6 years

NP = ₹ 75

Interest = ₹ 14

RV = ₹ 100

T = 40%

$$Kd = \frac{int(1 - t) + (RV - NP)/N}{(RV + NP)/2} \times 100$$

$$Kd = \frac{14 \times (1 - 0.4) + (100 - 75)/6}{(100 + 75)/2} \times 100$$

Kd=14.37%

[iv] Cost of Term Loan

Kd = Interest rate [1-t]

Kd = 13% [1-40%]

Kd = 7.8%

Calculation of Weighted Average Cost of Capital [WACC] [using market weights]

Capital	Cost of Capital	Market Value	Market Value Weights		Product [Cost x weights]
Equity	19.00%	20.8 x 50,00,000	₹ 10,40,00,000	0.6218	11.81%
Preference Shares	16.84%	90 x 50,000	₹ 45,00,000	0.0269	0.45%
Debentures	14.37%	75 x 2,50,000	₹ 1,87,50,000	0.1121	1.61%
Term Loan	7.80%	₹ 4,00,00,000	0.2392		1.87%
Total			₹ 16,72,50,000	**1**	**15.74%**

WACC= 15.74%

[b] Calculation of Marginal Cost of Capital [MACC]

The required capital of ₹ 50,000,000 will be raised as follows:

Equity = 60% of ₹ 50,000,000 = ₹ 30,000,000

Deby = 20% of ₹ 50,000,000 = ₹ 10,000,000

Retained Earnings= 20% of ₹ 50,000,000 = ₹ 10,000,000

Marginal Cost of Equity = 3.12 / 1.4 + 0.04 = 26.28%

Marginal Cost of Debt

Cost of Debt [before tax] = 13% of Rs.40,00,000 + 15% of Rs.60,00,000 / Rs.1,00,00,000

= Rs.5,20,000 + Rs.9,00,000 / Rs.1,00,00,000 = 14.2%

Cost of Debt [after tax]. = 14.2% [1-t]

= 14.2% [1-0.4]

= 8.52%

Calculation of marginal cost of capital

Capital	Cost of Capital	Value	Weights	Product [Cost x weights]
Equity	26.28%	₹ 3,00,00,000	0.6	15.77%
Reserves	26.28%	₹ 1,00,00,000	0.2	5.26%
Debt	8.52%	₹ 1,00,00,000	0.2	1.70%
Total		₹ 5,00,00,000	**1**	**22.73%**

Marginal Cost of Capital [MACC] = 22.73%

12.

Let the rate of Interest on debenture be x

∴ Rate of Interest on loan = 1.5x

$$\therefore \textbf{K}_{\textbf{d}} \textbf{ on debentures} = \frac{\text{Int}(1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{2}}$$

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

∴ K_d on bank loan = 1.5x [1 – 0.25] = 1.125x

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

KY = 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 + 22.5x 0.3 / 98.5

WACC = 15%

∴ 0.1 + 0.225x + 22.5x / 98.5 + 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 =

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%.

13.

[i] Cost of Equity $[K_e] = \frac{D_1}{P_0 - F} + g = \frac{Rs.17.716}{Rs.125 - Rs.5} + 0.10^*$

Ke = 0.2476

*Calculation of g:

₹ 10 [1+g]5 = ₹ 16.105

Or, [1+g]5 = 16.105 / 10 = 1.6105

Table [FVIF] suggests that ₹ 1 compounds to ₹ 1.6105 in 5 years at the compound rate of 10 percent. Therefore, g is 10 per cent.

[ii] Cost of Retained Earnings $[Kr] = \frac{D_1}{P_0} + g = \frac{Rs.17.716}{Rs.130} + 0.10^* = 0.2363$

[iii] Cost of Preference Shares $[Kp] = \frac{PD}{P_0} = \frac{Rs.15}{Rs.105} = 0.1429$

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

$$= \frac{Rs.15(1-0.30) + \left(\frac{Rs.100 - Rs.91.75^*}{11 years}\right)}{\frac{Rs.100 + Rs.91.75^*}{2}}$$

$$= \frac{Rs.15 \times 0.70 + Rs.0.75}{Rs.95.875} = \frac{Rs.11.25}{Rs.95.875} = 0.1173$$

*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 [P0] of debentures can also be found out using the present value method:

P0 = Annual Interest × PVIFA [16%, 11 years] + Redemption value × PVIF [16%, 11 years]

P_0 = ₹ 15 × 5.0287 + ₹ 100 × 0.1954

P_0 = ₹ 75.4305 + ₹ 19.54 = ₹ 94.9705

Net Proceeds = ₹ 94.9705 – 2% of ₹ 100 = ₹ 92.9705

Accordingly, the cost of debt can be calculated

Source of capital	**Weights**		**Specific Cost [K]**	**Total cost**	
	BV	**MV**		**[BV × K]**	**[MV × K]**
Equity Shares	240	320**	0.2476	59.4240	79.2320
Retained Earnings	60	80**	0.2363	14.1780	18.9040
Preference Shares	72	67.50	0.1429	10.2888	9.6458
Debentures	18	20.80	0.1173	2.1114	2.4398
Total	390	488.30		86.0022	110.2216

**Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings i.e., 240:60 or 4:1.

Weighted Average Cost of Capital [WACC]:

Using Book Value = ₹ 86.0022 / ₹ 390 = 0.2205 or 22.05%

Using Market Value = ₹ 110.2216 / ₹ 488.30 = 0.2257 or 22.57%

14.

Workings

a] Value of Debt = Interest / Cost of debt [K_d]

= Rs.7,50,000 / 0.08 = Rs.93,75,000

b] Value of equity capital = Operating profit – Interest / Cost of equity [K_e]

= Rs.34,50,000 – Rs.7,50,000 / 0.16 = Rs.1,68,75,000

c] New cost of equity [K_e] after proposal

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

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

$$= \frac{\text{Rs.}48,75,000 - \text{Rs.}13,50,000}{\text{Rs.}1,68,75,000} = \frac{\text{Rs.}35,25,000}{\text{Rs.}1,68,75,000} = 0.209 \text{ or } 20.9\%$$

[i] Calculation of Weighted Average Cost of Capital [WACC] before the new proposal

Sources	Amount [₹]	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	Amount [₹]	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 %**

15.

[A]

[i] Cost of new debt

K_d = 0 I[1- t] / P_0

= Rs.16[1 0.3] / Rs.96 = 0.11667

[ii] Cost of new preference shares

Kp = Rs.2.22 / Rs.18.5 = 0.12

[iii] Cost of new equity shares

$K_e = D_1 / P_0 + g$

= Rs.2.36 / Rs.47.20 + 0.10

= 0.05 + 0.10 = 0.15

Calculation of g when there is a uniform trend [on the basis of EPS]

$$= \frac{EPS(2012) - EPS(2011)}{EPS(2011)} = \frac{Rs.2.20 - Rs.2.00}{Rs.2.00} = 0.10 \text{ or } 10\%$$

Calculation of D1

D1 = 50% of 2020 EPS = 50% of ₹ 4.72 = ₹ 2.36

[B] Calculation of marginal cost of capital

Type of Capital	Proportion	Specific Cost	Product
[1]	**[2]**	**[3]**	**[2] × [3] = [4]**
Debentures	0.15	0.11667	0.0175
Preference Share	0.05	0.1200	0.0060
Equity Share	0.80	0.1500	0.1200
Marginal cost of capital			0.1435

[C] The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:

Retained earnings = 50% of EPS of 2020 × outstanding equity shares

= 50% of ₹ 4.72 × 10,000 shares = ₹ 23,600

The ordinary equity [Retained earnings in this case] is 80% of total capital.

So, ₹ 23,600 = 80% of Total Capital

∴ Capital investment before issuing equity shares = Rs.23,600 / 0.80 = Rs.29,500

[D] If the company spends in excess of ₹ 29,500, it will have to issue new equity shares at ₹ 40 per share.

∴ The cost of new issue of equity shares will be:

$$K_e = \frac{D_1}{P_0} + g = \frac{Rs.2.36}{Rs.40} + 0.10 = 0.159$$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
[1]	[2]	[3]	[2] × [3] = [4]
Debentures	0.15	0.11667	0.0175
Preference Shares	0.05	0.1200	0.0060
Equity Shares [New]	0.80	0.1590	0.1272
		Marginal cost of capital	0.1507

16.

i] Cost of Equity [K_e]

$$= \frac{D_1}{P_0 - F} + g = \frac{Rs.1}{Rs.24 - Rs.4} + 0.05 = 0.1 or 10\%$$

[ii] Cost of Debt [Kd]

Current market price [P0] – floatation cost = I[1-t] × PVAF[r,10] + RV × PVIF[r,10]

₹ 105 – 4% of ₹ 105 = ₹ 10 [1-0.3] × PVAF [r,10] + ₹ 100 × PVIF [r,10]

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

Year	Cash flows [₹]	Discount factor @ 5%	Present 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 [Kd] = 6.89%

[iii] Cost of Preference shares [Kp]

Current market price [P0] – floatation cost = PD × PVAF[r,10] + RV × PVIF[r,10]

₹ 110 – 2% of ₹ 110 = ₹ 5 × PVAF [r,10] + ₹ 100 × 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

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

Cost of Preference shares [K_p] = 4.08%

[a] Calculation of WACC using book value weights

Source of capital	Book Value	Weights	After tax cost of capital	WACC [Ko]
	[₹]	[a]	[b]	[c] = [a]×[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 [Ko] = 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 [Ko]
	[Rs.]	[a]	[b]	[c] = [a] x [b]
10% Debentures [₹ 105× 5,000]	5,25,000	0.151	0.0689	0.0104
5% Preference shares [₹ 110× 5,000]	5,50,000	0.158	0.0408	0.0064
Equity shares [₹ 24× 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%

17.

[i] Computation of Weighted Average Cost of Capital based on existing capital structure

Source of Capital	Existing Capital structure [₹]	Weights	After tax cost of capital [%]	WACC [%]
		[a]	[b]	[a] x [b]
Equity share capital [W.N.1]	2,00,00,000	0.555	10.00	5.55
11.5% Preference share capital	60,00,000	0.167	11.50	1.92
10% Debentures [W.N.2]	1,00,00,000	0.278	6.50	1.81
	3,60,00,000	1.000		9.28

Working Notes [W.N.]:

1. **Cost of equity capital:**

$$K_e = \frac{\text{ExpectedDividend}(D_1)}{\text{CurrentMarketPricepershare}(P_0)} + \text{Growth}(g)$$

$$= \frac{\text{Rs.}10}{\text{Rs.}200} + 0.05 = 10\%$$

2. **Cost of 10% Debentures**

$$= \frac{I(1-t)}{NP} = \frac{\text{Rs.}10,00,000(1-0.35)}{\text{Rs.}1,00,00,000} = 0.065 \text{ or } 6.5\%$$

[ii] Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure [₹]	Weights	After tax cost of capital [%]	WACC [%]
		[b]	[a]	[a] x [b]
Equity share capital [W.N. 3]	2,00,00,000	0.488	12.75	6.10
Preference share	60,00,000	0.146	11.50	1.68
10% Debentures [W.N. 2]	1,00,00,000	0.244	6.50	1.59
12% Debentures [W.N.4]	50,00,000	0.122	7.80	0.95
	4,10,00,000	1.00		10.32

Working Notes [W.N.]:

3. **Cost of equity capital:**

$$K_e = \frac{\text{ExpectedDividend}(D_1)}{\text{CurrentMarketPricepershare}(P_0)} + \text{Growth}(g)$$

$$= \frac{\text{Rs.}12.4}{\text{Rs.}160} + 0.05 = 0.1275 \text{ or } 12.75\%$$

2. **Cost of 10% Debentures**

$$= \frac{\text{Rs.}6,00,000(1-0.35)}{\text{Rs.}50,00,000} = 0.078 \text{ or } 7.8\%$$

$$K_d = \frac{Rs.2,40,000(1-0.35)}{Rs.20,00,000} = 0.078 \text{ or } 7.8\%$$

18.

i] Cost of Equity [K_e] = $\frac{D_1}{P_0} + g = \frac{Rs.6}{Rs.60} + 0.10 = 0.20 = 20\%$

ii] Cost of debentures [K_d] = I [1 – t] = 0.09 [1 – 0.4] = 0.054 or 5.4%

Computation of Weighted Average Cost of Capital [WACC using market value weights]

Source of capital	Market Value of capital [₹]	Weight	Cost of capital [%]	WACC [%]
9% Debentures	6,00,00,000	0.1875	5.40	1.01
12% Preference Shares	2,00,00,000	0.0625	12.00	0.75
Equity Share Capital [₹ 60 × 40,00,000 shares]	24,00,00,000	0.7500	20.00	15.00
Total	32,00,00,000	1.00		16.76

19.

Determination of specific costs:

[i] Cost Debt [Kd] $= \frac{\text{Interest}(1-t) + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{Rs.11(1-0.35) + \frac{(Rs.100-Rs.96)}{10 \text{ years}}}{\frac{(Rs.100+Rs.96)}{2}}$

$= \frac{Rs.7.15 + Rs.0.4}{Rs.98} = 0.077 \text{ or } 7.07\%$

[ii] Cost of Preference Shares [Kp] $= \frac{PD + \frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{Rs.12 + \frac{(Rs.100-Rs.95)}{10 \text{ years}}}{\frac{(Rs.100+Rs.96)}{2}}$

$= \frac{Rs.12 + Rs.0.5}{Rs.97.5} = 0.1282 \text{ or } 12.82\%$

[iii] Cost of Equity shares [Ke]

I – Interest, t – Tax, RV- Redeemable value, NP- Net proceeds, N- No. of years, PD-Preference dividend, D1- Expected Dividend, P0- Price of share [net]

Using these specific costs we can calculate WACC on the basis of book value and market value weights as follows:

[a] Weighted Average Cost of Capital [K0] based on Book value weights

Source of capital	Book value [₹]	Weights	Specific cost [%]	WACC [%]
Debentures	8,00,000	0.40	7.70	3.08
Preferences shares	2,00,000	0.10	12.82	1.28
Equity shares	10,00,000	0.50	17.00	8.50
	20,00,000	1.00		12.86

[b] Weighted Average Cost of Capital [K0] based on market value weights:

Source of capital	Market value [₹]	Weights	Specific cost [%]	WACC [%]
Debentures $\left(\frac{Rs.8,00,000}{Rs.100}\times Rs.110\right)$	8,80,000	0.265	7.70	2.04
Preferences shares $\left(\frac{Rs.2,00,000}{Rs.100}\times Rs.120\right)$	2,40,000	0.072	12.82	0.92
Equity shares $\left(\frac{Rs.10,00,000}{Rs.10}\times Rs.22\right)$	22,00,000	0.663	17.00	11.27
	33,20,000	1.000		14.23

CHAPTER 2: LEVERAGES

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

Following information is given for X Ltd.:

Total contribution [₹]	4,25,000
Operating leverage	3.125
15% Preference shares [₹ 100 each]	1,000
Number of equity shares	2,500
Tax rate	50%

Calculate EPS of X Ltd., if 40% decrease in sales will result EPS to zero.

PROBLEM – 2 [NOV 22]

The following information is available for SS Ltd.

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

You are required to:

(1) Prepare the Profit-Loss statement of SS Ltd

(2) Find out the number of equity shares.

PROBLEM – 3 [MAY 22]

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

Sales	₹ 86 lakhs
Profit Volume [P/V] Ratio	35%
Fixed Cost excluding interest expenses	₹ 10 lakhs
10% Debt	₹ 55 lakhs
Equity Share Capital of ₹ 10 each	₹ 75 lakhs
Income Tax Rate	40%

Required:

i. Determine company's Return on Capital Employed [Pre-tax] and EPS.

ii. Does the company have a favourable financial leverage?

iii. Calculate operating and combined leverages of the company.

iv. Calculate percentage change in EBIT, if sales increases by 10%.

v. At what level of sales, the Earning before Tax [EBT] of the company will be equal to zero?

PROBLEM – 4 [NOV 21]

Information of A Ltd. is given below:

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

(i) From the given data complete following statement:

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

(ii) Calculate Financial Leverage and Combined Leverage.

Calculate the percentage change in earning per share, if sales increased by 5%.

PROBLEM – 5 [JULY 21]

A company had the following balance sheet as on 31st March, 2021:

Liabilities	₹ in Crores	Assets	₹ in Crores
Equity Share Capital [75 lakhs Shares of ₹ 10 each]	7.50	Building	12.50
Reserves and Surplus	1.50	Machinery	6.25
15% Debentures	15.00	Current Assets	
Current Liabilities	6.00	Stock	3.00
		Debtors	3.25
		Bank Balance	5.00
	30.00		30.00

The additional information given is as under:	
Fixed cost per annum [excluding interest]	₹ 6 crores
Variable operating cost ratio	60%
Total assets turnover ratio	2.5
Income-tax rate	40%

Calculate the following and comment:

(i) Earnings per share

(ii) Operating Leverage

(iii) Financial Leverage

(iv) Combined Leverage

PROBLEM – 6 [JAN 21]

The information related to XYZ Company Ltd. for the year ended 31st March, 2020 are as follows:

Equity Share Capital of ₹ 100 each	₹ 50 Lakhs
12% Bonds of ₹ 1000 each	₹ 30 Lakhs
Sales	₹ 84 Lakhs
Fixed Cost [Excluding Interest]	₹ 7.5 Lakhs
Financial Leverage	1.39
Profit-Volume Ratio	25%
Market Price per Equity Share	₹ 200
Income Tax Rate Applicable	30%
You are required to compute the following:	

i. Operating Leverage

ii. Combined Leverage

iii. Earning per share

iv. Earning Yield

PROBLEM – 7 [NOV 20]

The following data is available for Stone Ltd. :

	[₹]
Sales	5,00,000
[-] Variable cost @ 40%	2,00,000
Contribution	3,00,000
[-] Fixed cost	2,00,000
EBIT	1,00,000
[-] Interest	25,000

Profit before tax	75,000

Using the concept of leverage, find out

(i) The percentage change in taxable income if EBIT increases by 10%.

(ii) The percentage change in EBIT if sales increases by 10%.

(iii) The percentage change in taxable income if sales increases by 10%.

Also verify the results in each of the above case.

PROBLEM – 8 [NOV 18]

Following is the Balance Sheet of Soni Ltd. as on 31st March, 2018 :

Liabilities	**Amount in ₹**
Shareholder's Fund	
Equity Share Capital [₹ 10 each]	25,00,000
Reserve and Surplus	5,00,000
Non-Current Liabilities [12 Debentures]	50,00,000
Current Liabilities	20,00,000
Total	1,00,00,000
Assets	Amount in ₹
Non-Current Assets	60,00,000
Current Assets	40,00,000
Total	1,00,00,000

Additional Information:

(i) Variable Cost is 60% of Sales.

(ii) Fixed Cost p.a. excluding interest ₹ 20,00,000.

(iii) Total Asset Turnover Ratio is 5 times.

(iv) Income Tax Rate 25% You are required to:

- **(1)** Prepare Income Statement
- **(2)** Calculate the following and comment:
  - **(a)** Operating Leverage
  - **(b)** Financial Leverage
  - **(c)** Combined Leverage

PROBLEM – 9 [NOV 19]

The Balance Sheet of Gitashree Ltd. is given below:

Liabilities	**[₹]**
Shareholders' fund	
Equity share capital of ₹ 10 each ₹ 1,80,000	

Retained earnings ₹ 60,000	2,40,000
Non-current liabilities 10% debt	2,40,000
Current liabilities	1,20,000
	6,00,000
Assets	
Fixed Assets	4,50,000
Current Assets	1,50,000
	6,00,000

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

Calculate:

(i) **[a]** Degree of Operating leverage.

(b) Degree of Financial leverage.

(c) Degree of Combined leverage.

(ii) Find out EBIT if EPS is [a] ₹ 1 [b] ₹ 2 and [c] ₹ 0.

PART – B: [REVISION TEST PAPERS]

PROBLEM – 10 [RTP - NOV 23]

The capital structure of ABC Ltd. for the year ended 31st March 2022 consisted as follows:

Particulars	Amount in ₹
Equity share capital [face value ₹ 100 each]	20,00,000
10% debentures [₹ 100 each]	20,00,000

During the year 2021-22, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 15 per unit and variable cost at ₹ 10 per unit for both the years. The fixed expenses were at ₹ 2,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.

(b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.

(c) The percentage change in EPS.

PROBLEM – 11 [RTP - MAY 23]

The selected financial data for A, B and C companies for the current year ended 31st March are as follows:

Particulars	A	B	C
Variable Expenses as a % of sales	60	50	40
Interest	₹ 1,00,000	₹ 4,00,000	₹ 6,00,000
Degree of Operating Leverage	4:1	3:1	2.5:1
Degree of Financial Leverage	3:1	5:1	2.5:1
Income Tax Rate	30%	30%	30%

(a) PREPARE income statement for A, B and C companies

(b) COMMENT on the financial position and structure of these companies

PROBLEM – 12 [RTP - NOV 22]

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

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

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

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

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

EBIT of the company is expected to be ₹ 52,00,000 p.a. Considering corporate tax rate @ 40%,

YOU ARE REQUIRED TO-

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

(ii) ASCERTAIN financial leverage in each plan and comment

PROBLEM – 13 [RTP - MAY 22]

Company P and Q are having same earnings before tax. However, the margin of safety of Company P is 0.20 and, for Company Q, is 1.25 times than that of Company P. The interest expense of Company P is ₹ 1,50,000 and, for Company Q, is 1/3rd less than that of Company P. Further, the financial leverage of Company P is 4 and, for Company Q, is 75% of Company P.

Other information is given as below:

Particulars	Company P	Company Q
Profit volume ratio	25%	33.33%
Tax rate	45%	45%

You are required to PREPARE Income Statement for both the companies.

PROBLEM – 14 [RTP - NOV 21]

The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

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

The capital structure of the company as on 31st March, 2021 is as follows:

Particulars	₹
Equity share capital [1,00,000 shares of ₹ 10 each]	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

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

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

(i) Entirely by equity shares of ₹ 10 each at par.

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

(iii) Entirely by 6% debentures of ₹ 100 each at par.

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

PROBLEM – 15 [RTP - MAY 21]

Following information has been extracted from the accounts of newly incorporated Textyl Pvt. Ltd. for the Financial Year 2020-21:

Sales - ₹ 15,00,000

P/V ratio - 70%

Operating Leverage - 1.4 times

Financial Leverage - 1.25 times

Using the concept of leverage, find out and verify in each case:

(i) The percentage change in taxable income if sales increase by 15%.

(ii) The percentage change in EBIT if sales decrease by 10%.

(iii) The percentage change in taxable income if EBIT increase by 15%.

PROBLEM – 16 [RTP - NOV 20]

The capital structure of PS Ltd. for the year ended 31st March, 2020 consisted as follows:

Particulars	Amount in ₹
Equity share capital [face value ₹ 100 each]	10,00,000
10% debentures [₹ 100 each]	10,00,000

During the year 2019-20, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 12 per unit and variable cost at ₹ 8 per unit for both the years. The fixed expenses were at ₹ 2,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

(a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.

(b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.

(c) The percentage change in EPS.

PROBLEM – 17 [RTP - MAY 20]

The following information is related to YZ Company Ltd. for the year ended 31st March, 2020:

Equity share capital [of ₹ 10 each]	₹ 50 lakhs
12% Bonds of ₹ 1,000 each	₹ 37 lakhs
Sales	₹ 84 lakhs
Fixed cost [excluding interest]	₹ 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:

i. Operating Leverage;

ii. Combined leverage; and

iii. Earnings per share.

Show calculations up-to two decimal points.

PROBLEM – 18 [RTP - NOV 19]

The following summarises the percentage changes in operating income, percentage changes in revenues, and betas for four listed firms.

Firm	Change in revenue	Change in operating income	Beta
A Ltd.	35%	22%	1.00
B Ltd.	24%	35%	1.65

C Ltd.	29%	26%	1.15
D Ltd.	32%	30%	1.20

Required:

i. CALCULATE the degree of operating leverage for each of these firms. Comment also.

ii. Use the operating leverage to EXPLAIN why these firms have different beta.

PROBLEM – 19 [RTP - MAY 19]

A Company had the following Balance Sheet as on March 31, 2019:

Equity and Liabilities	[₹ in crore]	Assets	[₹ in crore]
Equity Share Capital		Fixed Assets [Net]	250
[10 crore shares of ₹ 10 each]	100		
Reserves and Surplus	20	Current Assets	150
15% Debentures	200		
Current Liabilities	80		
	400		400

The additional information given is as under:

Fixed Costs per annum [excluding interest]	₹ 80 crores
Variable operating costs ratio	65%
Total Assets turnover ratio	2.5
Income-tax rate	40%

Required:

CALCULATE the following and comment:

[i] Earnings per share

[ii] Operating Leverage

[iii] Financial Leverage

[iv] Combined Leverage.

ANSWERS

1.

i] Operating Leverage [OL] = $\frac{\text{Contribution}}{\text{EBIT}}$ Or, 3.125 = $\frac{\text{Rs.4,25,000}}{\text{EBIT}}$ Or EBIT = ₹ 1,36,000

ii] Degree of Combined Leverage [CL] = $\frac{\%\text{ChangeinEPS}}{\%\text{Changeinsales}} = \frac{100}{40} = 2.5$

iii] Combined Leverage = OL × FL = 3.125 × FL

So, Financial Leverage = 2.5 /3.125 = 0.8

iv] Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}} = \frac{1,36,000}{\text{EBT}} = 0.8$

So, EBT = $\frac{1,36,000}{0.8} = \text{Rs.}1,70,000$

Calculation of EPS of X Ltd

Particulars	[₹]
EBT	1,70,000
Less: Tax [50%]	85,000
EAT	85,000
Preference Dividend	15,000
Net Earnings for Equity Shareholders	70,000
Number of equity shares	2,500
EPS	28

2.

[1] Preparation of Profit – Loss Statement

Working Notes:

1. Post tax interest 5.60%

Tax rate 30%

Pre tax interest rate = [5.6/70] x 100 8%

Loan amount ₹ 1,25,000

Interest amount = 1,25,000 x 8% ₹ 10,000

$$\text{Financial leverage(FL)} = \left(\frac{\text{EBIT}}{\text{EBT}}\right) = \left[\frac{\text{EBIT}}{(\text{EBIT} - \text{Interest})}\right] = \left[\frac{\text{EBIT}}{(\text{EBIT} - 10,000)}\right]$$

$$1.5 = \left[\frac{\text{EBIT}}{(\text{EBIT} - 10,000)}\right]$$

1.5 EBIT -15000 = EBIT

1.5 EBIT – EBIT = 15,000

0.5 EBIT = 15,000

∴ **EBIT = ₹ 30,000**

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

2. Operating Leverage [OL] = Contribution / EBIT

2 = Contribution / 30,000

Contribution = ₹ 60,000

3., Fixed cost = Contribution – Profit

= 60,000 – 30,000 = ₹ **30,000**

4., Sales = Contributio PV R n atio

= 60,000 / 30% = ₹ 2,00,000

5. If PV ratio is 30%, then the variable cost is 70% on sales.

∴ **Variable cost** = 2,00,000 x 70% = ₹ **1,40,000**

Profit – Loss Statement

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

[2] Calculation of no. of Equity shares

Market Price per Share [MPS] = ₹140

Price Earnings Ratio [PER] = 10

WKT,

EPS = = MPS / PER 140 / 10 = ₹ 14

Total earnings [EAT] = ₹ 14,000

∴ No. of Equity Shares = 14,000 / 14 = **1000**

3.

Income Statement

Particulars	**Amount [₹]**
Sales	86,00,000

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

i] **ROCE [Pre-tax]** $= \frac{\text{EBIT}}{\text{Capitalemployed}} \times 100 = \frac{\text{EBIT}}{\text{Equity} + \text{Debt}} \times 100$

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

EPS [PAT/No. of equity shares] **1.168 or ₹ 1.17**

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

iii] Calculation of Operating, Financial and Combined leverages:

Operating Leverage = Contribution / EBIT **=** ₹30,10,000 / ₹20,10,000 = 1.497 [approx.]

Financial Leverage = EBIT / EBIT= ₹20,10,000 /₹14,60,000 = 1.377 [approx.]

Combined Leverage = Contribution / EBT = ₹30,10,000 / ₹14,60,000 = 2.062 [approx.]

Or, = Operating Leverage × Financial Leverage = 1.497 × 1.377 **= 2.06 [approx.]**

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

EBIT will be increased by 1.497 × 10% i.e. 14.97% [approx.]

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

Accordingly, New Sales = ₹ 86,00,000 × [1 - 0.4850]

= ₹ 86,00,000 × 0.515

= ₹ 44,29,000 [approx.]

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

4.

[i] Working Notes

Earning after tax [EAT]is 5% of sales

Income tax is 50%

So, EBT is 10% of Sales

Since Interest Expenses is ₹ 30,000

EBIT = 10% of Sales + ₹30,000 ……. [Equation i]

Now Degree of operating leverage = 4

So, Contribution / EBIT = 4

Or, Contribution = 4 EBIT

Or, Sales – Variable Cost = 4 EBIT

Or, Sales – ₹ 6,00,000 = 4 EBIT …… [Equation ii]

Replacing the value of EBIT of equation [i] in Equation [ii]

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

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

Or, 60% of Sales = ₹ 7,20,000

So, Sales = ₹ 7,20,000 / 60% =₹ **12,00,000**

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

EBIT = ₹ 6,00,000 / 4= ₹ **1,50,000**

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

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

EAT = 50% of ₹ 1,20,000 = ₹ 60,000

Income Statement

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

[ii] Financial Leverage= EBIT / EBT = 1,50,000 / 1,20,000 **= 1.25 times**

Combined Leverage = Operating Leverage × Financial Leverage

= 4 x 1.25 = **5 times**

Or,

Combined Leverage = Contribution / EBIT × EBIT / EBT

Combined Leverage = Contribution / EBT = ₹ 6,00,000 / ₹ 1,20,000 = **5 times**

[iii] Percentage Change in Earnings per share

Combined Leverage = % Change in EPS / % change in Sales = 5 = % change in EPS / 5%

∴ % Change in EPS = 25%

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

5.

Total Assets = ₹ 30 crores

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = 30 × 2.5 = ₹ 75 crores

Computation of Profit after Tax [PAT]

Particulars	[₹ in crores]
Sales	75.00
Less: Variable Operating Cost @ 60%	45.00
Contribution	30.00
Less: Fixed Cost [other than Interest]	6.00
EBIT/PBIT	24.00
Less: Interest on Debentures [15% × 15]	2.25
EBT/PBT	21.75
Less: Tax @ 40%	8.70
EAT/ PAT	13.05

[i] Earnings per Share

EPS = PAT / Number of Equity Shares = 13.05 / 0.75 = ₹ 17.40

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

[ii] Operating Leverage

Operating Leverage = Contribution / EBIT = 30 / 24 = 1.25

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

[iii] Financial Leverage

Financial Leverage = EBIT / PBT = 24 / 21.75 = 1.103

The financial leverage is very comfortable since the debt service obligation is small vis -à-vis EBIT.

[iv] Combined Leverage

Combined Leverage = Contribution / PBT = 30 / 21.75= 1.379

Or,

= Operating Leverage × Financial Leverage

= 1.25 x 1.103 = 1.379

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

6.

1. Profit Volume Ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

So, $25 = \frac{\text{Contribution}}{\text{Rs.84,00,000}} \times 100$

Contribution $= \frac{\text{Rs.84,00,000} \times 25}{100}$ = ₹ 21,00,000

2. Financial leverage = EBIT / EBT

Or, 1.39 =Rs.13,50,000 [as calculated above] / EBT

EBT = ₹ 9,71,223 3.

3. Income Statement

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

[i] Operating Leverage = Contribution / Earnings before interest and tax [EBIT]

= Rs.21,00,000 / Rs.13,50,000 = **1.556** [approx.]

[ii] Combined Leverage = Operating Leverage x Financial Leverage

= 1.556 x 1.39 = **2.163** [approx.] Or, = **2.162** [approx.]

Or, Contribution / EBT = Rs.21,00,000 / Rs.9,71,223 = **2.162** [approx.]

[iii] Earnings per Share [EPS]

EPS = PAT / No. fo shares = Rs.6,79,856 / 50,000 = ₹ **13.597**

[iv] Earning Yield = EPS / market pricex 100 =Rs.13.597 / Rs.200 x 100 = **6.80%** [approx.]

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

7.

[i] Degree of Financial Leverage = EBIT / EBT = ₹1,00,000 / ₹75,000 = 1.333 times

So, If EBIT increases by 10% then Taxable Income [EBT] will be increased by 1.333 × 10 = **13.33% [approx.]**

Verification

Particulars	Amount [₹]
New EBIT after 10% increase [₹ 1,00,000 + 10%]	1,10,000
Less: Interest	25,000
Earnings before Tax after change [EBT]	85,000

Increase in Earnings before Tax = ₹ 85,000 - ₹ 75,000 = ₹ 10,000

So, percentage change in Taxable Income [EBT] = ₹10,000 / ₹75,000 x 100 = 13.333%, hence verified

[ii] Degree of Operating Leverage = = = 3 times C ontribution EBIT 3,00,000 1,00,000 ₹₹

So, if sale is increased by 10% then EBIT will be increased by 3 × 10 = **30%**

Verification

Particulars	Amount [₹]
New Sales after 10% increase [₹ 5,00,000 + 10%]	5,50,000
Less: Variable cost [40% of ₹ 5,50,000]	2,20,000
Contribution	3,30,000
Less: Fixed costs	2,00,000
Earnings before interest and tax after change [EBIT]	1,30,000

Increase in Earnings before interest and tax [EBIT] = ₹ 1,30,000 - ₹ 1,00,000 = ₹ 30,000

So, percentage change in EBIT = ₹30,000 / ₹1,00,000 x 100 = **30%, hence verified.**

[iii] Degree of Combined Leverage = Contribution / EBT = ₹3,00,000 / ₹75,000 = 4 times

So, if sale is increased by 10% then Taxable Income [EBT] will be increased by 4 × 10 = **40%**

Verification

Particulars	Amount [₹]
New Sales after 10% increase [₹ 5,00,000 + 10%]	5,50,000
Less: Variable cost [40% of ₹ 5,50,000]	2,20,000
Contribution	3,30,000
Less: Fixed costs	2,00,000
Earnings before interest and tax [EBIT]	1,30,000
Less: Interest	25,000
Earnings before tax after change [EBT]	1,05,000

Increase in Earnings before tax [EBT] = ₹ 1,05,000 - ₹ 75,000 = ₹ 30,000

So, percentage change in Taxable Income [EBT] = ₹30,000 / ₹75,000 x 100 = 40%, hence verified

8.

Workings:-

Total Assets = ₹ 1 crore

Total Asset Turnover Ratio i.e. Total Sales / Total Assets = 5

Hence, Total Sales = ₹ 1 Crore x 5 = ₹ 5 crore

[1] Income Statement

	[₹ in crore]
Sales	5
Less: Variable cost @ 60%	3
Contribution	2
Less: Fixed cost [other than Interest]	0 .2
EBIT [Earnings before interest and tax]	1.8
Less: Interest on debentures [12% x 50 lakhs]	0 .06
EBT [Earning before tax]	1.74
Less: Tax 25%	0.435
EAT [Earning after tax]	1.305

[2] [a] Operating Leverage

Operating leverage =Contribution / EBIT =2 / 1.8 = 1.11

It indicates fixed cost in cost structure. It indicates sensitivity of earnings before interest and tax [EBIT] to change in sales at a particular level.

[b] Financial Leverage

Financial Leverage = EBIT / EBT=1.8 / 1.74 = 1.03

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

c] Combined Leverage

Combined Leverage = $\frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = 1.11 \times 1.03 = 1.15$

Or =

Contribution / EBT = 2/ 1.74= 1.15

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

The leverages - operating, financial and combined are measures of risk.

9.

Working Notes:

Total Assets = ₹ 6,00,000

Total Asset Turnover Ratio i.e. = Total Sales / Total Assets = 4

Hence, Total Sales = ₹ 6,00,000 x 4 = ₹ 24,00,000

Computation of Profits after Tax [PAT]

Particulars	[₹]
Sales	24,00,000
Less: Variable operating cost @ 60%	14,40,000
Contribution	9,60,000
Less: Fixed operating cost [other than Interest]	2,00,000
EBIT [Earning before interest and tax]	7,60,000
Less: Interest on debt [10% ? 2,40,000]	24,000
EBT [Earning before tax]	7,36,000
Less: Tax 30%	2,20,800
EAT [Earning after tax]	5,15,200

[i] [a] Degree of Operating Leverage

Degree of Operating leverage = Contribution / EBIT

= ₹9,60,000 / ₹7,60,000= 1.263 [approx.]

[b] Degree of Financial Leverage

Degree of Financial Leverage = EBIT / EBT

= ₹9,60,000 / ₹7,60,000 = 1.033 [approx.]

[c] Degree of Combined Leverage

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

= ₹9,60,000 / ₹7,60,000 = 1.304 [approx.]

Or

Degree of Combined Leverage = Degree of Operating Leverage x Degree of Financial Leverage

= 1.263 x 1.033 = 1.304 [approx.]

[ii] [a] If EPS is Re. 1

EPS = [EBIT-Interest][1-tax] / No. of equity shares

Or, 1 = [EBIT- ₹24,000] [1-0.30] / 18,000

Or, EBIT = ₹ 49,714 [approx.]

[b] If EPS is ₹ 2

2 = [EBIT- 24,000] [1-0.30] / 18,000

Or, EBIT = ₹ 75,429 [approx.]

[c] If EPS is ₹ 0

0 = [EBIT- 24,000] [1-0.30] / 18,000

Or, EBIT = ₹ 24,000

Alternatively, if EPS is 0 [zero], EBIT will be equal to interest on debt i.e. ₹ 24,000.

10.

Sales in units	**1,20,000**	**1,00,000**
	[₹]	**[₹]**
Sales Value	18,00,000	15,00,000
Variable Cost	[12,00,000]	[10,00,000]
Contribution	6,00,000	5,00,000
Fixed expenses	[2,00,000]	[2,00,000]
EBIT	4,00,000	3,00,000
Debenture Interest	[2,00,000]	[2,00,000]
EBT	2,00,000	1,00,000
Tax @ 30%	[60,000]	[30,000]
Profit after tax [PAT]	1,40,000	70,000
[i] Financial Leverage= EBIT EBT	= = 2 24,00,000 ,00,000	= = 3 3,00,000 1,00,000
[ii] Operating leverage = Contribution EBIT	= 1.50 46,00,000 ,00,000	= = 1.67 35,00,000 ,00,000
[iii] Earnings per share [EPS]	= ₹ 7 2 1,40,000 0,000	= ₹ 3.5 2 70,000 0,000
Decrease in EPS	= ₹ 7 – ₹ 3.5 = ₹ 3.5	
% decrease in EPS	= x 100 = 50% 3.5 7	

11.

Income Statement of companies A, B and C

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

Working Notes:

[i] Degree of Financial Leverage = EBIT / EBIT - Interest

DFL x [EBIT – Int] = EBIT

DFL x EBIT – Int x DFL= EBIT

DFL x EBIT – EBIT =Int x DFL

EBIT[DFL – 1] = Int x DFL

EBIT = int x DFL / DFL -1

For A,

$EBIT_A$ = ₹1,00,000 x 3 / 3 - 1

$EBIT_A$ = ₹150000

For B

$EBIT_B$ = ₹4,00,000 x 5 / 5 - 1

$EBIT_B$ = ₹500000

For C

EBITc = 6,00,000 x 2.5 / 2.5 - 1

EBITc =10,00,000

[ii] DOL= Contribution / EBIT

Contribution = DOL x EBIT

$Contribution_A$ = 4 x ₹1,50,000

$Contribution_A$ = ₹6,00,000

$Contribution_B$ = 3 x ₹5,00,000

$Contribution_B$ = ₹15,00,000

$Contribution_C$ = 2.5 x ₹10,00,000

$Contribution_C$ = ₹25,00,000

[iii] Fixed Cost = Contribution – EBIT

Fixed $Cost_A$= ₹6,00,000 – ₹1,50,000 = ₹4,50,000

Fixed $Cost_B$ =₹15,00,000 – ₹5,00,000 = ₹10,00,000

Fixed $Cost_C$ = ₹25,00,000 – ₹10,00,000 = ₹15,00,000

[iv] Contribution= Sales – VC

VC= Sales – Contribution

Sales x VC Ratio= Sales – Contribution

Contribution= Sales – Sales x VC Ratio

Contribution=Sales[1-VCR]

Sales = Contribution / 1- VCR

$Sales_A$ = ₹6,00,000/[1-0.6] = ₹15,00,000

$Sales_B$ = ₹15,00,000/[1-0.5] = ₹30,00,000

$Sales_C$ = ₹25,00,000/[1-0.4] = ₹41,66,667

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

12.

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 [EBITEBT]	1.00	1.06	1.07	1.08*

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

$= \left(\frac{52,00,000}{(52,00,000-0)-\left(\frac{2,34,000}{(1-.40)}\right)}\right) = \left(\frac{52,00,000}{48,10,000}\right) = 1.08$

13.

Income Statement

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

Workings:

[i] Margin of Safety

For Company P = 0.20

For Company Q = 0.20 x 1.25 = 0.25

[ii] Interest Expenses

For Company P = ₹ 1,50,000

For Company Q = ₹ 1,50,000 [1-1/3] = ₹ 1,00,000

[iii] Financial Leverage

For Company P = 4

For Company Q = 4 x 75% = 3

[iv] EBIT

For Company A

Financial Leverage = EBIT/[EBIT- Interest]

4 = EBIT/[EBIT- ₹ 1,50,000]

4EBIT – ₹ 6,00,000 = EBIT

3EBIT = ₹ 6,00,000

EBIT = ₹ 2,00,000

For Company B

Financial Leverage = EBIT/[EBIT - Interest]

3 = EBIT/[EBIT – ₹ 1,00,000]

3EBIT – ₹ 3,00,000 = EBIT

2EBIT = ₹ 3,00,000

EBIT = ₹ 1,50,000

[v] Contribution

For Company A

Operating Leverage = 1/Margin of Safety

= 1/0.20 = 5

Operating Leverage = Contribution/EBIT

5 = Contribution/₹ 2,00,000

Contribution = ₹ 10,00,000

For Company B

Operating Leverage = 1/Margin of Safety

= 1/0.25 = 4

Operating Leverage = Contribution/EBIT

4 = Contribution/₹ 1,50,000

Contribution = ₹ 6,00,000

[vi] Sales

For Company A

Profit Volume Ratio = 25%

Profit Volume Ratio = Contribution/Sales × 100

25% = ₹ 10,00,000/Sales

Sales = ₹ 10,00,000/25%

Sales = ₹ 40,00,000

For Company B

Profit Volume Ratio = 33.33%

Therefore, Sales = ₹ 6,00,000/33.33%

Sales = ₹ 18,00,000

14.

Statement showing Profitability of Alternative Schemes for Financing

[₹ in '00,000]

Particulars	**Existing**	**Alternative Schemes**		
		[i]	**[ii]**	**[iii]**
Equity Share capital [existing]	10	10	10	10
New issues	-	10	5	-
10	**20**	**15**		**10**
7% debentures	10	10	10	10
6% debentures	-	-	5	10
20	**30**	**30**		**30**
Debenture interest [7%]	0.7	0.7	0.7	0.7
Debenture interest [6%]	-	-	0.3	0.6
0.7	**0.7**	**1.0**		**1.3**
Output [units in lakh]	1	1.5	1.5	1.5

Contribution per. unit [₹] [Selling price - Variable Cost]	**20**	**22**	**22**	**22**
Contribution [₹ lakh]	**20**	**33**	**33**	**33**
Less: Fixed cost	10	15	15	15
EBIT	**10**	**18**	**18**	**18**
Less: Interest [as calculated above]	0.7	0.7	1.0	1.3
EBT	**9.3**	**17.3**	**17**	**16.7**
Less: Tax [40%]	3.72	6.92	6.8	6.68
EAT	**5.58**	**10.38**	**10.20**	**10.02**
Operating Leverage [Contribution /EBIT]	**2.00**	**1.83**	**1.83**	**1.83**
Financial Leverage [EBIT/EBT]	**1.08**	**1.04**	**1.06**	**1.08**
Combined Leverage [Contribution/EBT]	**2.15**	**1.91**	**1.94**	**1.98**
EPS [EAT/No. of shares] [₹]	**5.58**	**5.19**	**6.80**	**10.02**
Risk	**-**	**Lowest**	**Lower than option [3]**	**Highest**
Return	**-**	**Lowest**	**Lower than option [3]**	**Highest**

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

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

15.

Workings:

1. Contribution = Sales x P/V ratio

= ₹ 15,00,000 x 70% = ₹ 10,50,000

2. Operating Leverage = Contribution / Earnings before interest and tax [EBIT]

Or, 1.4 = ₹ 10,50,000 / EBIT

EBIT = ₹ 7,50,000

3. Financial leverage = EBIT EBT

Or, 1.25 = EBT ₹ 7,50,000

EBT = ₹ 6,00,000

4. Fixed Cost = Contribution – EBIT

= ₹ 10,50,000 – ₹ 7,50,000 = ₹ 3,00,000

5. Interest = EBIT – EBT

= ₹ 7,50,000 – ₹ 6,00,000 = ₹ 1,50,000

6. Income Statement

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

[i] Combined Leverage = Contribution/ EBT = ₹10,50,000/ ₹6,00,000 = 1.75 times

Or, Combined Leverage = Operating Leverage x Financial Leverage

= 1.4 x 1.25 = **1.75 times**

So, if sales is increased by 15% then taxable income [EBT] will be increased by 1.75 × 15% = **26.25%**

Verification

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

Increase in Earnings before tax [EBT] = ₹ 7,57,500 - ₹ 6,00,000 = ₹ 1,57,500

So, percentage change in Taxable Income [EBT] = ₹ 1,57,500 ₹ 6,00,000 × 100 = **26.25%, hence verified.**

[ii] Degree of Operating Leverage [Given] = **1.4 times**

So, if sales is decreased by 10% then EBIT will be decreased by 1.4 × 10% = **14%**

Verification

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

Decrease in Earnings before interest and tax [EBIT] = ₹ 7,50,000 - ₹ 6,45,000 = ₹ 1,05,000

So, percentage change in EBIT = hence verified. ₹1,05,000 / ₹7,50,000 x 100 = 14%,

[iii] Degree of Financial Leverage [Given] = **1.25 times**

So, if EBIT increases by 15% then Taxable Income [EBT] will be increased by 1.25 × 15% = **18.75%**

Verification

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

Increase in Earnings before Tax = ₹ 7,12,500 - ₹ 6,00,000 = ₹ 1,12,500

So, percentage change in Taxable Income [EBT] = ₹1,12,500 / ₹6,00,000 x 100= **18.75%, hence verified.**

16.

Sales in units	**1,20,000**	**1,00,000**
	[₹]	**[₹]**
Sales Value	14,40,000	12,00,000
Variable Cost	[9,60,000]	[8,00,000]
Contribution	4,80,000 4,00,000	
Fixed expenses	[2,00,000]	[2,00,000]
EBIT	2,80,000	2,00,000
Debenture Interest	[1,00,000]	[1,00,000]
EBT	1,80,000	1,00,000
Tax @ 30%	[54,000]	[30,000]
Profit after tax [PAT]	1,26,000	70,000
[i] Financial Leverage= EBIT / EBT	= 1 ,80,000 / 2 ,80,000 = 1.56	= 2 ,00,000 / 1 ,00,000 = 2
[ii] Operating leverage = Contribution/ EBIT	= 4 ,80,000 / 2 ,80,000 = 1.71	= 4 ,00,000 / 2,00,000 = 2
[iii] Earnings per share [EPS]	= ₹1,26,000 / ₹1 0,000 = ₹ 12.6	= ₹7 0,000 / ₹1 0,000 = ₹ 7
Decrease in EPS = % decrease in EPS	= ₹12.6 - ₹ 7 = ₹5.6 5.6 / 12.6 x 100 = 44.44%	

17.

Computation of Profits after Tax [PAT]

Particulars	Amount [₹]
Sales	84,00,000
Contribution [Sales × P/V ratio]	23,14,200
Less: Fixed cost [excluding Interest]	[6,96,000]
EBIT [Earnings before interest and tax]	16,18,200
Less: Interest on debentures [12% ₹37 lakhs]	[4,44,000]
Less: Other fixed Interest [balancing figure]	[88,160]
EBT [Earnings before tax]	10,86,040*
Less: Tax @ 40%	4,34,416
PAT [Profit after tax]	6,51,624

[i] Operating Leverage:

= Contribution / EBIT = ₹23,14,200 / 16,18,200 = 1.43

[ii] Combined Leverage:

= Operating Leverage × Financial Leverage

= 1.43 x 1.49 = 2.13

Or,

Combined Leverage = Contribution / EBIT × EBIT / EBT

Combined Leverage = Contribution / EBT = ₹23,14,200 / ₹10,86,040= 2.13

*Financial Leverage = EBIT / EBT = ₹16,18,200/ EBT ₹= 1.49

So, EBT = ₹16,18,200 / 1.49 = ₹10,86,040

Accordingly, other fixed interest

₹ 16,18,200 - ₹ 10,86,040 - ₹ 4,44,000 = ₹ 88,160

[iii] Earnings per share [EPS]:

= PAT / No.ofsharesoutstanding = ₹ 6,51,624 / 5,00,000 equity shares = ₹ 1.30

18.

[i] Degree of operating leverage = % Change in Operating income / % Change in Revenues

A Ltd. = 0.22 / 0.35 = 0.63

B Ltd. = 0.35 / 0.24 = 1.46

C Ltd. = 0.26 / 0.29 = 0.90

D Ltd. = 0.30 / 0.32 = 0.94

It is level specific.

[ii] High operating leverage leads to high beta. So when operating leverage is lowest i.e. 0.63, Beta is minimum [1] and when operating leverage is maximum i.e. 1.46, beta is highest i.e. 1.65

19.

Total Assets = ₹ 400 crores

Asset Turnover Ratio = 2.5

Hence, Total Sales = 400 × 2.5 = ₹ 1,000 crores

Computation of Profits after Tax [PAT]

	[₹ in crore]
Sales	1,000
Less: Variable operating cost [65% of ₹1,000 crore]	[650]
Contribution	350
Less: Fixed cost [other than Interest]	[80]
EBIT	270
Less: Interest on debentures [15% × ₹200 crore]	[30]
EBT	240
Less: Tax 40%	[96]
EAT [earnings available to equity share holders]	144

[i] Earnings per share [EPS]

∴ EPS = ₹144 crores / 10 crore equity shares = ₹ 14.40

[ii] Operating Leverage

Operating leverage = Contribution / EBIT = 350 / 270 = 1.296

It indicates sensitivity of earnings before interest and tax [EBIT] to change in sales at a particular level.

[iii] Financial Leverage

Financial Leverage = EBIT / EBT = 270 / 240 =1.125

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

[iv] Combined Leverage

Combined Leverage = Contribution / EBIT x EBIT / EBT

Or, Operating Leverage × Financial Leverage = 1.296 x 1.125 = 1.458

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

CHAPTER 3: CAPITAL STRUCTURE

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

The following information pertains to CIZA Ltd.:

	₹
Capital Structure:	
Equity share capital [₹ 10 each]	8,00,000
Retained earnings	20,00,000
9% Preference share capital [₹ 100 each]	12,00,000
12% Long-term loan	10,00,000
Interest coverage ratio	8
Income tax rate	30%
Price – earnings ratio	25

The company is proposed to take up an expansion plan, which requires an additional investment of ₹ 34,50,000. Due to this proposed expansion, earnings before interest and taxes of the company will increase by ₹ 6,15,000 per annum. The additional fund can be raised in following manner:

- By issue of equity shares at present market price, or
- By borrowing 16% Long-term loans from bank.

You are informed that Debt-equity ratio [Debt/ Shareholders' fund] in the range of 50% to 80% will bring down the price-earnings ratio to 22 whereas; Debt-equity ratio over 80% will bring down the price-earnings ratio to 18.

Required:

Advise which option is most suitable to raise additional capital so that the Market Price per Share [MPS] is maximized.

PROBLEM – 2 [NOV 22]

The following are the costs and values for the firms A and B according to the traditional approach.

	Firm A	Firm B
Total value of firm, V [in ₹]	50,000	60,000
Market value of debt, D [in ₹]	0	30,000
Market value of equity, E [in ₹]	50,000	30,000
Expected net operating income [in ₹]	5,000	5,000
Cost of debt [in ₹]	0	1,800
Net Income [in ₹]	5,000	3,200
Cost of equity, Ke = NI/V	10.00%	10.70%

i. Compute the Equilibrium value for Firm A and B in accordance with the M-M approach. Assume that [a] taxes do not exist and [b] the equilibrium value of Ke is 9.09%.

ii. Compute Value of Equity and Cost of Equity for both the firms.

PROBLEM – 3 [MAY 22]

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

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

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

Particulars	Amount in ₹
Equity share capital [1,00,000 shares of ₹ 10 each]	10,00,000
Reserves and surplus	5,00,000
Current liabilities	5,00,000
Total	20,00,000

Raj Ltd. has decided to undertake an expansion project to use the market potential that will involve ₹20 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 15%. The additional output can be sold at the existing selling price without any adverse impact on the market.

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

		[Amount in ₹]
Alternative	Debt	Equity Shares
1	5,00,000	Balance
2	10,00,000	Balance
3	14,00,000	Balance

Current market price per share is ₹ 200.

Slab wise interest rate for fund borrowed is as follows:

Fund limit	Applicable interest rate
Up-to ₹ 5,00,000	10%
Over₹ 5,00,000 and up-to ₹ 10,00,000	15%
Over ₹ 10,00,000	20%

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

PROBLEM – 4 [NOV 21]

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

It can raise fund either through debts at rate of 12% p.a. or by issuing Equity shares at par. Tax rate is 40%.

Required:

Compute the earning per share if:

(i) The additional funds were raised through debts.

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

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

PROBLEM – 5 [JULY 21]

The details about two companies R Ltd. and S Ltd. having same operating risk are given below:

Particulars	R Ltd.	S Ltd.
Profit before interest and tax	₹ 10 lakhs	₹ 10 lakhs
Equity share capital ₹ 10 each	₹ 17 lakhs	₹ 50 lakhs
Long term borrowings @ 10%	₹ 33 lakhs	-
Cost of Equity [Ke]	18%	15%

You are required to:

(1) Calculate the value of equity of both the companies on the basis of M.M. Approach without tax.

(2) Calculate the Total Value of both the companies on the basis of M.M. Approach without tax.

PROBLEM – 6 [JAN 21]

A Limited and B Limited are identical except for capital structures. A Ltd. has 60 per cent debt and 40 per cent equity, whereas B Ltd. has 20 per cent debt and 80 per cent equity. [All percentages are in market-value terms.] The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) [i] If X, owns 3 per cent of the equity shares of A Ltd., determine his return i f the Company has net operating income of ₹ 4,50,000 and the overall capitalization rate of the company, [Ko] is 18 per cent.

[ii] Calculate the implied required rate of return on equity of A Ltd.

(b) B Ltd. has the same net operating income as A Ltd.

(i) Calculate the implied required equity return of B Ltd

(ii) Analyse why does it differ from that of A Ltd.

PROBLEM – 7 [NOV 20]

J Ltd. is considering three financing plans. The-key information is as follows:

(a) Total investment to be raised ₹ 4,00,000.

(b) Plans showing the Financing Proportion:

Plans	Equity	Debt	Preference Shares
X	100%	-	-
Y	50%	50%	-
Z	50%	-	50%

(c) Cost of Debt 10%

(d) Cost of preference shares 10%

(e) Tax Rate 50%

(f) Equity shares of the face value

(g) Expected EBIT is ₹ 1,00,000 of ₹10 each will be issued at a premium of ₹ 10 per share.

You are required to compute the following for each plan :

(i) Earnings per share [EPS]

(ii) Financial break even point

(iii) Indifference Point between the plans and indicate if any of the plans dominate.

PROBLEM – 8 [NOV 18]

Y Limited requires ₹ 50,00,000 for a new project. This project is expected to yield earnings before interest and taxes of ₹ 10,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per' share. It has two alternatives to finance the project - by raising debt ₹ 5,00,000 or ₹ 20,00,000 and the balance, in each case, by issuing Equity Shares. The company's share is currently selling at ₹ 300, but is expected to decline to ₹ 250 in case the funds are borrowed in excess of ₹ 20,00,000. The funds can be borrowed at the rate of 12 percent upto ₹ 5,00,000 and at 10 percent over ₹ 5,00,000. The tax rate applicable to the company is 25 percent.

Which form of financing should the company choose?

PART – B: [REVISION TEST PAPERS]

PROBLEM – 9 [RTP - NOV 23]

Prakash Limited provides you the following information:

	[₹]
Profit [EBIT]	3,00,000
Less: Interest on Debenture @ 10%	[50,000]

EBT	2,50,000
Less Income Tax @ 50%	[1,25,000]
	1,25,000
No. of Equity Shares [₹ 10 each]	25,000
Earnings per share [EPS]	5
Price /EPS [PE] Ratio	10

The company has reserves and surplus of ₹ 7,50,000 and required ₹ 5,00,000 further for modernisation. Return on Capital Employed [ROCE] is constant. Debt [Debt/ Debt + Equity] Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ASCERTAIN the probable price of the share.

(i) If the additional capital is raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price

PROBLEM – 10 [RTP - MAY 23]

Current Capital Structure of XYZ Ltd is as follows:

Equity Share Capital of 7 lakh shares of face value ₹ 20 each

Reserves of ₹ 10,00,000

9% bonds of ₹ 3,00,00,000

11% preference capital: 3,00,000 shares of face value ₹ 5 each

Additional Funds required for XYZ Ltd are ₹ 5,00,00,000.

XYZ Ltd is evaluating the following alternatives:

I. Proposed alternative I: Raise the funds via 25% equity capital and 75% debt at 10%. PE ratio in such scenario would be 12.

II. Proposed alternative II: Raise the funds via 50% equity capital and rest from 12% Preference capital .PE ratio in such scenario would be 11.

Any new equity capital would be issued at a face value of ₹ 20 each. Any new preferential capital would be issued at a face value of ₹ 20 each. Tax rate is 34%

DETERMINE the indifference point under both the alternatives.

PROBLEM – 11 [RTP - NOV 22]

ABC Limited provides you the following information:

	[₹]
Profit [EBIT]	2,80,000
Less: Int 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.

PROBLEM – 12 [RTP - MAY 22]

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

Particulars	Bee Ltd.	Cee Ltd.
12% Debt	₹ 27,00,000	-
Equity Capitalization Rate	-	18
Expected Net Operating Income	₹ 9,00,000	₹ 9,00,000

You are required to:

(a) DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.

(b) DETERMINE the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

PROBLEM – 13 [RTP - NOV 21]

Blue Ltd., an all equity financed company is considering the repurchase of ₹ 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is ₹ 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes [EBIT] are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller [MM] Approach:

(i) Market value of the company

(ii) Overall Cost of capital

(iii) Cost of equity

PROBLEM – 14 [RTP - MAY 21]

Zordon Ltd. has net operating income of ₹ 5,00,000 and total capitalization of ₹ 50,00,000 during the current year. The company is contemplating to introduce debt financing in capital structure and has various options for the same. The following information is available at different levels of debt value:

Debt value [₹]	Interest rate [%]	Equity capitalization rate [%]
0	-	10.00
5,00,000	6.0	10.50
10,00,000	6.0	11.00
15,00,000	6.2	11.30
20,00,000	7.0	12.40
25,00,000	7.5	13.50
30,00,000	8.0	16.00

Assuming no tax and that the firm always maintains books at book values, you are REQUIRED to calculate:

(i) Amount of debt to be employed by firm as per traditional approach.

(ii) Equity capitalization rate, if MM approach is followed.

PROBLEM – 15 [RTP - NOV 20]

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

Particulars	Plan – A [₹]	Plan – B [₹]
Equity shares of ₹ 10 each	8,00,000	8,00,000
Preference Shares of ₹ 100 each	-	4,00,000
12% Debentures	4,00,000	-
	12,00,000	12,00,000

The indifference point between the plans is ₹ 4,80,000. Corporate tax rate is 30%.

CALCULATE the rate of dividend on preference shares.

PROBLEM – 16 [RTP - MAY 20]

CALCULATE the level of earnings before interest and tax [EBIT] at which the EPS indifference point between the following financing alternatives will occur.

Equity share capital of ₹60,00,000 and 12% debentures of ₹40,00,000.

Or

Equity share capital of ₹40,00,000, 14% preference share capital of ₹20,00,000 and 12% debentures of ₹40,00,000.

Assume the corporate tax rate is 35% and par value of equity share is ₹100 in each case.

PROBLEM – 17 [RTP - NOV 19]

The management of RT Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

Proposal	Equity shares [%]	Debts [%]	Preference shares [%]
P	100	-	-
Q	50	50	-
R	50	-	50

(i) Cost of debt and preference shares is 12% each.

(ii) Tax rate –40%

(iii) Equity shares of the face value of ₹10 each will be issued at a premium of ₹10 per share.

(iv) Total investment to be raised ₹8,00,00,000.

(v) Expected earnings before interest and tax ₹3,60,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point

COMPUTE the EBIT range among the plans for indifference.

PROBLEM – 18 [RTP - MAY 19]

Akash Limited provides you the following information:

	[₹]
Profit [EBIT]	2,80,000
Less: Interest on Debenture @ 10%	[40,000]
EBT	2,40,000
Less Income Tax @ 50%	[1,20,000]
	1,20,000
No. of Equity Shares [₹ 10 each]	30,000
Earnings per share [EPS]	4
Price /EPS [PE] Ratio	10

The company has reserves and surplus of ₹ 7,00,000 and required ₹ 4,00,000 further for modernisation. Return on Capital Employed [ROCE] is constant. Debt [Debt/ Debt + Equity] Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ASCERTAIN the probable price of the share.

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

(ii) If the amount is raised by issuing equity shares at ruling market price.

ANSWERS

1.

Working notes:

[i] Interest Coverage ratio = 8

EBIT / Interest = 8

EBIT / 1,20,000 = 8

So, EBIT = ₹ 9,60,000

[ii] Proposed Earnings Before Interest & Tax = 9,60,000 + 6,15,000 = ₹ 15,75,000

Option 1: Equity option

Debt = ₹ 10,00,000

Shareholders Fund = 8,00,000+20,00,000+12,00,000+34,50,000 = ₹ 74,50,000

Debt Equity ratio[Debt/Shareholders fund] = 10,00,000 / 74,50,000 = 13.42%

P/E ratio in this case will be 25 times

Option 2: Debt option

Debt = 10,00,000 + 34,50,000 = ₹ 44,50,000

Shareholders Fund = 8,00,000+20,00,000+12,00,000 = ₹ 40,00,000

Debt Equity ratio[Debt/Shareholders fund] = 44,50,000 / 40,00,000 = 111.25%

Debt equity ratio has crossed the limit of 80% hence PE ratio in this case will remain at 18 times.

Number of Equity Shares to be issued = ₹ 34,50,000/ ₹ 150 = 23,000

[iii] Calculation of Earnings per Share and Market Price per share

Particulars	₹
Current Earnings Before Interest & Tax	9,60,000
Less: Interest	1,20,000
Earnings Before Tax	8,40,000
Less: Taxes	2,52,000
Earnings After Tax	5,88,000
Less: Preference Dividend [@9%]	1,08,000
Net earnings for Equity shareholders	4,80,000
Number of equity shares	80,000
Earnings Per Share	6
Price-earnings ratio	25
Market Price per share	150

Calculation of EPS and MPS under two financial options

Particulars	Financial Options

	Option I Equity Shares Issued [₹]	Option II 16% Long Term Debt Raised [₹]
Earnings before interest and Tax [EBIT]	15,75,000	15,75,000
Less: Interest on old debentures @ 12%	1,20,000	1,20,000
Less: Interest on additional loan [new] @ 16% on ₹ 34,50,000	NIL	5,52,000
Earnings before tax	14,55,000	9,03,000
Less: Taxes @ 30%	4,36,500	2,70,900
[EAT/Profit after tax]	**10,18,500**	**6,32,100**
Less: Preference Dividend [@9%]	1,08,000	1,08,000
Net Earnings available to Equity shareholders	**9,10,500**	**5,24,100**
Number of Equity Shares	1,03,000	80,000
Earnings per Share [EPS]	**8.84**	**6.55**
Price/ Earnings ratio	25	18
Market price per share [MPS]	**221**	**117.9**

Advise: Equity option has higher Market Price per Share therefore company should raise additional fund through equity option.

2.

[i] Computation of Equilibrium value of Firms A & B under MM Approach:

As per MM approach KO is equal to Keu

$\therefore K_O = K_{eu} [1 - t] = 9.09 [1 - 0] = 9.09$

Particulars	A	B
EBIT [NOI] [₹]	5000	5000
KO [%]	9.09	9.09
Equilibrium value [₹] [NOI/Ko] X 100	55005.5 $\frac{5,000}{9.09}\times 100$	55005.5 $\frac{5,000}{9.09}\times 100$

[ii] Computation of value of equity and cost of equity of Firms A & B

Particulars	A	B
Equilibrium value [₹]	55,005.5	55,005.5
Less: Value of Debt	-	30,000
Value of Equity	55,005.5	25,005.5

Cost of Equity of Firm A [unlevered] = 9.09

Cost of Debt of Firm B [Kd] [levered] = [1800/30000] x 100 = 6%

Cost of Equity of Firm B [Levered] = $K_O + [K_O - K_d]$ x [Debt / Equity]

= 9.09 + [9.09 – 6] x [30000/25005.5]

= 9.09 + 3.09 x 1.2 = 9.09 + 3.71 = **12.80%**

[OR]

Cost of Equity of Firm B [Levered] = $\left(\frac{NI}{Value of Equity}\right) \times 100$ =

= $\left(\frac{3200}{25005.5}\right) \times 100 = 12.8\%$

3.

Alternative 1 = Raising Debt of ₹ 5 lakh + Equity of ₹ 15 lakh

Alternative 2 = Raising Debt of ₹ 10 lakh + Equity of ₹ 10 lakh

Alternative 3 = Raising Debt of ₹ 14 lakh + Equity of ₹ 6 lakh

Calculation of Earnings per share [EPS]

Particulars	**FINANCIAL ALTERNATIVES**		
	Alternative 1	**Alternative 2**	**Alternative 3**
	[₹]	**[₹]**	**[₹]**
Expected EBIT [W. N. [a]]	19,50,000	19,50,000	19,50,000
Less: Interest [W. N. [b]]	[50,000]	[1,25,000]	[2,05,000]
Earnings before taxes [EBT]	**19,00,000**	**18,25,000**	**17,45,000**
Less: Taxes @ 40%	7,60,000	7,30,000	6,98,000
Earnings after taxes [EAT]	11,40,000	10,95,000	10,47,000
Number of shares [W. N. [d]]	1,07,500	1,05,000	1,03,000
Earnings per share [EPS]	10.60	10.43	10.17

Conclusion: Alternative 1 [i.e. Raising Debt of ₹ 5 lakh and Equity of ₹ 15 lakh] is recommended which maximises the earnings per share.

Working Notes [W.N.]:

[a] Calculation of Earnings before Interest and Tax [EBIT]

Particulars	
Output [1,00,000 + 50%] [A]	1,50,000
Selling price per unit	₹ 40
Less: Variable cost per unit [₹ 20 – 15%]	₹ 17
Contribution per unit [B]	₹ 23
Total contribution [A x B]	₹ 34,50,000
Less: Fixed Cost [₹ 10,00,000 + ₹ 5,00,000]	₹ 15,00,000
EBIT	₹ 19,50,000

[b] Calculation of interest on Debt

Alternative		[₹]	Total [₹]
1	[₹ 5,00,000 x 10%]		50,000
2	[₹ 5,00,000 x 10%]	50,000	1,25,000
	[₹ 5,00,000 x 15%]	75,000	
3	[₹ 5,00,000 x 10%]	50,000	2,05,000
	[₹ 5,00,000 x 15%]	75,000	
	[₹ 4,00,000 x 20%]	80,000	

[c] Number of equity shares to be issued

$$\text{Alternative 1} = \frac{\text{Rs.}(20,00,000-5,00,000)}{\text{Rs.200(marketpriceofshare}} = \frac{\text{Rs.}15,00,000}{\text{Rs.}200} = 7,500\text{shares}$$

$$\text{Alternative 2} = \frac{\text{Rs.}(20,00,000-10,00,000)}{\text{Rs.200(marketpriceofshare}} = \frac{\text{Rs.}10,00,000}{\text{Rs.}200} = 5,000\text{shares}$$

$$\text{Alternative 3} = \frac{\text{Rs.}(20,00,000-14,00,000)}{\text{Rs.200(marketpriceofshare}} = \frac{\text{Rs.}6,00,000}{\text{Rs.}200} = 3,000\text{shares}$$

[d] Calculation of total equity shares after expansion program

	Alternative 1	**Alternative 2**	**Alternative 3**
Existing no. of shares	1,00,000	1,00,000	1,00,000
Add: issued under expansion program	7,500	5,000	3,000
Total no. of equity shares	**1,07,500**	**1,05,000**	**1,03,000**

4.

Working Notes:

[1] Capital employed before expansion plan:

	[₹]
Equity shares [₹ 10 × 80,000 shares]	8,00,000
Debentures {[₹ 1,20,000/12] ⍰ 100}	10,00,000
Retained earnings	12,00,000
Total capital employed	**30,00,000**

[2] Earnings before interest and tax [EBIT] = 4,50,000

[3] Return on Capital Employed [ROCE]:

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capitalemployed}} \times 100 = \frac{\text{Rs.}4,50,000}{\text{Rs.}30,00,000} \times 100 = 15\%$$

[4] Earnings before interest and tax [EBIT] after expansion scheme:

After expansion, capital employed = ₹ 30,00,000 + ₹ 6,00,000 = ₹ 36,00,000

Desired EBIT = 15% x₹ 36,00,000 = ₹ **5,40,000**

i] & [ii] Computation of Earnings Per Share [EPS] under the following options:

	Present situation	Expansion scheme Additional funds raised as	
		Debt [i]	Equity [ii]
	[₹]	[₹]	[₹]
Earnings before Interest and Tax [EBIT]	4,50,000	5,40,000	5,40,000
Less: Interest - Old Debt	1,20,000	1,20,000	1,20,000
- New Debt	--	**72,000** [₹ 6,00,000 x 12%]	--
Earnings before Tax [EBT]	3,30,000	3,48,000	4,20,000
Less: Tax [40% of EBT]	1,32,000	1,39,200	1,68,000
PAT/EAT	1,98,000	**2,08,800**	**2,52,000**
No. of shares outstanding	80,000	80,000	1,40,000
Earnings per Share [EPS]	2.475 [₹ 1,98,000 / 80,000]	**2.610** [₹2,08,800 / 80,000]	**1.800** [₹2,52,000 / 1,40,000]

Advise to the Company: When the expansion scheme is financed by additional debt, the EPS is higher. Hence, the company **should finance the expansion** scheme by **raising debt**.

5.

[1] Computation of value of equity on the basis of MM approach without tax

Particulars	R Ltd. [₹ in lakhs]	S Ltd. [₹ in lakhs]
Profit before interest and taxes	10	10
Less: Interest on debt [10% × ₹ 33,00,000]	3.3	-
Earnings available to Equity shareholders	6.7	10
Ke	18%	15%
Value of Equity [Earnings available to Equity shareholders/Ke]	**37.222**	**66.667**

[2] Computation of total value on the basis of MM approach without tax

Particulars	R Ltd. [₹ in lakhs]	S Ltd. [₹ in lakhs]
Value of Equity [S] [as calculated above]	37.222	66.667
Debt [D]	33	-
Value of Firm [V] = S + D	**70.222**	**66.667**

6.

[a] Value of A Ltd. =NOI / K_o =Rs.4,50,000 / 18% = ₹ 25,00,000

[i] Return on Shares of X on A Ltd.

Particulars	Amount [₹]
Value of the company	25,00,000
Market value of debt [60% x ₹ 25,00,000]	15,00,000
Market value of shares [40% x ₹ 25,00,000]	10,00,000
Particulars	**Amount [₹]**
Net operating income	4,50,000
Interest on debt [8% × ₹ 15,00,000]	1,20,000
Earnings available to shareholders	3,30,000
Return on 3% shares [3% × ₹ 3,30,000]	9,900

[ii] Implied required rate of return on equity of A Ltd. = ₹3,30,000 / 10,00,000 = 33%

[b] [i] Calculation of Implied rate of return of B Ltd

Particulars	Amount [₹]
Total value of company	25,00,000
Market value of debt [20% × ₹ 25,00,000]	5,00,000
Market value of equity [80% × ₹ 25,00,000]	20,00,000
Particulars	**Amount [₹]**
Net operating income	4,50,000
Interest on debt [8% × ₹ 5,00,000]	40,000
Earnings available to shareholders	4,10,000

Implied required rate of return on equity = ₹4,10,000 / ₹20,00,000 = 20.5%

[ii] Implied required rate of return on equity of B Ltd. is lower than that of A Ltd. because B Ltd. uses less debt in its capital structure. As the equity capitalisation is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of "cheaper" debt funds.

7.

[i] Computation of Earnings per Share [EPS]

Plans	X [₹]	Y [₹]	Z [₹]
Earnings before interest & tax [EBIT]	1,00,000	1,00,000	1,00,000
Less: Interest charges [10% of ₹ 2,00,000]	--	[20,000]	--
Earnings before tax [EBT]	1,00,000	80,000	1,00,000
Less: Tax @ 50%	[50,000]	[40,000]	[50,000]
Earnings after tax [EAT]	50,000	40,000	50,000

Less: Preference share dividend [10% of ₹2,00,000]	--	--	[20,000]
Earnings available for equity shareholders [A]	50,000	40,000	30,000
No. of equity shares [B] Plan X = ₹ 4,00,000/ ₹ 20 Plan Y = ₹ 2,00,000 / ₹ 20 Plan Z = ₹ 2,00,000 / ₹ 20	20,000	10,000	10,000
E.P.S [AB]	**2.5**	**4**	**3**

[ii] Computation of Financial Break-even Points

Financial Break-even point = Interest + Preference dividend/[1 - tax rate]

Proposal 'X' = 0

Proposal 'Y' = ₹ **20,000** [Interest charges]

Proposal 'Z' = Earnings required for payment of preference share dividend = ₹ 20,000 ÷ [1- 0.5 Tax Rate] = ₹ **40,000**

[iii] Computation of Indifference Point between the plans

Combination of Proposals

[a] Indifference point where EBIT of proposal "X" and proposal 'Y' is equal

= [EBIT][1-0.5] / 20,000 shares = [EBIT- ₹20,000][1-0.5] / 10,000 shares

0.5 EBIT = EBIT – ₹ 20,000

EBIT = ₹ **40,000**

[b] Indifference point where EBIT of proposal 'X' and proposal 'Z' is equal:

= [EBIT][1-0.5] / 20,000 shares = EBIT[1-0.5] - ₹20,000 / 10,000 shares

0.5 EBIT = EBIT- ₹ 40,000

0.5 EBIT = ₹ 40,000

EBIT = = ₹ 80,000 40,000 0.5 ₹

[c] Indifference point where EBIT of proposal 'Y' and proposal 'Z' are equal

= [EBIT- 20,000][1-0.5] / 10,000 shares = ₹ EBIT[1-0.5] - 20,000 / 10,000 shares ₹

0.5 EBIT – ₹ 10,000 = 0.5 EBIT – ₹ 20,000

There is no indifference point between proposal 'Y' and proposal 'Z'

Analysis: It can be seen that financial proposal 'Y' dominates proposal 'Z'**,** since the financial break-even-point of the former is only ₹ 20,000 but in case of latter, it is ₹ 40,000. EPS of plan 'Y' is also higher**.**

8.

Plan I = Raising Debt of Rs 5 lakh + Equity of Rs 45 lakh.

Plan II = Raising Debt of ₹ 20 lakh + Equity of ₹ 30 lakh.

Calculation of Earnings per share [EPS]

Particulars	Financial Plans	
	Plan I	Plan II
	₹	₹
Expected EBIT	10,00,000	10,00,000
Less: Interest [Working Note 1]	[60,000]	[2,10,000]
Earnings before taxes	9,40,000	7,90,000
Less: Taxes @ 25%	[2,35,000]	[1,97,500]
Earnings after taxes [EAT]	7,05,000	5,92,500
Number of shares [Working Note 2]	15,000	10,000
Earnings per share [EPS]	47	59.25

Financing Plan II [i.e. Raising debt of ₹ 20 lakh and issue of equity share capital of ₹ 30 lakh] is the option which maximises the earnings per share.

Working Notes:

1. Calculation of interest on Debt.

Plan I	[₹ 5,00,000 x 12%]		₹ 60,000
Plan II	[₹ 5,00,000 x 12%]	₹ 60,000	₹ 2,10,000
	[₹ 15,00,000 x 10%]	₹ 1,50,000	

2. Number of equity shares to be issued

Plan I: Rs. 45,00,000 / Rs. 300 [Market Price of share] = 15,000 shares

Plan II: Rs. 30,00,000 / Rs. 300 [Market Price of share] = 10,000 shares

[*Alternatively, interest on Debt for Plan II can be 20,00,000 X 10% i.e. ₹ 2,00,000. accordingly, the EPS for the Plan II will be ₹60]

9.

Ascertainment of probable price of shares of Prakash limited

	Plan-I	Plan-II
	If ₹ 5,00,000 is raised as debt [₹]	**If ₹ 5,00,000 is raised by issuing equity shares [₹]**
Earnings Before Interest and Tax [EBIT] {20% of new capital i.e., 20% of [₹15,00,000 + ₹ 5,00,000]} [Refer working note1]	4,00,000	4,00,000
Less: Interest on old debentures [10% of ₹5,00,000]	[50,000]	[50,000]

Less: Interest on new debt [12% of ₹5,00,000]	[60,000]	--
Earnings Before Tax [EBT]	2,90,000	3,50,000
Less: Tax @ 50%	[1,45,000]	[1,75,000]
Earnings for equity shareholders [EAT]	1,45,000	1,75,000

No. of Equity Shares [refer working note 2]	25,000	35,000
Earnings per Share [EPS]	₹ 5.80	₹ 5.00
Price/ Earnings [P/E] Ratio [refer working note 3]	8	10
Probable Price Per Share [PE Ratio × EPS]	₹ 46.40	₹ 50

Working Notes:

1. Calculation of existing Return of Capital Employed [ROCE]:

	[₹]
Equity Share capital [25,000 shares × ₹10]	2,50,000
10% Debentures [₹50,000 x 100 /10]	5,00,000
Reserves and Surplus	7,50,000
Total Capital Employed	15,00,000
Earnings before interest and tax [EBIT] [given]	3,00,000
ROCE = 3,00,000 100 15,00,000 ₹ ₹	20%

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

= 5,00,000 / 50 = ₹10,000 Shares

Thus, after the issue total number of shares = 25,000+ 10,000 = 35,000 shares

3. Debt/Equity Ratio if ₹ 5,00,000 is raised as debt:

= ₹10,00,000 / ₹20,00,000 x 100 = 50%

As the debt equity ratio is more than 40% the P/E ratio will be brought down to 8 in Plan-I

10.

Current Capital Structure		
Equity Share Capital	₹ 20 x 7 lakhs	₹ 1,40,00,000
Reserves		₹ 10,00,000
9% Bonds		₹ 3,00,00,000
11% Preference Share Capital	₹ 50 x 3 lakhs	₹ 1,50,00,000
Total Capital Employed		₹ 6,00,00,000

Proposed Capital Structure

Capital	Working	Proposal I	Proposal II
Capital to be raised		₹5,00,00,000	₹5,00,00,000
Equity	50000000 x 25%	₹ 1,25,00,000	-
	50000000 x 50%	-	₹ 2,50,00,000
Debt @ 10%	50000000 x 75%	₹ 3,75,00,000	-
Preference Shares @ 12%	50000000 x 50%	-	₹ 2,50,00,000
Combined Capital		**Amount [proposal 1]**	**Amount [proposal 2]**
Equity		₹ 2,65,00,000	₹ 3,90,00,000
Reserves		₹ 10,00,000	₹ 10,00,000
9% Bond		₹ 3,00,00,000	₹ 3,00,00,000
10% Debt		₹ 3,75,00,000	-
11% Preference Shares		₹ 1,50,00,000	₹ 1,50,00,000
12% Preference Shares		-	₹ 2,50,00,000
		₹ 11,00,00,000	₹ 11,00,00,000

Interest for Proposal I = ₹ 3,00,00,000 x 9% + ₹ 3,75,00,000 x 10%

= ₹ 27,00,000 + ₹ 37,50,000

= ₹ 64,50,000

Preference Dividend for Proposal I = ₹ 1,50,00,000 x 11% = ₹ 16,50,000

Interest for Proposal II = ₹ 3,00,00,000 x 9% = ₹ 27,00,000

Preference Dividend for Proposal II = ₹ 1,50,00,000 x 11% + ₹ 2,50,00,000 x 12%

= ₹ 16,50,000 + ₹ 30,00,000 = ₹ 46,50,000

Let the indifference point be ₹ X

For Proposal I,

EPS = [1] [] X - ₹64,50,000 x 0.66 - ₹16,50,000 / ₹13,25,000

For Proposal II,

EPS = [2] [] X - ₹27,00,000 x 0.66 - ₹46,50,000 / ₹13,25,000

Equating [1] and [2],

EPS = [X - ₹64,50,000] x 0.66 - ₹16,50,000 / ₹13,25,000

= [X - 27,00,000] x 0.66 - ₹46,50,000 / 19,50,000 ₹

0.66 X ₹42,57,000 - ₹16,50,000 / ₹1325 = 0.66X - ₹17,82,000 - ₹46,50,000 / 1,950

= 0.66X - 59,07,000 / ₹53 …… = 0.66X - ₹64,32,000 / ₹78

₹ 51.48X – ₹ 46,07,46,000 = ₹ 37.98X - ₹34,08,96,000

₹ 16.5X = ₹ 11,98,50,000

Indifference Point = X = ₹ 72,63,636.36

11.

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 [EAIT]	1,36,000	1,60,000
Number of Equity Shares [in numbers]	30,000	40,000
Earnings per Share [EPS]	4.53	4.00
Price/ Earnings Ratio	8	10
Probable Price Per Share	36.24 [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 $\left(40{,}000 \times \frac{100}{10}\right)$	4,00,000
Reserves [given]	7,00,000
14,00,000	
Earnings before interest and tax [EBIT] given	2,80,000
Rate of Present Earnings = $\left(\frac{2{,}80{,}000}{14{,}00{,}000} \times 100\right)$	20%
2. Number of Equity Shares to be issued in $\left(\frac{4{,}00{,}000}{40}\right)$	10,000
Thus, after the issue total number of shares	30,000 + 10,000 = 40,000

3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:	$\left(\frac{8,00,000}{18,00,000}\times 100\right)$ = 44.44%

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

12.

[a] Assuming no tax as per MM Approach.

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered[u]]

Total Value of Unlevered Firm [Vu] = [NOI/k_e] = 9,00,000/0.18 = ₹ 50,00,000

Ke of Unlevered Firm [given] = 0.18

Ko of Unlevered Firm [Same as above = k_e as there is no debt] = 0.18

Market Value of 'Bee Ltd' [Levered Firm [I]]

Total Value of Levered Firm [VL] = Vu + [Debt× Nil]

= ₹ 50,00,000 + [27,00,000 × nil]

= ₹ 50,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital [WACC]

Particulars	Bee Ltd.
Net Operating Income [NOI]	9,00,000
Less: Interest on Debt [I]	3,24,000
Earnings of Equity Shareholders [NI]	5,76,000
Overall Capitalization Rate [ko]	0.18
Total Value of Firm [V = NOI/ko]	50,00,000
Less: Market Value of Debt	27,00,000
Market Value of Equity [S]	23,00,000
Equity Capitalization Rate [ke = NI /S]	0.2504
Weighted Average Cost of Capital [ko]* $k_o = [k_e \times S/V] + [k_d \times D/V]$	0.18

*Computation of WACC Bee Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	23,00,000	0.46	0.2504	0.1152
Debt	27,00,000	0.54	0.12*	0.0648
Total	50,00,000			0.18

*K_d = 12% [since there is no tax]

WACC = 18%

[b] Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'Bee Ltd.' and 'Cee Ltd' according to MM Hypothesis

Market Value of 'Cee Ltd' [Unlevered[u]]

Total Value of unlevered Firm [V_u] = [NOI [1 - t]/k_e] = 9,00,000 [1 – 0.40]] / 0.18

= ₹ 30,00,000

K_e of unlevered Firm [given] = 0.18

K_o of unlevered Firm [Same as above = ke as there is no debt] = 0.18

Market Value of 'Bee Ltd' [Levered Firm [I]]

Total Value of Levered Firm [V_L] = V_u + [Debt× Tax]

= ₹ 30,00,000 + [27,00,000 × 0.4]

= ₹ 40,80,000

Computation of Weighted Average Cost of Capital [WACC] of 'Cee Ltd.'

= 18% [i.e. Ke = Ko]

Computation of Equity Capitalization Rate and

Weighted Average Cost of Capital [WACC] of Bee Ltd

Particulars	Bee Ltd. [₹]
Net Operating Income [NOI]	9,00,000
Less: Interest on Debt [I]	3,24,000
Earnings Before Tax [EBT]	5,76,000
Less: Tax @ 40%	2,30,400
Earnings for equity shareholders [NI]	3,45,600
Total Value of Firm [V] as calculated above	40,80,000
Less: Market Value of Debt	27,00,000
Market Value of Equity [S]	13,80,000
Equity Capitalization Rate [ke = NI/S]	0.2504
Weighted Average Cost of Capital [ko]* $k_o = [k_e \times S/V] + [k_d \times D/V]$	13.23

*Computation of WACC Bee Ltd.

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	13,80,000	0.338	0.2504	0.0846
Debt	27,00,000	0.662	0.072*	0.0477
Total	40,80,000			0.1323

*Kd= 12% [1- 0.4] = 12% × 0.6 = 7.2%

WACC = 13.23%

13.

Workings:

Market Value of Equity = Net income [NI] for equity holders / K_e

₹ 1,750 lakhs = Net income [NI] for equity holders / 0.20

Net Income to equity holders/EAT = ₹ 350 lakhs

Therefore, EBIT = EAT / [1-t] = 350 lakhs / [1 - 0.3] = ₹ 500 lakhs

Income Statement

	All Equity [₹ In lakhs]	**Equity & Debt [₹ In lakhs]**
EBIT [as calculated above]	500	500
Interest on ₹ 275 lakhs @ 15%	--	41.25
EBT	500	458.75
Tax @ 30%	150	137.63
Income available to equity holders	350	321.12

[i] Market value of the company

Market value of levered firm = Value of unlevered firm + Tax Advantage
= ₹ 1,750 lakhs + [₹ 275 lakhs x 0.3]
= ₹ 1,832.5 lakhs

Change in market value of the company = ₹ 1,832.5 lakhs – ₹ 1,750 lakhs
= ₹ 82.50 lakhs

The impact is that the market value of the company has increased by ₹ 82.50 lakhs due to replacement of equity with debt.

[ii] Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased
= ₹ 1,832.50 lakhs – ₹ 275 lakhs = ₹ 1,557.50 lakhs

Cost of Equity [K_e] = [Net Income to equity holders / Market value of equity] x 100
= [₹ 321.12 lakhs / ₹ 1,557.50 lakhs] x 100 = 20.62%

Cost of debt [K_d] = I [1 - t] = 15 [1 - 0.3] = 10.50%

Components	**Amount [₹ In lakhs]**	**Cost of Capital %**	**Weight**	**WACC [Ko] %**
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or Ko has fallen by 0.89% [20% - 19.11%] due to the benefit of tax relief on debt interest payment.

[iii] Cost of Equity

The impact is that cost of equity has risen by 0.62% [20.62% - 20%] due to the presence of financial risk i.e. introduction of debt in capital structure.

Note: Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

Cost of Capital $[K_o] = K_{eu} [1 – [t \times L]]$

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

L = Debt / Debt + Equity

So, $K_o = 0.20 \left[1 - \left(0.3 \times \frac{Rs.275lakhs}{Rs.1,832.5lakhs}\right)\right] = 0.191$ or 19.10% [approx.]

Cost of Equity $[K_e] = K_{eu} + [K_{eu} – K_d]$ Debt [1- t] / Equity

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

So, $Ke = 0.20 + \left[(0.20 - 0.15) \times \frac{Rs.275lakhs(1 - 0.3)}{Rs.1557.5lakhs}\right] = 0.2062$ or 20.62%

14.

[a] Amount of debt to be employed by firm as per traditional approach

Calculation of Equity, Wd and We

Total Capital [₹]	Debt [₹]	Wd	Equity value [₹]	We
[a]	[b]	[b]/[a]	[c] = [a] - [b]	[c]/[a]
50,00,000	0	-	50,00,000	1.0
50,00,000	5,00,000	0.1	45,00,000	0.9
50,00,000	10,00,000	0.2	40,00,000	0.8
50,00,000	15,00,000	0.3	35,00,000	0.7
50,00,000	20,00,000	0.4	30,00,000	0.6
50,00,000	25,00,000	0.5	25,00,000	0.5
50,00,000	30,00,000	0.6	20,00,000	0.4

Statement of Weighted Average Cost of Capital [WACC]

Ke	We	Kd	Wd	Ke We	KdWd	Ko
[1]	[2]	[3]	[4]	[5] = [1] x [2]	[6] = [3] x [4]	[7] = [5] + [6]
0.100	1.0	-	-	0.100	-	0.100
0.105	0.9	0.060	0.1	0.095	0.006	0.101
0.110	0.8	0.060	0.2	0.088	0.012	0.100
0.113	0.7	0.062	0.3	0.079	0.019	0.098
0.124	0.6	0.070	0.4	0.074	0.028	0.102
0.135	0.5	0.075	0.5	0.068	0.038	0.106
0.160	0.4	0.080	0.6	0.064	0.048	0.112

So, amount of Debt to be employed = ₹ 15,00,000 as WACC is minimum at this level of debt i.e. 9.8%.

[b] As per MM approach, cost of the capital [Ko] remains constant and cost of equity increases linearly with debt.

Value of a firm = Net Operating Income[NOI] / K_o

₹ 50,00,000 = 5,00,000 / K_o

Ko = ₹5,00,000 / ₹50,00,000 = 10%

Statement of Equity Capitalization rate [ke] under MM approach

Debt [₹]	Equity [₹]	Debt/Equity	Ko	Kd	Ko - Kd	Ke = K_o + [K_o - K_d] Debt / Equity
[1]	[2]	[3] = [1]/[2]	[4]	[5]	[6] = [4] -[5]	[7] = [4] + [6] x [3]
0	50,00,000	0	0.10	-	0.100	0.100
5,00,000	45,00,000	0.11	0.10	0.060	0.040	0.104
10,00,000	40,00,000	0.25	0.10	0.060	0.040	0.110
15,00,000	35,00,000	0.43	0.10	0.062	0.038	0.116
20,00,000	30,00,000	0.67	0.10	0.070	0.030	0.120
25,00,000	25,00,000	1.00	0.10	0.075	0.025	0.125
30,00,000	20,00,000	1.50	0.10	0.080	0.020	0.130

15.

Computation of Rate of Preference Dividend

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

$$\frac{(Rs.4,80,000 - Rs.48,000)\times(1-0.30)}{80,00,000\,shares} = \frac{Rs.4,80,000(1-0.30) - Preference\,Dividend}{80,00,000\,shares}$$

$$\frac{Rs.2,02,400}{80,00,000 shares} = \frac{Rs.3,36,000 - Preference Dividend}{80,00,000 shares}$$

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

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

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

$$= \frac{Rs.33,600}{4,00,000} \times 100 = 8.4\%$$

16.

Computation of level of earnings before interest and tax [EBIT]

In case, alternative [i] is accepted, then the EPS of the firm would be:

$$EPS_{\text{Alternative [i]}} = \frac{(EBIT - interest)(1 - tax rate)}{No. of equity shares}$$

$$= \frac{(EBIT - interest \times Rs.40,00,000)(1 - 0.35)}{60,000 shares}$$

In case, alternative [ii] is accepted, then the EPS of the firm would be:

$$EPS_{\text{Alternative [ii]}} = \frac{(EBIT - 0.12 \times Rs.40,00,000)(1 - 0.35) - (0.14 \times Rs.20,00,000)}{40,000 shares}$$

In order to determine the indifference level of EBIT, the EPS under the two alternative plans should be equated as follows:

$$= \frac{(EBIT - 0.12 \times Rs.40,00,000)(1 - 0.35)}{60,000 shares} = \frac{(EBIT - 0.12 \times Rs.40,00,000)(1 - 0.35) - (0.14 \times Rs.20,00,000)}{40,000 shares}$$

$$\text{Or } \frac{0.65EBIT - Rs.3,12,000}{3} = \frac{0.65EBIT - Rs.5,92,000}{2}$$

Or 1.30 EBIT – ₹6,24,000 = 1.95 EBIT – ₹17,76,000

Or [1.95 – 1.30] EBIT = ₹17,76,000 – ₹6,24,000 = ₹11,52,000

Or EBIT = ₹11,52,000 / 0.65

Or EBIT = ₹17,72,308

17.

[i] Computation of Earnings per Share [EPS]

Plans	P [₹]	Q [₹]	R [₹]
Earnings before interest & tax [EBIT]	3,60,00,000	3,60,00,000	3,60,00,000
Less: Interest charges	--	[48,00,000]	--
Earnings before tax [EBT]	3,60,00,000	3,12,00,000	3,60,00,000
Less : Tax @ 40%	[1,44,00,000]	[1,24,80,000]	[1,44,00,000]

Earnings after tax [EAT]	2,16,00,000	1,87,20,000	2,16,00,000
Less : Preference share dividend	-- -	-	[48,00,000]
Earnings available for equity shareholders	2,16,00,000	1,87,20,000	1,68,00,000
No. of equity shares	40,00,000	20,00,000	20,00,000
E.P.S	5.40	9.36	8.40

[ii] Computation of Financial Break-even Points

Proposal 'P' = 0

Proposal 'Q' = ₹48,00,000 [Interest charges]

Proposal 'R' = Earnings required for payment of preference share dividend

i.e. ₹48,00,000 ⍰ 0.6 = ₹80,00,000

[iii] Computation of Indifference Point between the Proposals

Combination of Proposals

[a] Indifference point where EBIT of proposal "P" and proposal 'Q' is equal

EBIT[1-0.4] / 40,00,000shares = [EBIT-₹48,00,000][1-0.4] / 20,00,000shares

0.6 EBIT = 1.2 EBIT – ₹57,60,000

EBIT = ₹96,00,000

[b] Indifference point where EBIT of proposal 'P' and proposal 'R' is equal:

EBIT[1-0.40] /40,00,000shares = EBIT[1-0.40] - ₹48,00,000 / 20,00,000shares

0.6EBIT / ₹40,00,000shares = 0.6EBIT - ₹48,00,000 / 20,00,000shares

0.30 EBIT = 0.6 EBIT – ₹48,00,000

EBIT = ₹48,00,000 / 0.30 =₹1,60,00,000

[c] Indifference point where EBIT of proposal 'Q' and proposal 'R' are equal

[EBIT - ₹48,00,000][1-0.4] / 20,00,000 shares ₹ = EBIT[1-0.4] -₹48,00,000 / 20,00,000 shares

18.

Ascertainment of probable price of shares of Akash limited

	Plan-I	**Plan-I I**
	If ₹ 4,00,000 is raised as debt [₹]	**If ₹ 4,00,000 is raised by issuing equity shares [₹]**
Earnings Before Interest and Tax [EBIT] {20% of new capital i.e. 20% of [₹14,00,000 + ₹4,00,000]} [Refer working note1]	3,60,000	3,60,000
Less: Interest on old debentures [10% of ₹4,00,000]	[40,000]	[40,000]

Less: Interest on new debt [12% of ₹4,00,000]	[48,000]	--
Earnings Before Tax [EBT]	2,72,000	3,20,000
Less: Tax @ 50%	[1,36,000]	[1,60,000]
Earnings for equity shareholders [EAT]	1,36,000	1,60,000
No. of Equity Shares [refer working note 2]	30,000	40,000
Earnings per Share [EPS]	₹ 4.53	₹ 4.00
Price/ Earnings [P/E] Ratio [refer working note 3]	8	10
Probable Price Per Share [PE Ratio × EPS]	₹ 36.24	₹ 40

Working Notes:

1. Calculation of existing Return of Capital Employed [ROCE]:

	[₹]
Equity Share capital [30,000 shares × ₹10]	3,00,000
10% Debentures $\left(Rs.40,000 \times \frac{100}{10}\right)$	₹ 4,00,000
Reserves and Surplus	7,00,000
Total Capital Employed	14,00,000
Earnings before interest and tax [EBIT] [given]	2,80,000
ROCE = $\frac{Rs.2,80,000}{Rs.14,00,000} \times 100$	20%

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

= ₹4,00,000 / ₹40 = 10,000shares

Thus, after the issue total number of shares = 30,000+ 10,000 = 40,000 shares

3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:

= 8,00,000 / 18,00,000 x 100 = 44.44%

As the debt equity ratio is more than 40% the P/E ratio will be brought down to 8 in Plan-I

CHAPTER 4: INVESTMENT DECISIONS

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

A company wants to invest in a project. This requires an initial investment of ₹ 4,50,000. Salvage value after estimated useful life of 5 years is ₹ 50,000. Other details of project are as follows:

	Worst case	Most likely	Best case
Contribution [₹]	3,30,000	5,40,000	6,31,250
Fixed cost [excluding depreciation] [₹]	75,000	1,50,000	2,00,000

Tax rate is 40%. Expected cost of capital of project is 12%. Ignore tax on capital gain.

(i) Calculate NPV in each scenario.

(ii) The company is certain about most likely result in first two years, but uncertain about remaining period. In such a situation, calculate NPV expecting worst case scenario during next two years and best case scenario in the remaining period.

Years	1	2	3	4	5
PVIF0.12,t	0.893	0.797	0.712	0.636	0.567
PVIFA0.12,t	0.893	1.690	2.402	3.038	3.605

PROBLEM – 2 [NOV 22]

A firm is in need of a small vehicle to make deliveries. It is in tending 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%.

You are 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

PROBLEM – 3 [MAY 22]

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

- reduction of five employees with annual salaries of ₹ 3,00,000 each
- reduction of ₹ 3,00,000 in production delays caused by inventory problem
- reduction in lost sales ₹ 2,50,000 and

- Gain due to timely billing ₹ 2,00,000

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

The estimated life of the system is 5 years and it will be depreciated on a straight -line basis.

However, the operation of the new system requires two computer specialists with annual salaries of ₹ 5,00,000 per person. In addition to above, annual maintenance and operating cost for five years are as below: **[Amount in ₹]**

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

Maintenance and operating cost are payable in advance.

The company's tax rate is 30% and its required rate of return is 15%.

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

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

PROBLEM – 4 [NOV 21]

Stand Ltd. is contemplating replacement of one of its machines which has become outdated and inefficient. Its financial manager has prepared a report outlining two possible replacement machines. The details of each machine are as follows:

	Machine 1	Machine 2
Initial investment	₹ 12,00,000	₹ 16,00,000
Estimated useful life	3 years	5 years
Residual value	₹ 1,20,000	₹ 1,00,000
Contribution per annum	₹ 11,60,000	₹ 12,00,000
Fixed maintenance costs per annum	₹ 40,000	₹ 80,000
Other fixed operating costs per annum	₹ 7,20,000	₹ 6,10,000

The maintenance costs are payable annually in advance. All other cash flows apart from the initial investment assumed to occur at the end of each year. Depreciation has been calculated by straight line method and has been included in other fixed operating costs. The expected cost of capital for this project is assumed as 12% p.a.

Required:

(i) Which machine is more beneficial, using Annualized Equivalent Approach? Ignore tax.

(ii) Calculate the sensitivity of your recommendation in part [i] to changes in the contribution

generated by machine 1.

Year	1	2	3	4	5	6
PVIF0.12,t	0.893	0.797	0.712	0.636	0.567	0.507
PVIFA0.12,t	0.893	1.690	2.402	3.038	3.605	4.112

PROBLEM – 5 [JULY 21]

An existing company has a machine which has been in operation for two years, its estimated remaining useful life is 4 years with no residual value in the end. Its current market value is ₹ 3 lakhs. The management is considering a proposal to purchase an improved model of a machine gives increase output. The details are as under:

Particulars	Existing Machine	New Machine
Purchase Price	₹ 6,00,000	₹ 10,00,000
Estimated Life	6 years	4 years
Residual Value	0	0
Annual Operating days	300	300
Operating hours per day	6	6
Selling price per unit	₹ 10	₹ 10
Material cost per unit	₹ 2	₹ 2
Output per hour in units	20	40
Labour cost per hour	₹ 20	₹ 30
Fixed overhead per annum excluding depreciation	₹ 1,00,000	₹ 60,000
Working Capital	₹ 1,00,000	₹ 2,00,000
Income-tax rate	30%	30%

Assuming that - cost of capital is 10% and the company uses written down value of depreciation @ 20% and it has several machines in 20% block.

Advice the management on the Replacement of Machine as per the NPV method. The discounting factors table given below:

Discounting Factors	Year 1	Year 2	Year 3	Year 4
10%	0.909	0.826	0.751	0.683

PROBLEM – 6 [JAN 21]

A company wants to buy a machine, and two different models namely A and B are available.

Following further particulars are available:

Particulars	Machine-A	Machine-B
Original Cost [₹]	8,00,000	6,00,000
Estimated Life in years	4	4

Salvage Value [₹]	0	0

The company provides depreciation under Straight Line Method. Income tax rate applicable is 30%. The present value of ₹ 1 at 12% discounting factor and net profit before depreciation and tax are as under:

Year	Net Profit Before Depreciation and tax		PV Factor
	Machine-A ₹	Machine-B ₹	
1.	2,30,000	1,75,000	0.893
2.	2,40,000	2,60,000	0.797
3.	2,20,000	3,20,000	0.712
4.	5,60,000	1,50,000	0.636

Calculate:

1. NPV [Net Present Value]

2. Discounted pay-back period

3. PI [Profitability Index]

Suggest: Purchase of which machine is more beneficial under Discounted pay-back period method, NPV method and PI method.

PROBLEM – 7 [NOV 20]

CK Ltd. is planning to buy a new machine. Details of which are as follows:

Cost of the Machine at the commencement	₹ 2,50,000
Economic Life of the Machine	8 year
Residual Value	Nil
Annual Production Capacity of the Machine	1,00,000 units
Estimated Selling Price per unit	₹ 6
Estimated Variable Cost per unit	₹ 3
Estimated Annual Fixed Cost	₹ 1,00,000 [Excluding depreciation]
Advertisement Expenses in 1st year in addition of annual fixed cost	₹ 20,000
Maintenance Expenses in 5th year in addition of annual fixed cost	₹ 30,000
Cost of Capital	12%

Ignore Tax.

Analyse the above mentioned proposal using the Net Present Value Method and advice.

P.V. factor @ 12% are as under:

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

PROBLEM – 8 [NOV 19]

Door Ltd. is considering an investment of ₹ 4,00,000. This investment is expected to generate substantial cash inflows over the next five years. Unfortunately, the annual cash flows from this investment is uncertain, and the following profitability distribution has been established.

Annual Cash Flow [₹]	Probability
50,000	0.3
1,00,000	0.3
1,50,000	0.4

At the end of its 5 years life, the investment is expected to have a residual value of ₹ 40,000.

The cost of capital is 5%

Calculate NPV under the three different scenarios.

Calculate Expected Net Present Value.

Advise Door Ltd. on whether the investment is to be undertaken.

Year	1	2	3	4	5
DF @ 5%	0.952	0.907	0.864	0.823	0.784

PROBLEM – 9 [NOV 18]

PD Ltd. an existing company, is planning to introduce a new product with projected life of 8 years. Project cost will be ₹ 2,40,00,000. At the end of 8 years no residual value will be realized. Working capital of ₹ 30,00,000 will be needed. The 100% capacity of the project is 2,00,000 units p.a. but the Production and Sales Volume is expected are as under :

Year	Number of Units
1	60,000 units
2.	80,000 units
3-5	1,40,000 units
6-8	1,20,000 units

Other Information:

(i) Selling price per unit ₹ 200

(ii) Variable cost is 40 of sales.

(iii) Fixed cost p.a. ₹ 30,00,000.

(iv) In addition to these advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure [₹]	50,00,000	25,00,000	10,00,000	5,00,000

(v) Income Tax is 25%.

(vi) Straight line method of depreciation is permissible for tax purpose.

(vii) Cost of capital is 10%.

(viii) Assume that loss cannot be carried forward.

PART – B: [REVISION TEST PAPERS]

PROBLEM – 10 [RTP - NOV 23]

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

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

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

PROBLEM – 11 [RTP - MAY 23]

Dharma Ltd, an existing profit-making company, is planning to introduce a new product with a projected life of 8 years. Initial equipment cost will be ₹ 240 lakhs and additional equipment costing ₹ 26 lakhs will be needed at the beginning of third year. At the end of 8 years, the original equipment will have resale value equivalent to the cost of removal, but the additional equipment would be sold for ₹ 2 lakhs. Working Capital of ₹ 25 lakhs will be needed at the beginning of the operations. The 100% capacity of the plant is of 4,00,000 units per annum, but the production and sales volume expected are as under:

Year	Capacity [%]
1	20
2	30
3-5	75
6-8	50

A sale price of ₹ 100 per unit with a profit volume ratio [contribution/sales] of 60% is likely to be obtained. Fixed operating cash cost are likely to be ₹ 16 lakhs per annum. In addition to this the advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure [₹ Lakhs each year]	30	15	10	4

The company is subjected to 50% tax rate and consider 12% to be an appropriate cost of capital. Straight line method of depreciation is followed by the company. ADVISE the management on the desirability of the project.

PROBLEM – 12 [RTP - NOV 22]

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

PROBLEM – 13 [RTP - MAY 22]

ABC & Co. is considering whether to replace an existing machine or to spend money on revamping it. ABC & 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 ABC & 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

PROBLEM – 14 [RTP - NOV 21]

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 2021. 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 allowed taking 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

PROBLEM – 15 [RTP - MAY 21]

The General Manager of Merry Ltd. is considering the replacement of five-year-old equipment. The company has to incur excessive maintenance cost of the equipment. The equipment has zero written down value. It can be modernized at a cost of ₹ 1,40,000 enhancing its economic life to 5 years. The equipment could be sold for ₹ 30,000 after 5 years. The modernization would help in material handling and in reducing labour, maintenance & repairs costs.

The company has another alternative to buy a new machine at a cost of ₹ 3,50,000 with an economic life of 5 years and salvage value of ₹ 60,000. The new machine is expected to be more efficient in reducing costs of material handling, labour, maintenance & repairs, etc.

The annual cost are as follows:

	Existing Equipment [₹]	Modernization [₹]	New Machine [₹]
Wages & Salaries	45,000	35,500	15,000
Supervision	20,000	10,000	7,000
Maintenance	25,000	5,000	2,500
Power	30,000	20,000	15,000
	1,20,000	70,500	39,500

Assuming tax rate of 50% and required rate of return of 10%, should the company modernize the equipment or buy a new machine?

PV factor at 10% are as follows:

7B Year	1	2	3	4	5
PV factor	0.909	0.826	0.751	0.683	0.621

PROBLEM – 16 [RTP - NOV 20]

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 financed by a loan

repayable in 4 equal instalments 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 of materials will utilise 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 include 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.

PROBLEM – 17 [RTP - MAY 20]

A company is considering the proposal of taking up a new project which requires an investment of ₹800 lakhs on machinery and other assets. The project is expected to yield the following earnings [before depreciation and taxes] over the next five years:

Year	Earnings [₹ in lakhs]
1	320
2	320
3	360
4	360

5	300

The cost of raising the additional capital is 12% and assets have to be depreciated at 20% on written down value basis. The scrap value at the end of the five year period may be taken as zero. Income-tax applicable to the company is 40%.

PROBLEM – 18 [RTP - NOV 19]

MTR Limited is considering buying a new machine which would have a useful economic life of five years, at a cost of ₹25,00,000 and a scrap value of ₹3,00,000, with 80 per cent of the cost being payable at the start of the project and 20 per cent at the end of the first year. The machine would produce 75,000 units per annum of a new product with an estimated sellingpriceof ₹300 per unit. Direct costs would be ₹285 per unit and annual fixed costs, including depreciation calculated on a straight- line basis, would be ₹8,40,000 per annum.

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to ₹1,00,000 and ₹1,50,000 respectively.

EVALUATE the project using the NPV method of investment appraisal, assuming the company's cost of capital to be 15 percent.

PROBLEM – 19 [RTP - MAY 19]

BT Pathology Lab Ltd. is using an X-ray machines which reached at the end of their useful lives. Following new X-ray machines are of two different brands with same features are available for the purchase.

Brand	Cost of Machine	Life of Machine	Maintenance Cost			Rate of Depreciation
			Year 1-5	Year 6-10	Year 11-15	
XYZ	₹6,00,000	15 years	₹ 20,000	₹ 28,000	₹ 39,000	4%
ABC	₹4,50,000	10 years	₹ 31,000	₹ 53,000	--	6%

Residual Value of both of above machines shall be dropped by 1/3 of Purchase price in the first year and thereafter shall be depreciated at the rate mentioned above.

Alternatively, the machine of Brand ABC can also be taken on rent to be returned back to the owner after use on the following terms and conditions:

- Annual Rent shall be paid in the beginning of each year and for first year it shall be ₹ 1,02,000.
- Annual Rent for the subsequent 4 years shall be ₹ 1,02,500.
- Annual Rent for the final 5 years shall be ₹ 1,09,950.
- The Rent Agreement can be terminated by BT Labs by making a payment of ₹ 1,00,000 as penalty. This penalty would be reduced by ₹ 10,000 each year of the period of rental agreement.

You are required to:

(a) ADVISE which brand of X-ray machine should be acquired assuming that the use of machine shall be continued for a period of 20 years.

(b) STATE which of the option is most economical if machine is likely to be used for a period of 5 years?

The cost of capital of BT Labs is 12%.

ANSWERS

1.

[a] Determination of the amount of equity and debt for raising additional finance:

Pattern of raising additional finance

Equity 3/4 of ₹ 5 Crore = ₹ 3.75 Crore

Debt 1/4 of ₹ 5 Crore = ₹ 1.25 Crore

The capital structure after raising additional finance:

Particulars	[₹ In crore]
Shareholders' Funds	
Equity Capital [3.75 – 1.00]	2.75
Retained earnings	1.00
Debt [Interest at 10% p.a.]	0.75
[Interest at 12% p.a.] [1.25-0.75]	0.50
Total Funds	5.00

[b] Determination of post-tax average cost of additional debt

$K_d = I [1 – t]$

Where,

I = Interest Rate

t = Corporate tax-rate

On ₹ 75,00,000 = 10% [1 – 0.25] = 7.5% or 0.075

On ₹ 50,00,000 = 12% [1 – 0.25] = 9% or 0.09

Average Cost of Debt

= [₹75,00,0000.x 075] + [₹50,00,0000.09] / 1,25,00,000 x 100

= 5,62,500 + 4,50,000 / 1,25,00,000 x 100 = 8.10%

[c] Determination of cost of retained earnings and cost of equity [Applying Dividend growth model]:

$K_e = K_e = \frac{D_1}{P} + g$

Where,

K_e = Cost of equity

D_1 = DO [1+ g]

D_0 = Dividend paid [i.e = ₹ 2]

g = Growth rate

P_0 = Current market price per share

Then, K_e = Rs. 2 [1.05] / Rs.25 + 0.05 = Rs. 2.1 / Rs.25 + 0.05 = 0.084 + 0.05 = 0.134

= 13.4% Cost of retained earnings equals to cost of Equity i.e. 13.4%

[d] Computation of overall weighted average after tax cost of additional finance

Particular	[₹]	Weights	Cost of funds	Weighted Cost [%]
Equity [including retained earnings]	3,75,00,000	3/4	13.4%	10.05
Debt	1,25,00,000	1/4 8.	1%	2.025
WACC	5,00,00,000		12.075	

2.

Selection of Investment Decision

Tax shield on Purchase of New vehicle			
Year	WDV	Dep. @ 25%	Tax shield @ 30%
1	1,50,000	37,500	11,250
2	1,12,500	28,125	8,437
3	84,375	21,094	6,328
4	63,281	15,820	4,746
5	47,461	11,865	3,560
6	35,596	8,899	2,670
7	26,697	6,674	2,002
8	20,023	5,006	1,502
9	15,017	3,754	1,126
10	11,263	2,816	845
11	8,447		Scrap value

Tax shield on Purchase of Second hand vehicles

Year	WDV	Dep. @ 25%	Tax shield @ 30%	
1	80,000	20,000	6,000	
2	60,000	15,000	4,500	
3	45,000	11,250	3,375	
4	33,750	8,437	2,531	
5	25,313	6,328	1,898	Scrap value = ₹ 18,985
6	60,000	15,000	4,500	
7	45,000	11,250	3,375	
8	33,750	8,437	2,531	
9	25,313	6,328	1,898	
10	18,985	4,746	1,424	Scrap value = ₹ 14,239

Calculation of PV of Net outflow of New Vehicle

Year	Cash OF/IF	PV Factor	PV of OF/IF
0	1,50,000	1	1,50,000

1	[11,250]	0.892	[10,035]
2	[8,437]	0.797	[6,724]
3	[6,328]	0.711	[4,499]
4	[4,746]	0.635	[3,014]
5	[3,560]	0.567	[2,018]
6	[2,670]	0.506	[1,351]
7	[2,002]	0.452	[905]
8	[1,502]	0.403	[605]
9	[1,126]	0.360	[405]
10	[845 + 8447]	0.322	[2,992]
		PVNOF	**1,17,452**

Calculation of PV of Net outflow of Second hand Vehicles

Year	Cash OF/IF	PV Factor	PV of OF/IF
0	80,000	1	80,000
1	[6,000]	0.892	[5,352]
2	[4,500]	0.797	[3,587]
3	[3,375]	0.711	[2,400]
4	[2,531]	0.635	[1,607]
5	[60000 – 18985 – 1898] = 39,117	0.567	22,179
6	[4,500]	0.506	[2,277]
7	[3,375]	0.452	[1,525]
8	[2,531]	0.403	[1,020]
9	[1,898]	0.360	[683]
10	[1424 + 14239] = [15,663]	0.322	[5,043]
		PVNOF	**78,686**

Advise: The PV of net outflow is low in case of buying the second hand vehicles. Therefore, it is advisable to buy second hand vehicles

3.

Computation of Annual Cash Flow after Tax						
Particulars	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Savings in Salaries		15,00,000	15,00,000	15,00,000	15,00,000	15,00,000
Reduction in Production Delays		3,00,000	3,00,000	3,00,000	3,00,000	3,00,000
Reduction in Lost Sales		2,50,000	2,50,000	2,50,000	2,50,000	2,50,000
Gain due to Timely Billing		2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
Salary to Computer Specialist		[10,00,000]	[10,00,000]	[10,00,000]	[10,00,000]	[10,00,000]

Maintenance and Operating Cost [payable in advance]		[2,00,000]	[1,80,000]	[1,60,000]	[1,40,000]	[1,20,000]
Depreciation [21 lakhs/5]		[4,20,000]	[4,20,000]	[4,20,000]	[4,20,000]	[4,20,000]
Gain Before Tax		6,30,000	6,50,000	6,70,000	6,90,000	7,10,000
Less: Tax [30%]		1,89,000	1,95,000	2,01,000	2,07,000	2,13,000
Gain After Tax		4,41,000	4,55,000	4,69,000	4,83,000	4,97,000
Add: Depreciation		4,20,000	4,20,000	4,20,000	4,20,000	4,20,000
Add: Maintenance and Operating Cost [payable in advance]		2,00,000	1,80,000	1,60,000	1,40,000	1,20,000
Less: Maintenance and Operating Cost [payable in advance]	[2,00,000]	[1,80,000]	[1,60,000]	[1,40,000]	[1,20,000]	-
Net CFAT	[2,00,000]	8,81,000	8,95,000	9,09,000	9,23,000	10,37,000

Note: Annual cash flows can also be calculated Considering tax shield on depreciation & maintenance and operating cost. There will be no change in the final cash flows after tax.

Computation of NPV				
Particulars	**Year**	**Cash Flows [₹]**	**PVF**	**PV [₹]**
Initial Investment [80% of 20 Lacs]	0	16,00,000	1	16,00,000
Installation Expenses	0	1,00,000	1	1,00,000
Instalment of Purchase Price	1	4,00,000	0.870	3,48,000
PV of Outflows [A]				**20,48,000**
CFAT	0	[2,00,000]	1	[2,00,000]
CFAT	1	8,81,000	0.870	7,66,470
CFAT	2	8,95,000	0.756	6,76,620
CFAT	3	9,09,000	0.658	5,98,122
CFAT	4	9,23,000	0.572	5,27,956
CFAT	5	10,37,000	0.497	5,15,389
PV of Inflows [B]				28,84,557
NPV [B-A]				**8,36,557**
Profitability Index [B/A]				**1.408 or 1.41**

Evaluation: Since the NPV is positive [i.e. ₹ 8,36,557] and Profitability Index is also greater than 1 [i.e. 1.41], Alpha Ltd. may introduce artificial intelligence [AI] while making computers.

4.

[i] Calculation of Net Cash flows

Machine 1

Other fixed operating costs [excluding depreciation] = 7,20,000–[[12,00,000–1,20,000]/3] = ₹ 3,60,000

Year	Initial Investment [₹]	Contribution [₹]	Fixed maintenance costs [₹]	Other fixed operating costs [excluding depreciation] [₹]	Residual Value [₹]	Net cash flow [₹]
0	[12,00,000]		[40,000]			[12,40,000]
1		11,60,000	[40,000]	[3,60,000]		7,60,000
2		11,60,000	[40,000]	[3,60,000]		7,60,000
3		11,60,000		[3,60,000]	1,20,000	9,20,000

Machine 2

Other fixed operating costs [excluding depreciation] = 6,10,000–[[16,00,000–1,00,000]/5] = ₹ 3,10,000

Year	Initial Investment [₹]	Contribution [₹]	Fixed maintenance costs [₹]	Other fixed operating costs [excluding depreciation] [₹]	Residual Value [₹]	Net cash flow [₹]
0	[16,00,000]		[80,000]			[16,80,000]
1		12,00,000	[80,000]	[3,10,000]		8,10,000
2		12,00,000	[80,000]	[3,10,000]		8,10,000
3		12,00,000	[80,000]	[3,10,000]		8,10,000
4		12,00,000	[80,000]	[3,10,000]		8,10,000
5		12,00,000		[3,10,000]	1,00,000	9,90,000

Calculation of Net Present Value

Machine 1			**Machine 2**		
Year	**12% discount factor**	**Net cash flow [₹]**	**Present value [₹]**	**Net cash flow [₹]**	**Present value [₹]**
0	1.000	[12,40,000]	[12,40,000]	[16,80,000]	[16,80,000]
1	0.893	7,60,000	6,78,680	8,10,000	7,23,330
2	0.797	7,60,000	6,05,720	8,10,000	6,45,570
3	0.712	9,20,000	6,55,040	8,10,000	5,76,720
4	0.636			8,10,000	5,15,160
5	0.567			9,90,000	5,61,330
NPV @ 12%			**6,99,440**		**13,42,110**
PVAF @ 12%			2.402		3.605
Equivalent Annualized Criterion			**2,91,190.674**		**3,72,291.262**

Recommendation: Machine 2 is more beneficial using Equivalent Annualized Criterion.

[ii] Calculation of sensitivity of recommendation in part [i] to changes in the contribution generated by machine 1

Difference in Equivalent Annualized Criterion of Machines required for changing the recommendation in part [i] = 3,72,291.262- 2,91,190.674 = ₹ **81,100.588**

 Sensitivity relating to contribution = ₹ 81,100.588 / ₹ 11,60,000.00×100 = 6.991 or **7% yearly**

Alternatively,

The annualized equivalent cash flow for machine 1 is lower by ₹ [3,72,291.262– 2,91,190.674] = ₹**81,100.588** than for machine 2. Therefore, it would need to increase contribution for **complete 3 years** before the decision would be to invest in this machine.

Sensitivity w.r.t contribution = 81,100.588 / [11,60,000 × 2.402] x100 = **2.911%**

5.

[i] Calculation of Net Initial Cash Outflows:

Particulars	₹
Purchase Price of new machine	10,00,000
Add: Net Working Capital	1,00,000
Less: Sale proceeds of existing machine	3,00,000
Net initial cash outflows	8,00,000

[ii] Calculation of annual Profit Before Tax and depreciation

Particulars	Existing machine	New Machine	Differential
[1]	**[2]**	**[3]**	**[4] = [3] – [2]**
Annual output	36,000 units	72,000 units	36,000 units
	₹	₹	₹
[A] Sales revenue @ ₹ 10 per unit	3,60,000	7,20,000	3,60,000
[B] Cost of Operation			
Material @ ₹ 2 per unit	72,000	1,44,000	72,000
Labour			
Old = 1,800 x ₹ 20	36,000		
New = 1,800 x ₹ 30		54,000	18,000
Fixed overhead excluding depreciation	1,00,000	60,000	[40,000]
Total Cost [B]	2,08,000	2,58,000	50,000
Profit Before Tax and depreciation [PBTD] [A – B]	**1,52,000**	**4,62,000**	**3,10,000**

[iii] Calculation of Net Present value on replacement of machine

Year	PBTD	Depreciation @ 20% WDV	PBT	Tax @ 30%	PAT	Net cash flow	PVF @ 10%	PV
[1]	[2]	[3]	[4 = 2-3]	[5]	[6 = 4-5]	[7 = 6 + 3]	[8]	[9 = 7 x 8]
1	3,10,000	1,40,000	1,70,000	51,000	1,19,000	2,59,000	0.909	2,35,431.000
2	3,10,000	1,12,000	1,98,000	59,400	1,38,600	2,50,600	0.826	2,06,995.600
3	3,10,000	89,600	2,20,400	66,120	1,54,280	2,43,880	0.751	1,83,153.880
4	3,10,000	71,680	2,38,320	71,496	1,66,824	2,38,504	0.683	1,62,898.232
								7,88,478.712
Add: Release of net working capital at year end 4 [1,00,000 x 0.683]								68,300.000
Less: Initial Cash Outflow								8,00,000.000
NPV								**56,778.712**

Advice: Since the incremental NPV is positive, existing machine should be replaced.

Working Notes:

1. Calculation of Annual Output

Annual output = [Annual operating days x Operating hours per day] x output per hour

Existing machine = [300 x 6] x 20 = 1,800 x 20 = 36,000 units

New machine = [300 x 6] x 40 = 1,800 x 40 = 72,000 units

2. Base for incremental depreciation

Particulars	₹
WDV of Existing Machine	
Purchase price of existing machine	6,00,000
Less: Depreciation for year 1 1,20,000	
Depreciation for Year 2 96,000	2,16,000
WDV of Existing Machine [i]	**3,84,000**
Depreciation base of New Machine	
Purchase price of new machine	10,00,000
Add: WDV of existing machine	3,84,000
Less: Sales value of existing machine	3,00,000
Depreciation base of New Machine [ii]	**10,84,000**
Base for incremental depreciation [[ii] – [i]]	**7,00,000**

[Note: The above solution have been done based on incremental approach]

Alternatively, solution can be done based on Total Approach as below:

[i] Calculation of depreciation:

Existing Machine						
Year 1	**Year 2**	**Year 3**		**Year 4**	**Year 5**	**Year 6**
Opening balance	6,00,000	4,80,000	3,84,000	3,07,200	2,45,760	1,96,608.00
Less: Depreciation @ 20%	1,20,000	96,000	76,800	61,440	49,152	39,321.60
WDV	4,80,000	3,84,000	3,07,200	2,45,760	1,96,608	1,57,286.40

New Machine				
	Year 1	**Year 2**	**Year 3**	**Year 4**
Opening balance	**10,84,000 ***	8,67,200	6,93,760	5,55,008.00
Less: Depreciation @ 20%	**2,16,800**	**1,73,440**	1,38,752	**1,11,001.60**
WDV	8,67,200	6,93,760	5,55,008	4,44,006.40

***** As the company has several machines in 20% block, the value of Existing Machine from the block calculated as below shall be added to the new machine of ₹ 10,00,000:

WDV of existing machine at the beginning of the year	₹ 3,84,000
Less: Sale Value of Machine	₹ 3,00,000
WDV of existing machine in the block	₹ 84,000

Therefore, opening balance for depreciation of block = ₹ 10,00,000 + ₹ 84,000 = ₹ 10,84,000

[ii] Calculation of annual cash inflows from operation:

Particulars	**EXISTING MACHINE**			
	Year 3	**Year 4**	**Year 5**	**Year 6**
Annual output [300 operating days x 6 operating hours x 20 output per hour]	**36,000 units**	**36,000 units**	**36,000 units**	**36,000 units**
	₹	₹	₹	₹
[A] **Sales revenue @ ₹ 10 per unit**	**3,60,000.00**	**3,60,000.00**	**3,60,000.00**	**3,60,000.00**
[B] Less: Cost of Operation				
Material @ ₹ 2 per unit	72,000.00	72,000.00	72,000.00	72,000.00
Labour @ ₹ 20 per hour for [300 x 6] hours	36,000.00	36,000.00	36,000.00	36,000.00
Fixed overhead	1,00,000.00	1,00,000.00	1,00,000.00	1,00,000.00
Depreciation	76,800.00	61,440.00	49,152.00	39,321.60
Total Cost [B]	**2,84,800.00**	**2,69,440.00**	**2,57,152.00**	**2,47,321.60**

Profit Before Tax [A – B]	75,200.00	90,560.00	1,02,848.00	1,12,678.40
Less: Tax @ 30%	22,560.00	27,168.00	30,854.40	33,803.52
Profit After Tax	52,640.00	63,392.00	71,993.60	**78,874.88**
Add: Depreciation	76,800.00	61,440.00	49,152.00	39,321.60
Add: Release of Working Capital				1,00,000.00
Annual Cash Inflows	**1,29,440.00**	**1,24,832.00**	**1,21,145.60**	**2,18,196.48**

Particulars	**NEW MACHINE**			
	Year 1	**Year 2**	**Year 3**	**Year 4**
Annual output [300 operating days x 6 operating hours x 40 output per hour]	**72,000 units**	**72,000 units**	**72,000 units**	**72,000 units**
₹	₹		₹	₹
[A] **Sales revenue @ ₹ 10 per unit**	**7,20,000.00**	**7,20,000.00**	**7,20,000.00**	**7,20,000.00**
[B] Less: Cost of Operation				
Material @ ₹ 2 per unit	1,44,000.00	1,44,000.00	1,44,000.00	1,44,000.00
Labour @ ₹ 30 per hour for [300 x 6] hours	54,000.00	54,000.00	54,000.00	54,000.00
Fixed overhead	60,000.00	60,000.00	60,000.00	60,000.00
Depreciation	2,16,800.00	1,73,440.00	1,38,752.00	1,11,001.60
Total Cost [B]	**4,74,800.00**	**4,31,440.00**	**3,96,752.00**	**3,69,001.60**
Profit Before Tax [A – B]	2,45,200.00	2,88,560.00	3,23,248.00	3,50,998.40
Less: Tax @ 30%	73,560.00	86,568.00	96,974.40	1,05,299.52
Profit After Tax	1,71,640.00	2,01,992.00	2,26,273.60	2,45,698.88
Add: Depreciation	2,16,800.00	1,73,440.00	1,38,752.00	1,11,001.60
Add: Release of Working Capital				2,00,000.00
Annual Cash Inflows	**3,88,440.00**	**3,75,432.00**	**3,65,025.60**	**5,56,700.48**

[iii] Calculation of Incremental Annual Cash Flow:

Particulars	**Year 1** [₹]	**Year 2** [₹]	**Year 3** [₹]	**Year 4** [₹]
Existing Machine [A]	1,29,440.00	1,24,832.00	1,21,145.60	2,18,196.48
New Machine [B]	3,88,440.00	3,75,432.00	3,65,025.60	5,56,700.48
Incremental Annual Cash Flow [B – A]	2,59,000.00	2,50,600.00	2,43,880.00	3,38,504.00

[iv] Calculation of Net Present Value on replacement of machine:

Year	Incremental Annual Cash Flow [₹] [A]	Discounting factor @ 10% [B]	Present Value of Incremental Annual Cash Flow [₹] [A x B]
1	2,59,000.00	0.909	2,35,431.000
2	2,50,600.00	0.826	2,06,995.600
3	2,43,880.00	0.751	1,83,153.880
4	3,38,504.00	0.683	2,31,198.232
Total Incremental Inflows			**8,56,778.712**
Less: Net Initial Cash Outflows [Working note]			8,00,000.000
Incremental NPV			**56,778.712**

Advice: Since the incremental NPV is positive, existing machine should be replaced.

Working Note:

Calculation of Net Initial Cash Outflows:

Particulars	₹
Cost of new machine	10,00,000
Less: Sale proceeds of existing machine	3,00,000
Add: incremental working capital required [₹ 2,00,000 – ₹ 1,00,000]	1,00,000
Net initial cash outflows	**8,00,000**

6.

Workings:

[i] Calculation of Annual Depreciation

Depreciation on Machine – A = = ₹ 2,00,000

Depreciation on Machine – B = = ₹ 1,50,000

[ii] Calculation of Annual Cash Inflows

Particulars	Machine-A [₹]			
	1	2	3	4
Net Profit before Depreciation and Tax	2,30,000	2,40,000	2,20,000	5,60,000
Less: Depreciation	2,00,000	2,00,000	2,00,000	2,00,000
Profit before Tax	30,000	40,000	20,000	3,60,000
Less: Tax @ 30%	9,000	12,000	6,000	1,08,000
Profit after Tax	21,000	28,000	14,000	2,52,000

Add: Depreciation	2,00,000	2,00,000	2,00,000	2,00,000
Annual Cash Inflows	2,21,000	2,28,000	2,14,000	4,52,000

Particulars	**Machine-B [₹]**			
	1	2	3	4
Net Profit before Depreciation and Tax	1,75,000	2,60,000	3,20,000	1,50,000
Less: Depreciation	1,50,000	1,50,000	1,50,000	1,50,000
Profit before Tax	25,000	1,10,000	1,70,000	0
Less: Tax @ 30%	7,500	33,000	51,000	0
Profit after Tax	17,500	77,000	1,19,000	0
Add: Depreciation	1,50,000	1,50,000	1,50,000	1,50,000
Annual Cash Inflows	1,67,500	2,27,000	2,69,000	1,50,000

[iii] Calculation of PV of Cash Flows

	Machine – A				**Machine - B**		
Year	PV of Re 1 @ 12%	Cash flow [₹]	PV [₹]	Cumulative PV [₹]	Cash flow [₹]	PV [₹]	Cumulative PV [₹]
1	0.893	2,21,000	1,97,353	1,97,353	1,67,500	1,49,578	1,49,578
2	0.797	2,28,000	1,81,716	3,79,069	2,27,000	1,80,919	3,30,497
3	0.712	2,14,000	1,52,368	5,31,437	2,69,000	1,91,528	5,22,025
4	0.636	4,52,000	2,87,472	8,18,909	1,50,000	95,400	6,17,425

1. **NPV [Net Present Value]**

   Machine – A NPV =₹ 8,18,909 - ₹ 8,00,000 = ₹ **18,909**

   Machine – B

   NPV = ₹ 6,17,425 – ₹ 6,00,000 = ₹ **17,425**

2. **Discounted Payback Period**

   Machine – A

   Discounted Payback Period = 3 + Rs.8,00,000 – Rs.5,31,437 / Rs.2,87,472

   = 3 + = 3 + 0.934

   = 3.934 years or 3 years 11.21 months

   Machine – B

   Discounted Payback Period = 3 + Rs.6,00,000 – Rs.5,22,025 / Rs.95,400

   = 3 + 0.817

   = 3.817 years or 3 years 9.80 months

3. **PI [Profitability Index]**

Machine – A

Profitability Index = Rs.8,18,909 / Rs.8,00,000 = 1.024

Machine – B

Profitability Index = Rs.6,17,425 / Rs.6,00,000 = 1.029

Suggestion:

Method	Machine - A	Machine - B	Suggested Machine
Net Present Value	₹ 18,909	₹ 17,425	**Machine A**
Discounted Payback Period	3.934 years	3.817 years	**Machine B**
Profitability Index	1.024	1.029	**Machine B**

7.

Calculation of Net Cash flows

Contribution = [₹ 6 – ₹ 3] x 1,00,000 units = ₹ **3,00,000**

Fixed costs [excluding depreciation] = ₹ 1,00,000

Year	Capital [₹]	Contribution [₹]	Fixed costs [₹]	Advertisement/ Maintenance expenses [₹]	Net cash flow [₹]
0	[2,50,000]				[2,50,000]
1		3,00,000	[1,00,000]	[20,000]	1,80,000
2		3,00,000	[1,00,000]		2,00,000
3		3,00,000	[1,00,000]		2,00,000
4		3,00,000	[1,00,000]		2,00,000
5		3,00,000	[1,00,000]	[30,000]	1,70,000
6		3,00,000	[1,00,000]		2,00,000
7		3,00,000	[1,00,000]		2,00,000
8		3,00,000	[1,00,000]		2,00,000

Calculation of Net Present Value

Year	Net cash flow [₹]	12% discount factor	Present value [₹]
0	[2,50,000]	1.000	[2,50,000]
1	1,80,000	0.893	1,60,740
2	2,00,000	0.797	1,59,400
3	2,00,000	0.712	1,42,400
4	2,00,000	0.636	1,27,200
5	1,70,000	0.567	96,390

6	2,00,000	0.507	1,01,400
7	2,00,000	0.452	90,400
8	2,00,000	0.404	80,800
			7,08,730

Advise: CK Ltd. should buy the new machine, as the net present value of the proposal is positive i.e ₹ 7,08,730.

8.

i] Calculation of NPV under three different scenarios [Amount in ₹]

Particulars	1st Scenario	2nd Scenario	3rd Scenario
Annual Cash Flow	50,000	1,00,000	1,50,000
PV of cash inflows [Annual Cash Flow × 4.33*]	2,16,500	4,33,000	6,49,500
PV of Residual Value [₹ 40,000 × 0.784]	31,360	31,360	31,360
Total PV of Cash Inflow	2,47,860	4,64,360	6,80,860
Initial investment	4,00,000	4,00,000	4,00,000
NPV	[1,52,140]	64,360	2,80,860

* .952 + .907 + .864 + .823 + .784 = 4.33

ii] Calculation of Expected Net present Value under three different scenarios

Particulars	1st Scenario	2nd Scenario	3rd Scenario	Total [₹]
Annual Cash Flow	₹ 50,000	₹ 1,00,000	₹ 1,50,000	
Probability 0	.3	0.3	0.4	
Expected Value	₹ 15,000	₹ 30,000	₹ 60,000	1,05,000
PV of Expected value [1,05,000 × 4.33]				4,54,650
PV of Residual Value [40,000 × 0.784]				31,360
Total PV of Cash Inflow				4,86,010
Initial investment				4,00,000
Expected Net Present Value				86,010

iii] Since the expected net present value of the Investment is positive, the Investment should be undertaken.

9.

Computation of initial cash outlay [COF]

	[₹ in lakhs]
Project Cost	240
Working Capital	30
	270

Calculation of Cash Inflows[CIF]:

Years	1	2	3-5	6-8
Sales in units	60,000	80,000	1,40,000	1,20,000
	₹	₹	₹	₹
Contribution [₹ 200 x 60% x No. of Unit]	72,00,000	96,00,000	1,68,00,000	1,44,00,000
Less: Fixed cost	30,00,000	30,00,000	30,00,000	30,00,000
Less: Advertisement	50,00,000	25,00,000	10,00,000	5,00,000
Less: Depreciation [24000000/8] = 30,00,000	30,00,000	30,00,000	30,00,000	30,00,000
Profit /[loss]	[38,00,000]	11,00,000	98,00,000	79,00,000
Less: Tax @ 25%	NIL	2,75,000	24,50,000	19,75,000
Profit/[Loss] after tax	[38,00,000]	8,25,000	73,50,000	59,25,000
Add: Depreciation	30,00,000	30,00,000	30,00,000	30,00,000
Cash inflow	[8,00,000]	38,25,000	1,03,50,000	89,25,000

[Note: Since variable cost is 40%, Contribution shall be 60% of sales]

Computation of PV of CIF

Year	CIF	PV Factor	₹
	₹	@ 10%	
1	[8,00,000]	0.909	[7,27,200]
2	38,25,000	0.826	31,59,450
3	1,03,50,000	0.751	77,72,850
4	1,03,50,000	0.683	70,69,050
5	1,03,50,000	0.621	64,27,350
6	89,25,000	0.564	50,33,700
7	89,25,000	0.513	45,78,525
8	89,25,000	0.467	55,68,975
Working Capital	30,00,000		
			3,88,82,700
	PV of COF		2,70,00,000
		NPV	**1,18,82,700**

Recommendation: Accept the project in view of positive NPV.

10.

Calculation of Net Cash flows

Contribution = [400 – 375] x 80,000 = ₹ 20,00,000

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

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

Calculation of Net Present Value

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

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

11.

Calculation of Cash Flow After tax

	Year	1	2	3 to 5	6 to 8
A	Capacity	20%	30%	75%	50%
B	Units	80000	120000	300000	200000
C	Contribution p.u.	₹60	₹60	₹60	₹60
D	Contribution	₹48,00,000	₹72,00,000	₹1,80,00,000	₹1,20,00,000
E	Fixed Cash Cost	₹16,00,000	₹16,00,000	₹16,00,000	₹16,00,000
Depreciation					
F	Original Equipment [₹240Lakhs/8]	₹30,00,000	₹30,00,000	₹30,00,000	₹30,00,000
G	Additional Equipment [₹24Lakhs/6]	--	--	₹4,00,000	₹4,00,000

H	Advertisement Expenditure	₹30,00,000	₹15,00,000	₹10,00,000	₹4,00,000
I	Profit Before Tax [D-E-F-G-H]	₹ [28,00,000]	₹11,00,000	₹1,20,00,000	₹66,00,000
J	Tax savings/ [expenditure]	₹14,00,000	₹ [5,50,000]	₹ [60,00,000]	₹ [33,00,000]
K	Profit After Tax	₹ [14,00,000]	₹5,50,000	₹60,00,000	₹33,00,000
L	Add: Depreciation [F+G]	₹30,00,000	₹30,00,000	₹34,00,000	₹34,00,000
M	Cash Flow After Tax	₹16,00,000	₹35,50,000	₹94,00,000	₹67,00,000

Calculation of NPV

Year	Particulars	Cash Flows	PV factor	PV
0	Initial Investment	₹ [2,40,00,000]	1.000	₹ [2,40,00,000]
0	Working Capital Introduced	₹ [25,00,000]	1.000	₹ [25,00,000]
1	CFAT	₹16,00,000	0.893	₹ 14,28,800
2	CFAT	₹ 35,50,000	0.797	₹ 28,29,350
2	Additional Equipment	₹ [26,00,000]	0.797	₹ [20,72,200]
3	CFAT	₹ 94,00,000	0.712	₹ 66,92,800
4	CFAT	₹ 94,00,000	0.636	₹ 59,78,400
5	CFAT	₹ 94,00,000	0.567	₹ 53,29,800
6	CFAT	₹ 67,00,000	0.507	₹ 33,96,900
7	CFAT	₹ 67,00,000	0.452	₹ 30,28,400
8	CFAT	₹ 67,00,000	0.404	₹ 27,06,800
8	WC Released	₹ 25,00,000	0.404	₹ 10,10,000
8	Salvage Value	₹ 2,00,000	0.404	₹ 80,800
Net Present Value				**₹39,09,850**

Since the NPV is positive, the proposed project should be implemented

12.

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= Sum of discounted cash inflows Present value of cash outflows = 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.

13.

ABC & 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 ⍰ 4.4873]	8,97,460
		26,97,460
	Less: PV of salvage value at the end of 8 years	
	[₹ 4,00,000⍰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	[5,71,992]	1.00	[5,71,992]
	0	8,00,000	1.00	8,00,000
				2,28,008
Replace in one year	1	[5,71,992]	0.8696	[4,97,404]
	1	[2,00,000]	0.8696	[1,73,920]
	1	5,00,000	0.8696	4,34,800
				[2,36,524]
Replace in two years	1	[2,00,000]	0.8696	[1,73,920]
	2	[5,71,992]	0.7561	[4,32,483]
	2	[4,00,000]	0.7561	[3,02,440]
	2	3,00,000	0.7561	2,26,830
				[6,82,013]
Replace in three years	1	[2,00,000]	0.8696	[1,73,920]
	2	[4,00,000]	0.7561	[3,02,440]
	3	[5,71,992]	0.6575	[3,76,085]
	3	[6,00,000]	0.6575	[3,94,500]
	3	2,00,000	0.6575	1,31,500
				[11,15,445]
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	[5,71,992]	0.5718	[3,27,065]
	4	[8,00,000]	0.5718	[4,57,440]
				[16,55,365]

Advice: The company should replace the old machine immediately because the PV of cost of replacing the old machine with new machine is least.

14.

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.

15.

Workings:

Calculation of Depreciation:

On Modernized Equipment = ₹1,40,000 - ₹30,000 / 5 years = ₹ 22,000 p.a.

On New machine = ₹3,50,000 - ₹60,000 / 5 years = ₹ 58,000 p.a.

[i] Calculation of Incremental annual cash inflows/ savings:

Particulars	Existing Equipment [₹]	Modernization		New Machine	
		Amount [₹]	Savings [₹]	Amount [₹]	Savings [₹]
	[1]	[2]	[3]=[1]-[2]	[4]	[5]=[1]-[4]
Wages & Salaries	45,000	35,500	9,500	15,000	30,000
Supervision	20,000	10,000	10,000	7,000	13,000
Maintenance	25,000	5,000	20,000	2,500	22,500
Power	30,000	20,000	10,000	15,000	15,000
Total	**1,20,000**	**70,500**	**49,500**	**39,500**	**80,500**
Less: Depreciation [Refer Workings]			22,000		58,000
Total Savings			**27,500**		**22,500**
Less: Tax @ 50%			13,750		11,250
After Tax Savings			**13,750**		**11,250**
Add: Depreciation			22,000		58,000
Incremental Annual Cash Inflows			**35,750**		**69,250**

[ii] Calculation of Net Present Value [NPV]

Particulars	Year	Modernization [₹]	New Machine [₹]
Initial Cash outflow [A]	0	1,40,000.00	3,50,000.00
Incremental Cash Inflows	1-5	1,35,492.50	2,62,457.50
		[₹ 35,750 x 3.790]	[₹ 69,250 x 3.790]
Salvage value	5	18,630.00 [₹ 30,000 x 0.621]	37,260.00 [₹ 60,000 x 0.621]
PV of Cash inflows [B]		1,54,122.50	2,99,717.50
Net Present Value [B - A]		14,122.50	[50,282.50]

Advise: The Company should modernize its existing equipment and not buy a new machine because NPV is positive in modernization of equipment.

16.

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 machinery [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:

i. Material stock increases are taken in cash flows.

ii. Idle time wages have also been considered.

iii. Apportioned factory overheads are not relevant only insurance charges of this project are relevant.

iv. Interest calculated at 14% based on 4 equal instalments of loan repayment.

v. Sale of machinery- Net income after deducting removal expenses taken. Tax on Capital gains ignored.

vi. Saving in contract payment and income tax thereon considered in the cash flows.

17.

[i] Calculation of Net Cash Flow

					[₹ in lakhs]
Year	**Profit before dep.and tax**	**Depreciation [20% on WDV]**	**PBT**	**PAT**	**Net cash flow**
[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[3] + [5]**
1	320	800 - 20% = 160	160	96	256
2	320	[800 - 160] x 20% = 128	192	115.20	243.20
3	360	[640 - 128] x 20% = 102.4	257.6	154.56	256.96
4	360	[512 - 102.4] x 20% = 81.92	278.08	166.85	248.77
5	300	[409.6 - 81.92] = 327.68*	-27.68	-16.61	311.07

*this is treated as a short term capital loss.

[ii] Calculation of Net Present Value [NPV]

							[₹ in lakhs]
Year	**Net Cash Flow**	**12%**		**16%**		**20%**	
		D.F	**P.V**	**D.F**	**P.V**	**D.F**	**P.V**
1	256	0.89	227.84	0.86	220.16	0.83	212.48
2	243.20	0.80	194.56	0.74	179.97	0.69	167.81
3	256.96	0.71	182.44	0.64	164.45	0.58	149.03
4	248.77	0.64	159.21	0.55	136.82	0.48	119.41
5	311.07	0.57	177.31	0.48	149.31	0.40	124.43
			941.36		850.71		773.16
	Less: Initial Investment		800.00		800.00		800.00
		NPV	141.36		50.71		-26.84

[iii] Advise: Since Net Present Value of the project at 12% = 141.36 lakhs, therefore the project should be implemented.

[iv] Calculation of Internal Rate of Return [IRR]

IRR = 16% + 50.71 x 4 / 50.71 - [- 26.84]

=16% + 2.03 / 77.55 =16% + 2.62% = 18.62%.

18.

Calculation of Net Cash flows

Contribution = [300 – 285] 75,000 = ₹11,25,000

Fixed costs = 8,40,000 – [[25,00,000 – 3,00,000]/5] = ₹4,00,000

Year	Capital [₹]	Contribution [₹]	Fixed costs [₹]	Adverts [₹]	Net cash flow [₹]
0	[20,00,000]				[20,00,000]
1	[5,00,000]	11,25,000	[4,00,000]	[1,00,000]	1,25,000
2		11,25,000	[4,00,000]	[1,50,000]	5,75,000
3		11,25,000	[4,00,000]		7,25,000
4		11,25,000	[4,00,000]		7,25,000
5	3,00,000	11,25,000	[4,00,000]		10,25,000

Calculation of Net Present Value

Year	Net cash flow [₹]	12% discount factor	Present value [₹]
0	[20,00,000]	1.000	[20,00,000]
1	1,25,000	0.892	1,11,500
2	5,75,000	0.797	4,58,275
3	7,25,000	0.711	5,15,475
4	7,25,000	0.635	4,60,375
5	10,25,000	0.567	5,81,175
			1,26,800

The net present value of the project is ₹1,26,800

19.

Since the life span of each machine is different and time span exceeds the useful lives of each model, we shall use Equivalent Annual Cost method to decide which brand should be chosen.

[i] If machine is used for 20 years

Present Value [PV] of cost if machine of Brand XYZ is purchased

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	6,00,000	1.000	6,00,000
1-5	20,000	3.605	72,100
6-10	28,000	2.045	57,260
11-15	39,000	1.161	45,279
15	[64,000]	0.183	[11,712]
			7,62,927

PVAF for 1-15 years 6.811

Equivalent Annual Cost = ₹7,62,927 / 6.811 = ₹ 1,12,014

Present Value [PV] of cost if machine of Brand ABC is purchased

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	4,50,000	1.000	4,50,000
1 - 5	31,000	3.605	1,11,755
6 -10	53,000	2.045	1,08,385
10	[57,000]	0.322	[18,354]
			6,51,786

PVAF for 1-10 years 5.65

Equivalent Annual Cost = ₹6,51,786 / 5.65 = ₹ 1,15,360

Present Value [PV] of cost if machine of Brand ABC is taken on Rent

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	1,02,000	1.000	1,02,000
1 - 4	1,02,500	3.037	3,11,293
5-9	1,09,950	2.291	2,51,895
			6,65,188

PVAF for 1-10 years 5.65

Equivalent Annual Cost = ₹6,65,188 / 5.65 = ₹ 1,17,732

Decision: Since Equivalent Annual Cash Outflow is least in case of purchase of Machine of brand XYZ the same should be purchased.

[ii] If machine is used for 5 years

[a] Scrap Value of Machine of Brand XYZ

= ₹ 6,00,000 – ₹ 2,00,000 – ₹ 6,00,000 × 0.04 × 4 = ₹ 3,04,000

[b] Scrap Value of Machine of Brand ABC

= ₹ 4,50,000 – ₹ 1,50,000 – ₹ 4,50,000 × 0.06 × 4 = ₹ 1,92,000

Present Value [PV] of cost if machine of Brand XYZ is purchased

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	6,00,000	1.000	6,00,000
1 - 5	20,000	3.605	72,100
5	[3,04,000]	0.567	[1,72,368]
			4,99,732

Present Value [PV] of cost if machine of Brand ABC is purchased

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	4,50,000	1.000	4,50,000

1-5	31,000	3.605	1,11,755
5 [	1,92,000]	0.567	[1,08,864]
			4,52,891

Present Value [PV] of cost if machine of Brand ABC is taken on Rent

Period	Cash Outflow [₹]	PVF@12%	Present Value
0	1,02,000	1.000	1,02,000
1-4	1,02,500	3.037	3,11,293
5	50,000	0.567	28,350
			4,41,643

Decision: Since Cash Outflow is least in case of lease of Machine of brand ABC the same should be taken on rent.

CHAPTER 5: DIVIDEND DECISIONS

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

Following information are given for a company:

Earnings per share	₹ 10
P/E ratio	12.5
Rate of return on investment	12%
Market price per share as per Walter's Model	₹ 130

You are required to calculate:

(i) Dividend payout ratio.

(ii) Market price of share at optimum dividend payout ratio.

(iii) P/E ratio, at which the dividend policy will have no effect on the price of share.

(iv) Market price of share at this P/E ratio.

Market price of share using Dividend growth model

PROBLEM – 2 [NOV 22]

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 Shares [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.

PROBLEM – 3 [NOV 21]

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

(i) Find out intrinsic value per share.

(ii) State whether shares are overpriced or underpriced.

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

PROBLEM – 4 [JULY 21]

The following information relates to LMN Ltd.

Earning of the company	₹ 30,00,000
Dividend pay-out ratio	60%
No. of shares outstanding	5,00,000
Rate of return on investment	15%
Equity capitalized rate	13%

Required:

(i) Determine what would be the market value per share as per Walter's model.

(ii) Compute optimum dividend pay-out ratio according to Walter's model and the market value of company's share at that pay-out ratio.

PROBLEM – 5 [JAN 21]

The following information is taken from ABC Ltd.

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

Calculate the market price of the share using:

(1) Gordon's Model

(2) Walter's Model

PROBLEM – 6 [NOV 20]

The following figures are extracted from the annual report of RJ Ltd.:

Net Profit	₹50 Lakhs
Outstanding 13% preference shares	₹200 Lakhs
No of Equity shares	6 Lakhs
Return on Investment	25%
Cost of Capital [Ke]	15%

You are required to compute the approximate dividend pay-out ratio by keeping the share price at ₹ 40 by using Walter's Model.

PROBLEM – 7 [NOV 19]

Following figures and information were extracted from the company A Ltd.

Earnings of the company	₹ 10,00,000
Dividend paid	₹ 6,00,000
No. of shares outstanding	2,00,000
Price Earnings Ratio	10
Rate of return on investment	20%

You are required to calculate:

(i) Current Market price of the share

(ii) Capitalisation rate of its risk class

(iii) What should be the optimum pay-out ratio?

(iv) What should be the market price per share at optimal pay-out ratio? [use Walter's Model]

PROBLEM – 8 [NOV 18; MAY 20]

Following information relating to Jee Ltd. are given:

Profit after tax	₹ 10,00,000
Dividend payout Ratio	50%
Number of Equity shares	50000
Cost of Equity	10%
Rate of return on investment	12%

(i) What would be the market value per share as per Walter's Model

(ii) What is the optimum dividend payout ratio according to Walter's Model and Market value of equity share at that payout ratio?

PART – B: [REVISION TEST PAPERS]

PROBLEM – 9 [RTP - NOV 23]

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

Mr. A collated following information:

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

(b) The company's sales are growing by 20% on a 5-year Compounded Annual Growth Rate [CAGR] basis, however the company expects following retention amounts against probabilities

mentioned as contention is dependent upon cash requirements for the company. Rate of return is 10% generated by the company.

Situation	Probability	Retention Ratio
A	30%	50%
B	40%	60%
C	30%	50%

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

PROBLEM – 10 [RTP - MAY 23]

Rambo Limited Has 1,00,000 equity shares outstanding for the year 2022. The current market price of the shares is ₹ 100 each. Company is planning to pay dividend of ₹ 10 per share. Required rate of return is 15%. Based on Modigliani-Miller approach, calculate the market price of the share of the company when the recommended dividend is 1] declared and 2] not declared. How many new shares are to be issued by the company at the end of the year on the assumption that net income for the year is ₹ 40 Lac and the investment budget is ₹ 50,00,000 when dividend is declared, or dividend is not declared.

PROOF that the market value of the company at the end of the accounting year will remain same whether dividends are distributed or not distributed.

PROBLEM – 11 [RTP - NOV 22]

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.

PROBLEM – 12 [RTP - MAY 22]

The following figures have been collected from the annual report of ABC Ltd. for the current financial year:

Net Profit	₹ 75 lakhs
Outstanding 12% preference shares	₹ 250 lakhs
No. of equity shares	7.50 lakhs
Return on Investment	20%
Cost of capital i.e. [Ke]	16%

(a) COMPUTE the approximate dividend pay-out ratio so as to keep the share price at ₹ 42 by using Walter's model?

(b) DETERMINE the optimum dividend pay-out ratio and the price of the share at such pay-out.

(c) PROVE that the dividend pay-out ratio as determined above in [b] is optimum by using random pay-out ratio.

PROBLEM – 13 [RTP - NOV 21]

Aakash Ltd. has 10 lakh equity shares outstanding at the start of the accounting year 2021. The existing market price per share is ₹ 150. Expected dividend is ₹ 8 per share. The rate of capitalization appropriate to the risk class to which the company belongs is 10%.

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

(ii) CALCULATE number of shares to be issued by the company at the end of the accounting year on the assumption that the net income for the year is ₹ 3 crore, investment budget is ₹ 6 crores, when [a] Dividends are declared, and [b] Dividends are not declared.

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

PROBLEM – 14 [RTP – MAY 21]

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) ANALYSE 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.

PROBLEM – 15 [RTP - NOV 20]

The following information is given for QB Ltd.

Earnings per share₹ 120

Dividend per share ₹ 36

Cost of capital 15%

Internal Rate of Return on investment 20%

CALCULATE the market price per share using

(a) Gordon's formula

(b) Walter's formula

PROBLEM – 16 [RTP - NOV 19]

The following information pertains to SD Ltd.

Earnings of the Company	₹ 50,00,000
Dividend Payout ratio	60%
No. of shares outstanding	10,00,000
Equity capitalization rate	12%
Rate of return on investment	15%

(i) COMPUTE the market value per share as per Walter's model?

(ii) COMPUTE the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?

PROBLEM – 17 [RTP - MAY 19]

The following figures are collected from the annual report of XYZ Ltd.:

Net Profit	₹30 lakhs
Outstanding 12% preference shares	₹100 lakhs
No. of equity shares	3 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] 25%;

[ii] 50% and

[iii] 100%.

ANSWERS

1.

[i] The EPS of the firm is ₹ 10, r =12%. The P/E Ratio is given at 12.5 and the cost of capital [Ke] may be taken as the inverse of P/E ratio. Therefore, Ke is 8% [i.e., 1/12.5].

The value of the share is ₹ 130 which may be equated with Walter Model as follows:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} \text{ or } P = \frac{D + \frac{12\%}{8\%}(10 - D)}{8\%}$$

or [D+1.5[10-D]]/0.08=130

or D+15-1.5D=10.4

or -0.5D=-4.6

So, D = ₹ 9.2

The firm has a dividend pay-out of 92% [i.e., 9.2/10].

[ii] Since the rate of return of the firm [r] is 12% and it is more than the Ke of 8%, therefore, by distributing 92% 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:

$$P = \frac{0 + \frac{12\%}{8\%}(10 - 0)}{8\%}$$

P = ₹ 187.5

So, theoretically the market price of the share can be increased by adopting a zero pay-out.

[iii] The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the Ke would be equal to the rate of return [r] of the firm. The K_e would be 12% [= r] at the P/E ratio of 1/12%=8.33. Therefore, at the P/E ratio of 8.33, the dividend policy would have no effect on the value of the share.

[iv] If the P/E is 8.33 instead of 12.5, then the Ke which is the inverse of P/E ratio, would be 12% and in such a situation ke= r and the market price, as per Walter's model would be:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} \text{ or } P = \frac{9.2 + \frac{0.12}{0.12}(10 - 9.2)}{0.12} = ₹ 83.33$$

[v] Dividend Growth Model applying growth on dividend

Ke = 8%, r = 12%, D0 = 9.2, b = 0.08

g = b.r

g = 0.08 x 0.12 = 0.96%

D1 = D0 [1+g] = 9.2 [1+0.0096] = ₹ 9.2883

P = D1 / [Ke − g] = 9.2883/[0.08 – 0.0096] = 9.2883/0.0704 = ₹ 131.936

Alternative

Alternatively, without applying growth on dividend

$$P = = \frac{E(1-b)}{K_e - br} = \frac{10(1-0.08)}{0.08-(0.08\times 0.12)} = Rs.130.68$$

2.

Computation of WACC on the basis of market value

W.N. 1

Cum-dividend price of Preference shares = ₹ 18

Less: Dividend [8/100] x 25 = ₹ 2

Market Price of Preference shares = ₹ 16

K_p = 2 / 16 = 0.125 [or] 12.5%

No. of Preference shares = [4,00,000 / 25] = 16,000

W.N. 2

Market price of Debentures = [120 / 100] x 100 = ₹ 120

K_d = [12 [1 – 0.3] / 120] = 0.07 [or] 7%

No. of Debentures = [6,00,000 / 100] = 6,000

W.N.3

Market Price of Equity shares = ₹ 39

Ke [given] = 19% or 0.19

No. of Equity shares = 5,00,000 / 10 = 50,000

Sources	Market Value [₹]	Nos. Total	Market value [₹]	Weight	Cost of Capital	Product
Equity Shares	39	50,000	19,50,000	0.6664	0.19	0.1266
Preference Shares	16	16,000	2,56,000	0.0875	0.125	0.0109
Debenture s	120	6,000	7,20,000	0.2461	0.07	0.0172
					WACC =	0.1547

WACC = 0.1547 or 15.47%

3.

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

$P= D1 / [1+Ke]^1 + D2 / [1+Ke]^2 + D3 / [1+Ke]^3 + D4 / [1+Ke]^4 + D4 [1+g] / [Ke-g] \times 1 / [1+Ke]^4$

Where,

P = Price per share

K_e = Required rate of return on equity

g = Growth rate

$P= ₹ 140 \times 1.12 / [1 + 0.18]^1 + ₹ 156.80 \times 1.12 / [1 + 0.18]^2 + ₹ 175.62 \times 1.12 / [1 + 0.18]^3 + ₹ 196.69 \times 1.12 / [1 + 0.18]^4 + ₹ 220.29 [1 + 0.05] / [0.18 - 0.05] \times 1 / [1 + 0.18]^4$

P = **132.81 + 126.10 + 119.59 + 113.45 + 916.34 = ₹ 1,408.29**

Intrinsic value of share is ₹ 1,408.29 as compared to latest market price of ₹ 2,185. Market price of share is over-priced by ₹ 776.71

4.

[i] Calculation of market value per share as per Walter's model

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

Where,

P = Market price per share.

E = Earnings per share = ₹ 30,00,000/5,00,000 = ₹ 6

D = Dividend per share = ₹ 6 x 0.60 = ₹ 3.6

r = Return earned on investment = 15%

Ke = Cost of equity capital = 13%

$$P = \frac{3.6 + \frac{0.15}{0.13}(6 - 3.6)}{0.13} = Rs.49$$

[ii] According to Walter's model, when the return on investment [r] is more than the cost of equity capital [Ke], 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:

$$P = \frac{0 + \frac{0.15}{0.13}(6 - 0)}{0.13} = Rs.53.254$$

5.

Market price per share by-

[1] Gordon's Model:

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

OR

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

Where,

Po = Present market price per share.

g = Growth rate [br] = 0.75 X 0.22 = 0.165

b = Retention ratio [i.e., % of earnings retained]

r = Internal rate of return [IRR]

D0 = E x [1 – b] = 3 X [1 – 0.75] = 0.75

E = Earnings per share Po =0.75 [10.165] / 0.18 - 0.165 = 0.874 / 0.015= ₹ 58.27 approx.

*Alternatively, Po can be calculated as E[1 - b] / k - br= ₹ 50.

[2] Walter's Model:

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = \frac{0.75 + \frac{0.22}{0.18}(3 - 0.75)}{0.18} = Rs.19.44$$

Workings:

1. Calculation of Earnings per share

Particulars	Amount [₹]
Net Profit for the year	30,00,000
Less: Preference dividend [12% of ₹ 1,00,00,000]	[12,00,000]
Earnings for equity shareholders	18,00,000
No. of equity shares [₹ 60,00,000/₹ 10]	6,00,000
Therefore, Earnings per share [Earning for equity shareholders / No. of equity shares] ₹	18,00,000 / 6,00,000 = ₹ 3.00

2. Calculation of Dividend per share

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

6.

Particulars	₹ in lakhs
Net Profit	50
Less: Preference dividend [₹ 200,00,000 x 13%]	26
Earning for equity shareholders	24
Therefore, earning per share = ₹ 24 lakh /6 lakh shares =	₹ 4

Let, the dividend per share be D to get share price of ₹ 40

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

$$Rs.40 = \frac{D + \frac{0.25}{0.18}(Rs.4 - D)}{0.15}$$

$$6 = \frac{0.15D + 1 - 0.25D}{0.15}$$

0.1D = 1 – 0.9

D = Rs.1

D/P ratio = DPS / EPS x 100 = Rs.1 / Rs.4 x 100 = 25%

So, the required dividend pay-out ratio will be = 25%

7.

[i] Current Market price of shares [applying Walter's Model]

- The EPS of the firm is ₹ 5 [i.e., Rs 10,00,000 / 2,00,000].
- Rate of return on Investment [r] = 20%.
- The Price Earnings [P/E] Ratio is given as 10, so capitalization rate [Ke], may be taken at the inverse of P/E Ratio. Therefore, Ke is 10% or .10 [i.e., 1/10].
- The firm is distributing total dividends of ₹ 6,00,000 among 2,00,000 shares, giving a dividend per share of ₹ 3.

The value of the share as per Walter's model may be found as follows:

Walter's model is given bye

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

Where,

P = Market price per share.

E = Earnings per share = ₹ 5

D = Dividend per share = ₹ 3

R = Return earned on investment = 20 %

Ke = Cost of equity capital = 10% or .10

$$P = \frac{3 + \frac{0.20}{0.10}(5 - 3)}{0.10} = Rs.70$$

Current Market Price of shares can also be calculated as follows:

Price Earnings [P/E] Ratio = Market Price of Share / Earnings per Shares

Or, 10 = Market Price of Share / ₹ 10,00,000 / 2,00,000

Or, 10 = Market Price of Share / ₹ 5

Market Price of Share = ₹ 50

[ii] Capitalization rate [Ke] of its risk class is 10% or .10 [i.e., 1/10].

[iii] Optimum dividend pay-out ratio

According to Walter's model when the return on investment is more than the cost of equity capital [10%], the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil or 0 [zero].

[iv] Market price per share at optimum dividend pay-out ratio

At a pay-out ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + \frac{0.20}{0.10}(5-0)}{0.10} = \text{Rs.}100$$

8.

[i] Walter's model is given by –

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

Where,

P = Market price per share,

E = Earnings per share = ₹ 10,00,000 ÷ 50,000 = ₹ 20

D = Dividend per share = 50% of 20 = ₹ 10

r = Return earned on investment = 12%

K_e = Cost of equity capital = 10%

$$\therefore\ P = \frac{10 + (20-10)\times\frac{0.12}{0.10}}{0.10} = \frac{22}{0.10} = ₹\ 220$$

[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 payout ratio of zero, the market value of the company's share will be:-

$$P = \frac{10 + (20-0)\times\frac{0.12}{0.10}}{0.10} = \frac{24}{0.10} = ₹\ 240$$

9.

Market price using Gordon's formula

$P_0 = D_o [1 + g] / K_e - g$

$D_0 = 2.5 \times 4 = 10$ per share [annual]

g = br or retention ratio x rate of return

Calculation of expected retention ratio

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

g = 0.54 × 0.10 = 0.054 or 5.4%

$P_0 = D_o [1 + g] / K_e - g$

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

K_e = Risk free rate + [Beta x Risk Premium]

= 3.75% + [1.2 x 4.25%] = 8.85%

10.

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

Step 1: Calculate price at the end of the period

Ke = 15%, P_o = ₹ 100, D_1 = 0

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

$$₹\ 100 = \frac{P_1 + 0}{1+0.15}$$

P_1 = ₹ 115

Step 2: Calculation of funds required for investment

Earning	₹ 40,00,000
Dividend distributed	Nil
Fund available for investment	₹ 40,00,000
Total Investment	₹ 50,00,000
Balance Funds required	₹ 50,00,000 - ₹ 40,00,000 = ₹10,00,000

Step 3: Calculation of No. of shares required to be issued for balance funds

No. of shares = Funds required/P1

Δn = ₹ 10,00,000/₹ 115

Step 4: Calculation of value of firm

$nP_o = [[n+\Delta n]P1-I+E]/[1+Ke]$

nP_o = [[100000+1000000/₹ 115] ₹ 115 - ₹ 5000000 + ₹ 4000000]/[1.15]

= ₹ 1,00,00,000

CASE 2: Value of the firm when dividends are paid.

Step 1: Calculate price at the end of the period

Ke= 15%, P_o= ₹ 100, D_1= ₹ 10

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

$$₹\ 100 = \frac{P_1 + 10}{1 + 0.15}$$

P_1 = ₹ 105

Step 2: Calculation of funds required for investment

Earning	₹ 40,00,000
Dividend distributed	10,00,000
Fund available for investment	₹ 30,00,000
Total Investment	₹ 50,00,000
Balance Funds required	₹ 50,00,000 - ₹ 30,00,000 = ₹ 20,00,000

Step 3: Calculation of No. of shares required to be issued for balance fund

No. of shares = Funds Required/P1

Δn = ₹ 2000000/₹ 105

Step 4: Calculation of value of firm

nP_o = [[n+Δn]P1 – I+E]/[1+Ke]

nP_o = [[100000 + 2000000/₹ 105] ₹ 105 – ₹ 5000000 + ₹ 4000000]/[1.15]= ₹ 1,00,00,000

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

11.

P_0 = ₹ 10 n = 2,00,000, E = ₹ 5,00,000

K_e = 15%, Δn = 26,089, I = ?

$$P_0 = \frac{P_1}{1 + K_e}$$

$$10 = \frac{P_1}{1.15}$$

∴ P1 = 11.5

$$\Delta n = \frac{I - E + nD_1}{P_1}$$

26,089 = I - 5,00,000 / 11.5

I = 8,00,024

Now,

P0 = ₹ 10, n = ₹ 2,00,000,

E = ₹ 5,00,000, I = 8,00,024,

Ke = 15%, Δn 47,619, D1 = ?

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

$$10 = \frac{P_1 + D_1}{1.15}$$

$P_1 + D_1 = 11.5$

$\therefore$ P1 = 11.5 - D1 1

$$\because \Delta n = \frac{I - E + nD_1}{P_1}$$

47,619 = 8,00,024-5,00,000+2,00,000D_1 / P_1

47,619 P_1 = 2,00,000 D1 + 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

$\therefore$ 2,47,594.5 = 2,00,000D1 + 47,619 D1

$\therefore$ 2,47,594.5 = 2,47,619 D1

$\therefore$ D1 = 2,47,594.5 / 2,47,619 = 0.99 $\approx$ ₹ 1

$\therefore$ P1 = 11.5 – D1

P1 = 11.5 – 1 P1 = 10.5

$$\because N.P_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

= [2,00,000+47,619][10.5]-8,00,024+5,00,000 / 1.15

n.P0 = ₹ 19,99,979 $\approx$ ₹ 20,00,000

Using direct calculation,

n.P_0 = 2,00,000 ×10 = ₹ 20,00,000

12.

[a]

	₹ in lakhs
Net Profit	75
Less: Preference dividend	30
Earning for equity shareholders	45
Earning per share	= 45/7.5 = ₹ 6.00

Let, the dividend per share be D to get share price of ₹ 42

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

$$Rs.42 = \frac{D + \frac{0.20}{0.16}(6 - D)}{0.16}$$

$$6.72 = \frac{0.16D + 1.2 - 0.20D}{0.16}$$

$$0.04D = 1.2 - 1.0752$$

$$D = 3.12$$

$$D/P \text{ ratio} = \frac{DPS}{EPS} \times 100 = \frac{3.12}{6} \times 100 = 52\%$$

So, the required dividend payout ratio will be = 52%

[b] Since r > Ke, the optimum dividend pay-out ratio would 'Zero' [i.e. D = 0],

Accordingly, value of a share:

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

$$P = \frac{0 + \frac{0.20}{0.16}(6 - 0)}{0.16} = ₹ 46.875$$

[c] The optimality of the above pay-out ratio can be proved by using 25%, 50%, 75% and 100% as pay- out ratio:

At 25% pay-out ratio

$$P = \frac{1.5 + \frac{0.20}{0.16}(6 - 1.5)}{0.16} = Rs.44.531$$

At 50% pay-out ratio

$$P = \frac{3 + \frac{0.20}{0.16}(6 - 3)}{0.16} = Rs.42.188$$

At 75% pay-out ratio

$$P = \frac{4.5 + \frac{0.20}{0.16}(6 - 4.5)}{0.16} = Rs.39.844$$

At 100% pay-out ratio

$$P = \frac{6 + \frac{0.20}{0.16}(6 - 6)}{0.16} = Rs.37.50$$

From the above it can be seen that price of share is maximum when dividend pay-out ratio is 'zero' as determined in [b] above.

13.

[i] Calculation of market price per share

According to Miller – Modigliani [MM] Approach:

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

Where,

Existing market price [Po] = ₹ 150

Expected dividend per share [D1] = ₹ 8

Capitalization rate [ke] = 0.10

Market price at year end [P1] = to be determined

[a] If expected dividends are declared, then

₹ 150 = P_1 + 8 / 1 + 0.10

∴ P_1 = ₹ 157

[b] If expected dividends are not declared, then

₹ 150 = P_1 + 0 / 1 + 0.10

∴ P_1 = ₹ 165

[ii] Calculation of number of shares to be issued

	[a]	**[b]**
	Dividends are declared [₹ lakh]	**Dividends are not Declared [₹ lakh]**
Net income	300	300
Total dividends	[80]	-
Retained earnings	220	300
Investment budget	600	600
Amount to be raised by new issues	380	300
Relevant market price [₹ per share]	157	165
No. of new shares to be issued [in lakh] [₹ 380 ÷ 157; ₹ 300 ÷ 165]	2.42	1.82

[iii] Calculation of market value of the shares

	[a]	**[b]**
	Dividends are declared	**Dividends are not Declared**
Existing shares [in lakhs]	10.00	10.00

New shares [in lakhs]	2.42	1.82
Total shares [in lakhs]	12.42	11.82
Market price per share [₹]	157	165
Total market value of shares at the end of the year [₹ in lakh]	12.42 × 157 = 1,950 [approx.]	11.82 × 165 = 1,950 [approx.]

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

14.

[i] The EPS of the firm is ₹ 10 [i.e., ₹ 2,00,000/ 20,000] and r = 2,00,000/ [20,000 shares × ₹ 100] = 10%. The P/E Ratio is given at 12.5 and the cost of capital, Ke, may be taken at the inverse of 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:

$$P = = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = = \frac{7.5 + \frac{0.1}{0.08}(10 - 7.5)}{0.08} = ₹ 132.81$$

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 Ke would be equal to the rate of return, r, of the firm. The Ke 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 ke> r and the market price, as per Walter's model would be:

$$P = = \frac{D + \frac{r}{K_e}(E - D)}{K_e} = = \frac{7.5 + \frac{0.1}{0.125}(10 - 7.5)}{0.125} = ₹ 76$$

15.

[a] As per Gordon's Model, Price per share is computed using the formula:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Where,

P0 = Price per share

E1 = Earnings per share

b = Retention ratio; [1 - b = Pay-out ratio]

Ke = Cost of capital

r = IRR

br = Growth rate [g]

Applying the above formula, price per share

[b] As per Walter's Model, Price per share is computed using the 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.

Ke = Cost of equity/ rate of capitalization/ discount rate.

r = Internal rate of return/ return on investment

Applying the above formula, price per share P =

$$P = \frac{36 + \frac{0.20}{0.15}(120-36)}{0.15} = ₹\ 986.67$$

Or, $P = \frac{36+112}{0.15} = \text{Rs.}986.67$

16.

[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%

K_e = Cost of equity capital = 12%

$$P = \frac{3+\frac{0.15}{0.12}(5-3)}{0.12} = \text{Rs.45.83}$$

[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:

$$P = \frac{0+\frac{0.15}{0.12}(5-0)}{0.12} = \text{Rs.52.08}$$

17.

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = ₹ 6.00

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, E1 = 6, Ke = 16%

[i] When dividend pay-out is 25%

$$P_0 = \frac{6 \times 0.25}{0.16-(0.75 \times 0.2)} = \frac{1.5}{0.16-0.15} = 150$$

[ii] When dividend pay-out is 50%

$$P_0 = \frac{6 \times 0.5}{0.16-(0.5 \times 0.2)} = \frac{3}{0.16-0.10} = 50$$

[iii] **When dividend pay-out is 100%**

$$P_0 = \frac{6 \times 1}{0.16-(0 \times 0.2)} = \frac{6}{0.16} = 37.50$$

CHAPTER 6: RATIO ANALYSIS

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

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

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

Assume 360 days in a year.

You are required to complete Balance Sheet as on 31stMarch, 2023.

Balance Sheet as on 31stMarch, 2023.

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

PROBLEM – 2 [NOV 22]

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

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

The goods are sold to customers at a margin of 50% on the direct cost Tax Rate is 30%

You are required to calculate

(i) Net profit margin

(ii) Net operating profit margin

(iii) Return on assets

(iv) Return on owner's equity

PROBLEM – 3 [MAY 22]

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

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

You are required to calculate:

(i) Shareholders' Fund

(ii) Stock

(iii) Debtors

(iv) Current liabilities

(v) Cash Balance.

PROBLEM – 4 [NOV 21]

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

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

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

Accounts payable		Cash	
Total	50,00,000	Total	

Required:

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

PROBLEM – 5 [JULY 21]

Masco Limited has furnished the following ratios and information relating to the year ended 31st March 2021:

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

You are required to:

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

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

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

PROBLEM – 6 [JAN 21]

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

[i] Equity Share Capital :	₹ 2,00,000
[ii] Total debt to owner's equity :	0.75
[iii] Total Assets turnover:	2 times

[iv] Inventory turnover :	8 times
[v] Fixed Assets to owner's equity :	0.60
[vi] Current debt to total debt :	0.40

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

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

PROBLEM – 7 [NOV 20]

Following information relates to RM Co. Ltd.

	[₹]
Total Assets employed	10,00,000
Direct Cost	5,50,000
Other Operating Cost	90,000

Goods are sold to the customers at 150% of direct costs. 50% of the assets being financed by borrowed capital at an interest cost of 8% per annum. Tax rate is 30%.

You are required to calculate :

(i) Net profit margin

(ii) Return on Assets

(iii) Asset turnover

(iv) Return on owners' equity

PROBLEM – 8 [NOV 19]

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

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

Calculate the following:

(i) Return on Capital Employed

(ii) Earnings per share

(iii) PE ratio

PROBLEM – 9 [NOV 18]

The following is the information of XML Ltd. relate to the year ended 31-03-2018 :

Gross Profit	20% of Sales
Net Profit	10% of Sales
Inventory Holding period	3 months
Receivable collection period	3 months
Non-Current Assets to Sales	1 : 4
Non-Current Assets to Current Assets	1 : 2
Current Ratio	2 : 1
Non-Current Liabilities to Current Liabilities	1 : 1
Share Capital to Reserve and Surplus	4 : 1
Non-current Assets as on 31st March, 2017	₹50,00,000

Assume that:

(i) No change in Non-Current Assets during the year 2017-18

(ii) No depreciation charged on Non-Current Assets during the year 2017-18.

(iii) Ignoring Tax

You are required to Calculate cost of goods sold, Net profit, Inventory, Receivables and Cash for the year ended on 31st March, 2018

PART – B: [REVISION TEST PAPERS]

PROBLEM – 10 [RTP - NOV 23]

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

Ratios	2021	2022	Average of Chemical Industry
Liquidity Ratios			
Current ratio	2.1	2.3	2.4
Quick ratio	1.4	1.8	1.4
Receivable turnover ratio	8	9	8
Inventory turnover	8	9	5
Receivables collection period	46 days	41 days	46 days
Operating profitability			
Operating income –ROI	24%	21%	18%
Operating profit margin	18%	18%	12%

Financing decisions			
Debt ratio	45%	44%	60%
Return			
Return on equity	26%	28%	18%

COMMENT on the following aspect of Prabhu Chemicals Limited

(i) Liquidity

(ii) Operating profits

(iii) Financing

(iv) Return to the shareholders

PROBLEM – 11 [RTP - MAY 23]

From the following information, find out missing figures and REWRITE the balance sheet of Mukesh Enterprise.

Current Ratio = 2:1

Acid Test ratio = 3:2

Reserves and surplus = 20% of equity share capital

Long term debt = 45% of net worth

Stock turnover velocity = 1.5 months

Receivables turnover velocity = 2 months

You may assume closing Receivables as average Receivables.

Gross profit ratio = 20%

Sales is ₹ 21,00,000 [25% sales are on cash basis and balance on credit basis]

Closing stock is ₹ 40,000 more than opening stock.

Accumulated depreciation is 1/6 of original cost of fixed assets.

Balance sheet of the company is as follows:

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

PROBLEM – 12 [RTP - NOV 22]

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

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

You are required to PREPARE-

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

Particulars		[₹]	Particulars		[₹]
To	Direct Materials consumed	?	By	Sales	?
To	Direct Wages	?			
To	Works [Overhead]	?			
To	Gross Profit c/d	?			
		?			?
To	Selling and Distribution Expenses	?	By	Gross Profit b/d	?
To	Net Profit	?			
		?			?

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

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

PROBLEM – 13 [RTP - MAY 22]

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

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

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

DETERMINE:

(i) Sales and cost of goods sold

(ii) Sundry Debtors

(iii) Closing Stock

(iv) Sundry Creditors

(v) Fixed Assets

PROBLEM – 14 [RTP - NOV 21]

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

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

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

(i) Return on Capital Employed

(ii) Earnings Per share

(iii) P/E Ratio

PROBLEM – 15 [RTP - MAY 21]

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

Particulars	[₹ in crores]
Fixed Assets	5.20
Current Liabilities	4.68
Current Assets	7.80
Sales	23.00
EBIT	2.30

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

[₹ in crores]

Financing Policy	Short term debt @ 12%	Long term debt @ 16%	Total
Conservative	1.08	2.24	3.32
Moderate	2.00	1.32	3.32
Aggressive	3.00	0.32	3.32

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

(i) Return on total assets

(ii) Return on owner's equity

(iii) Net Working capital

(iv) Current Ratio

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

PROBLEM – 16 [RTP - NOV 20]

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

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

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

PROBLEM – 17 [RTP - MAY 20]

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

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

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

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

Required:

CALCULATE for the year 2019-20-

(a) Inventory turnover ratio

(b) Financial Leverage

(c) Return on Capital Employed [ROCE]

(d) Return on Equity [ROE]

(e) Average Collection period. [Take 1 year = 365 days]

PROBLEM – 18 [RTP - NOV 19]

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

Trading and Profit & Loss Account

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

Balance Sheet as on…….

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

You are required to COMPUTE:

1. Gross profit ratio
2. Net profit ratio
3. Operating cost ratio
4. Operating profit ratio
5. Inventory turnover ratio
6. Current ratio
7. Quick ratio
8. Interest coverage ratio
9. Return on capital employed
10. Debt to assets ratio.

PROBLEM – 19 [RTP - MAY 19]

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

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

COMMENT on the following aspect of R. Textiles Limited

(i) Liquidity

(ii) Operating profits

(iii) Financing

(iv) Return to the shareholders

ANSWERS

1.

[i] Current Ratio = 4

Current Assets / Current Liabilities = 4

∴ Current Assets / 3,10,000 = 4

∴ Current Assets = ₹ 12,40,000

[ii] Acid Test Ratio = 2.5

Current Assets – Inventory / Current Liabilities = 2.5

∴ 12,40,000 –Inventory / 3,10,000 = 2.5

∴ 12,40,000 – Inventory = ₹ 7,75,000

Inventory = ₹ 4,65,000

[iii] Inventory Turnover Ratio [on Sales] = 6

Sales / Inventory = 6

Sales / 4,65,000 = 6

∴ Sales = ₹ 27,90,000

[iv] Debtors Collection Period = 70 days

∴ [Debtors / sales] x 360 = 70

∴ [Debtors / 27,90,000] x 360 = 70

Debtors = ₹ 5,42,500

[v] Total Assets Turnover Ratio [on Sales] = 0.96

∴ Sales / Total Assets = 0.96

∴ 27,90,000 / Total Assets = 0.96

Total Assets = ₹ 29,06,250

[vi] Fixed Assets [FA] = Total Assets – Current Assets

= 29,06,250 – 12,40,000

Fixed Assets = ₹ 16,66,250

[vii] Cash Ratio = Cash / Current Liabilities = 0.43

∴ Cash / 3, 10,000 = 0.43

∴ Cash = ₹ 1,33,300

[viii] Proprietary Ratio = Proprietary Fund / Total Assets = 0.48

∴Proprietary Fund / 29,06,250 = 0.48

∴ Proprietary Fund = ₹ 13,95,000

[ix] Equity Dividend Coverage Ratio = 1.6

Or EPS /DPS = 3.5 / DPS

∴ DPS = ₹ 2.1875

DPS = Total Dividend / Number of Equity Shares

∴2.1875 = 1,75,000 / Number of Equity Shares

∴ Number of Equity Shares = 80,000

∴ Equity Share Capital = 80,000 x 10 = ₹ 8,00,000

∴ Reserves &Surplus = 13,95,000 - 8,00,000 = ₹ 5,95,000

[x] Loans and Advances = Current Assets - [Inventory + Receivables + Cash & Bank]

= ₹ 12,40,000 - [₹ 4,65,000 + 5,42,500 + 1,33,300] = ₹ 99,200

Balance Sheet as on 31st March 2023

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

2.

[i] Computation of Net Profit Margin

Debt = [10,00,000 x 50%] = ₹ 5,00,000

Interest cost = 5,00,000 x 10 / 100 = ₹ 50,000

Direct cost = 50,000 x 10 = ₹ 5,00,000

Sales = 5,00,000 x 150% = ₹ 7,50,000

	[₹]
Gross profit = 7,50,000 – 5,00,000	= 2,50,000
Less: Operating expenses	= 1,00,000
∴ EBIT	= 1,50,000
Less: Interest	= 50,000
∴ EBT	= 1,00,000
Less: Tax @ 30%	= 30,000
∴ PAT	= 70,000

Net profit margin = [70,000 / 7,50,000] x 100 = 9.33%

[ii] Net Operating Profit margin

Net operating profit margin = [EBIT / Sales] x 100

= [1,50,000 / 7,50,000] x 100 = 20%

[iii] Return on Assets

Return on Assets = [[PAT + Interest / Total Assets]] x 100

= [[1,20,000 / 10,00,000]] x 100] = 12%

[OR]

Return on Assets = EBIT / Assets ×100

= 1,50,000 10,00,000 ×100 = 15%

[OR]

= 70,000 / 10,00,000 x 100 = 7%

[OR]

= [1,50,000 [1-0.3] / 10,00,000] x 100 = 10.5%

[iv] Return on owner's equity

Return = [PAT / Owner's equity] x 100

= [70,000 / 5,00,000] x 100 = 14%

3.

[i] Calculation of Shareholders' Fund:

Reserve & Surplus / Shareholders' Funds = 0.5

Reserve & Surplus / Equity Share Capital + Reserve & Surplus = 0.5

Reserve & Surplus / 10,00,000 + Reserve & Surplus = 0.5

Reserve & Surplus = 5,00,000 + 0.5 Reserve & Surplus

0.5 Reserve & Surplus = 5,00,000

Reserve & Surplus = 10,00,000

Shareholders' funds = 10,00,000 +10,00,000

Shareholders' funds = ₹ 20,00,000

[ii] Calculation of Value of Stock:

Sales/' Shareholders' Funds = 1.5

Sales = 1.5 × 20,00,000

Sales = 30,00,000

Gross Profit = 30,00,000 × 20% = 6,00,000

Cost of Goods Sold = 30,00,000 – 6,00,000

= ₹ 24,00,000

Stock velocity = 2 months

Average Stock / Cost of Goods Sold x 12 = 2

Average Stock / 24,00,000x 12 = 2

Average Stock = 24,00,000 x 2 / 12

Average stock = ₹ 4,00,000

[iii] Calculation of Debtors:

Debtors Turnover Ratio = 6

∴ Sales / Average Debtor = 6

∴ 30,00,000 / Average Debtor = 6

Average Debtors = ₹ 5,00,000

[iv] Calculation of Current Liabilities:

Net Working Capital Turnover ratio = 2.5

Sales/ Current Assets −Current Liabilites = 2.5

30,00,000 / Current Assets −Current Liabilites = 2.5

Current Assets – Current Liabilities = 12,00,000 …….. [1]

Current Ratio = 2.5

Current Assets / Current Liabilities = 2.5

Current Assets = 2.5 Current Liabilities ……..[2]

From [1] & [2],

2.5 Current Liabilities – Current Liabilities = 12,00,000

1.5 Current Liabilities = 12,00,000

Current Liabilities = ₹ 8,00,000

[v] Calculation of Cash Balance:

Current Assets = 2.5 Current Liabilities

Current Assets = 2.5 [8,00,000]	= 20,00,000
[-] Debtors	[5,00,000]
[-] Stock	[4,00,000]
Cash Balance	₹ 11,00,000

4.

Working Notes:

[1] Total liability = Total Assets	= ₹ 50,00,000
Debt to Total Asset Ratio	= 0.40
Debt / Total Assets	= 0.40
Or, Debt / 50,00,000	= 0.40
So, **Debt**	**= 20,00,000**
[2] Total Liabilities	= ₹ 50,00,000
Equity share Capital + Reserves + Debt	= ₹ 50,00,000
So, Reserves	=₹ 50,00,000 - ₹ 20,00,000 - ₹ 20,00,000
So, Reserves & Surplus	= ₹ 10,00,000
[3] Long term Debt / Equity Shareholders' Fund	= 30%*
Long term Debt / [20,00,000+10,00,000]	=30%
Long Term Debt	= ₹ 9,00,000
[4] So, Accounts Payable	= ₹ 20,00,000 – ₹ 9,00,000
Accounts Payable	= ₹ 11,00,000
[5] Gross Profit to sales	= 20%
Cost of Goods Sold	= 80% of Sales = ₹ 64,00,000
Sales	= 100 / 80 × 64,00,000 = 80,00,000

[6] Inventory Turnover = 360 / 55

COGS / Closing inventory = 360 / 55

64,00,000 / Closing inventory = 360 / 55

Closing inventory **= 9,77,778**

[7] Accounts Receivable period = 36 days

Accounts Receivable / Credit sales × 360 = 36

Accounts Receivable = 36 / 360 × credit sales

= 36 / 360 × 80,00,000

[assumed all sales are on credit]

Accounts Receivable **= ₹ 8,00,000**

[8] Quick Ratio = 0.9

Quick Assets / Current liabilities = 0.9

Cash + Debtors / 11,00,000 = 0.9

Cash + 8,00,000 = ₹ 9,90,000

Cash = ₹ 1,90,000

[9] Fixed Assets = Total Assets- Current Assets

= 50,00,000 – [9,77,778+8,00,000+1,90,000]

= 30,32,222

Balance Sheet of ABC Industries as on 31st March 2021

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

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

5.

[a] Calculation of Operating Expenses for the year ended 31st March, 2021

Particulars	[₹]
Net Profit [@ 6.5% of Sales]	4,87,500
Add: Income Tax [@ 50%]	4,87,500
Profit Before Tax [PBT]	9,75,000
Add: Debenture Interest	75,000

Profit before interest and tax [PBIT]		10,50,000
Sales		75,00,000
Less: Cost of goods sold	22,50,000	
PBIT	10,50,000	33,00,000
Operating Expenses		42,00,000

[b] Balance Sheet as on 31st March, 2021

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

Working Notes:

[i] Calculation of Share Capital and Reserves

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

Net worth x 25 / 100 = ₹ 4,87,500

∴ Net worth = 4,87,500 x 100 / 25 = ₹ 19,50,000

The ratio of share capital to reserves is 6:4

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

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

[ii] Calculation of Debentures

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

∴ Debentures = 75,000 x 100 / 15 = ₹ 5,00,000

[iii] Calculation of Current Assets

Current Ratio = 2.5

Payables = ₹ 2,50,000

Bank overdraft = ₹ 1,50,000

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

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

[iv] Calculation of Fixed Assets

Particulars	₹
Share capital	11,70,000
Reserves	7,80,000
Debentures	5,00,000

Payables	2,50,000
Bank Overdraft	1,50,000
Total Liabilities	28,50,000
Less: Current Assets	10,00,000
Fixed Assets	18,50,000

[v] Calculation of Composition of Current Assets

Inventory Turnover = 12

Cost of goods sold / Clo sing stock = 12

Closing stock = ₹ 22,50,000 / 12 = Closing stock = ₹ 1,87,500

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

6.

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

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

Working Notes

1. Total Debt = 0.75 x Equity Share Capital = 0.75 x ₹ 2,00,000 = ₹ 1,50,000

Further, Current Debt to Total Debt = 0.40.

So, Current Debt = 0.40 x ₹ 1,50,000 = ₹ 60,000

Long term Debt = ₹ 1,50,000 - ₹ 60,000 = ₹ 90,000

2. Fixed Assets = 0.60 x Equity Share Capital = 0.60 x ₹ 2,00,000 = ₹ 1,20,000

3. Total Assets to Turnover = 2 times; Inventory Turnover = 8 times

Hence, Inventory /Total Assets = 2/8 =1/4

Further, Total Assets = ₹ 2,00,000 + ₹ 1,50,000 = ₹ 3,50,000

Therefore, Inventory = ₹ 3,50,000/4 = ₹ 87,500

Cash in Hand = Total Assets – Fixed Assets – Inventory

= ₹ 3,50,000 - ₹ 1,20,000 - ₹ 87,500 = ₹ 1,42,500

[b] Market price per share by-

[1] Gordon's Model:

Present market price per share $[P_o]^* = \frac{D_o(1+g)}{K_e - g}$

Present market price per share $[P_o] = \frac{D_1}{K_e - g}$

Where,

Po = Present market price per share.

g = Growth rate [br] = 0.75 X 0.22 = 0.165

b = Retention ratio [i.e., % of earnings retained]

r = Internal rate of return [IRR]

D0 = E x [1 – b] = 3 X [1 – 0.75] = 0.75

E = Earnings per share

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

*Alternatively, Po can be calculated as E[1 - b] / k - br= ₹ 50.

[2] Walter's Model:

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

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

Workings:

1. Calculation of Earnings per share

Particulars	Amount [₹]
Net Profit for the year	30,00,000
Less: Preference dividend [12% of ₹ 1,00,00,000]	[12,00,000]
Earnings for equity shareholders	18,00,000
No. of equity shares [₹ 60,00,000/₹ 10]	6,00,000
Therefore, Earnings per share [Earning for equity shareholders / No. of equity shares]	₹ 18,00,000/6,00,000 = ₹ 3.00

2. Calculation of Dividend per share

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

7.

Computation of net profit:

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

[i] Net profit margin [After tax] = Profit after taxes / Sales

= ₹ 1,01,500 / ₹ 8,25,000 = 0.12303 or 12.303%

Net profit margin [Before tax] = Profit before taxes / Sales

= ₹ 1,45,000 / ₹ 8,25,000 = 0.17576 or 17.576%

[ii] Return on assets = EBIT [1 -T] / Total Assets

= ₹ 1,85,000 [1 - 0.3] / ₹ 10,00,000 = 0.1295 or 12.95%

[iii] Asset turnover = Sales/Assets = ₹ 8,25,000 ₹ 10,00,000 = 0.825 times

[iv] Return on owner's equity = Profit after taxes/Owners equity

=₹ 1,01,50050% × ₹ 10,00,000 = 0.203 or 20.3%

8.

[i] Calculation of Return on capital employed [ROCE]

Capital employed = Equity Shareholders' funds + Debenture + Preference shares

= ₹ [10,00,000 + 8,00,000 + 6,00,000 + 2,00,000]

= ₹ 26,00,000

Return on capital employed [ROCE-[Pre-tax]] = PBIT / Capital Employed x 100

= ₹ 4,00,000 / ₹ 26,00,000 x 100 = 15.38% [approx.]

Return on capital employed [ROCE-[Post-tax]]= Profit after Tax / Capital Employed x 100

= ₹ 2,40,000 / ₹ 26,00,000 x 100 = 9.23% [approx.]

[ii] Calculation of Earnings per share

Earnings per share = Earnings available to equity shareholders / No of equity shares

= Profit after tax-preference Dividend / No of equity shares

= ₹ [2,40,000 - 20,000] / ₹ 1,00,000 = ₹ 2.20

[iii] Calculation of PE ratio

PE = Market Price per Share [MPS] / Earning per Shares [EPS]

= ₹ 14 / ₹ 2.20 = 6.364 [approx.]

9.

Workings

Non-Current Assets / Current Assets2 = ½

Or 50,00,000 / Current Assets = 1/2

So, Current Assets = ₹ 1,00,00,000

Now further,

Non-Current Assets / Sales =1 / 4

Or 50,00,000 / Sales = 1 / 4

So, Sales = ₹ 2,00,00,000

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

[i] Cost of Goods Sold [COGS]:

Cost of Goods Sold = Sales- Gross Profit

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

= ₹ 1,60,00,000

[ii] Net Profit = 10% of Sales = 10% of ₹ 2,00,00,000

= ₹ 20,00,000

[iii] Inventory:

Inventory Holding Period = 12 Months / Inventory Turnover Ratio

Inventory Turnover Ratio = 12/ 3 = 4

4 = COGS / Average Inventory

4 = 1,60,00,000 / Average Inventory

Average or Closing Inventory =₹ 40,00,000

[iv] Receivables :

Receivable Collection Period = 12 Months / Receivables Turnover Ratio

Or Receivables Turnover Ratio = 12/ 3 = 4 = Credit Sales / Average Accounts Receivable

Or 4 = 2,00,00,000 / Average Accounts Receivable

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

[v] Cash:

Cash* = Current Assets* – Inventory- Receivables

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

= ₹ 10,00,000

[it is assumed that no other current assets are included in the Current Asset]

10.

Ratios	Comment
Liquidity	Current ratio has improved from last year and matching the industry average. Quick ratio also improved than last year and above the industry average. The reduced inventory levels [evidenced by higher inventory turnover ratio] have led to better quick ratio in FY 2022 compared to FY 2021. Further the decrease in current liabilities is greater than the collective decrease in inventory and debtors as the current ratio have increase from FY2021 to FY 2022.
Operating Profits	Operating Income-ROI reduced from last year, but Operating Profit Margin has been maintained. This may happen due to decrease in operating cost. However, both the ratios are still higher than the industry average.
Financing	The company has reduced its debt capital by 1% and saved earnings for equity shareholders. It also signifies that dependency on debt compared to other industry players [60%] is low.
Return to the shareholders	Prabhu's ROE is 26 per cent in 2021 and 28 per cent in 2022 compared to an industry average of 18 per cent. The ROE is stable and improved over the last year.

11.

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

Working Notes:

[i] Sales ₹ 21,00,000

Less: Gross Profit [20%] ₹ 4,20,000

Cost of Goods Sold [COGS] ₹ 16,80,000

[ii] Receivables Turnover Velocity = Average Receivables / Credit Sales x12

2 = Average Receivables = ₹ 21,00,000 75% x 2 / 12

Average Receivables = ₹ 21,00,000 x 75% x 2 / 12

Average Receivables = ₹ 2,62,500

Closing Receivables = ₹ 2,62,500

[iii] Stock Turnover Velocity = Average Stock / COGS x 12

Or 1.5 = Average Stock / ₹ 16,80,000 x 12

Or Average Stock = ₹ 16,80,000 x 1.5 / 12

Or Average Stock = ₹ 2,10,000

Opening Stock + Closing Stock / 2 = ₹ 2 10 000

Opening Stock + Closing Stock = ₹ 4,20,000……..[1]

Also, Closing Stock-Opening Stock = ₹ 40,000……..[2]

Solving [1] and [2], we get closing stock = ₹ 2,30,000

[iv] Current Ratio = Current Assets / Current Liabilities

= Stock + Receivables + Cash/ Bank Overdraft + Creditors

Or 2 = 2,30,000 + 2,62,500 + Cash / 60,000 + Creditors

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

Or 2 Payables – Cash.= ₹ 3,72,500

Or Cash = 2 Payables – ₹ 3,72,500……..[3]

Acid Test Ratio = Current Assests - Stock / Current Liabilities

= Debtor + Cash / Current Liabilities

Or = 3 / 2 = ₹ 2,62,500 + Cash / 60,000 + Creditors

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

Or 3 Payables – 2 Cash = ₹ 3,45,000 …… [4]

Substitute [3] in [4]

Or 3 Payables – 2[2 Payables – ₹ 3,72,500] = ₹ 3,45,000

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

[Payables] = ₹ 3,45,000 - ₹ 7,45,000

Payables = ₹ 4,00,000

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

Cash = ₹ 4,27,500

[v] Long term Debt = 45% of Net Worth

Or ₹ 6,75,000 = 45% of Net Worth

Net Worth = ₹ 15,00,000

[vi] Equity Share Capital [ESC] + Reserves = ₹ 15,00,000

Or ESC + 0.2ESC = ₹ 15,00,000

Or 1.2 ESC = ₹ 15,00,000

Equity Share Capital [ESC] = ₹ 12,50,000

[vii] Reserves = 0.2 x ₹ 12,50,000

Reserves = ₹ 2,50,000

[viii] Total of Liabilities=Total of Assets

Or ₹ 12,50,000 + ₹ 2,50,000 + ₹ 6,75,000 +₹ 60,000 + ₹ 4,00,000 + Fixes

Assets [FA] [WDV] + ₹ 2,30,000 + ₹ 2,62,000 +₹ 4,27,500

Or ₹ 26,35,000 = ₹ 9,20,000 + FA[WDV]

FA [WDV] =₹ 17,15,000

Now FA[Cost] – Depreciation = FA[WDV]

Or FA [Cost] – FA[Cost]/6 = ₹ 17,15,000

Or 5 FA [Cost]/6 = ₹ 17,15,000

Or FA [Cost] = ₹ 17,15,000x 6/5

So, FA [Cost] = ₹ 20,58,000

Depreciation = ₹ 20,58,000/6 = ₹ 3,43,000

12.

Working Notes:

[i] Calculation of Sales

Fixed Assets / Sales = 1 / 3

∴ 1,30,00,000 / Sales = 1/ 3 ⇒ Sales = ₹ 3,90,00,000

[ii] Calculation of Current Assets

Fixed Assets / Current Assets = 13 / 11

∴ 1,30,00,000 / Current Assets = 13/ 11 ⇒ Current Assets = ₹ 1,10,00,000

[iii] Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	3,90,00,000
Less: Gross Profit [15 % of Sales]	58,50,000
Cost of Goods sold	3,31,50,000

Raw Material Consumption [20% of Cost of Goods Sold] ₹ 66,30,000

Direct Wages [10% of Cost of Goods Sold] ₹ 33,15,000

[iv] Calculation of Stock of Raw Materials [= 3 months usage]

= 66,30,000 x 3 / 12 = ₹ 16,57,500

[v] Calculation of Stock of Finished Goods [= 6% of Cost of Goods Sold]

= 3,31,50,000 x 6 / 100 = ₹ 19,89,000

[vi] Calculation of Current Liabilities

Current Assets / Current Liabilities = 2

1,10,00,000 / Current Liabilities =2 ⇒ Current Liabilities = ₹ 55,00,000

[vii] Calculation of Debtors

Average collection period = Debtors / Credit Sales × 12 months

Debtors / 3,90,00,000 × 12 = 2 ⇒Debtors = ₹ 65,00,000

[viii] Calculation of Long-term Loan

Long term Loan / Current Liabilities = 2/1

Long term loan / 55,00,000 = 2 / 1 ⇒Long term loan = ₹ 1,10,00,000

[ix] Calculation of Cash Balance

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

[x] Calculation of Net worth

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

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

Capital / Reserves and Surplus = 1 / 4 ⇒Share Capital = ₹ 75,00,000 × 1/5 = ₹ 15,00,000

Reserves and Surplus = ₹ 75,00,000 × 4 / 5 = ₹ 60,00,000

Profit and Loss Statement of ASD Ltd.

for the year ended 31st March, 2022

Particulars	[₹]	Particulars	[₹]
To Direct Materials consumed	66,30,000	By Sales	3,90,00,000
To Direct Wages	33,15,000		
To Works [Overhead] [Bal. fig.]	2,32,05,000		
To Gross Profit c/d [15% of Sales]	58,50,000		
	3,90,00,000		3,90,00,000
To Selling and Distribution Expenses [Bal. fig.]	27,30,000	By Gross Profit b/d	58,50,000
To Net Profit [8% of Sales]	31,20,000		
	58,50,000		58,50,000

Balance Sheet of ASD Ltd.

as at 31st March, 2022

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

13.

[i] Determination of Sales and Cost of goods sold:

Gross Profit Ratio = Gross Profit / sales × 100

Or, 25 / 100 = ₹ 12,00,000/ Sales

Or, Sales = 12,00,00,000 / 25 = ₹ 48,00,000

Cost of Goods Sold = Sales – Gross Profit

= ₹ 48,00,000 - ₹ 12,00,000 = ₹ 36,00,000

[ii] Determination of Sundry Debtors:

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

So, Debtors' turnover ratio = 12months / 3months = 4

Debtors' turnover ratio = Credit Sales / Average Accounts Receivable

= ₹ 48,00,000 / Bills Receivable + Sundry Debtors = 4

Or, Sundry Debtors + Bills receivable = ₹ 12,00,000

Sundry Debtors = ₹ 12,00,000 – ₹ 75,000 = ₹ 11,25,000

[iii] Determination of Closing Stock

Stock Turnover Ratio = Cost of Goods Sold / Average Stock

= ₹ 36,00,000 / Average Stock =1.5

So, Average Stock = ₹ 24,00,000

Now Average Stock = Opening Stock + Closing Stock / 2

Or

Opening Stock + [Opening Stock + ₹ 30,000] / 2

= ₹ 24,00,000

Or 2 Opening Stock + ₹ 30,000= ₹ 48,00,000

Or 2 Opening Stock = ₹ 47,70,000

Or, Opening Stock = ₹ 23,85,000

So, Closing Stock = ₹ 23,85,000 + ₹ 30,000 = ₹ 24,15,000

[iv] Determination of Sundry Creditors:

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

So, Creditors' turnover ratio = 12 months / 2 months = 6

Creditors turnover ratio = Credit Purchases */ Average Accounts Payables

= ₹ 36,30,000 / Sundry Creditors + Bills Payables = 6

So, Sundry Creditors + Bills Payable = ₹ 6,05,000

Or, Sundry Creditors + ₹ 30,000 = ₹ 6,05,000

Or, Sundry Creditors = ₹ 5,75,000

[v] Determination of Fixed Assets

Fixed Assets Turnover Ratio = Cost of Goods Sold / Fixed Assets = 4

Or, ₹ 36,00,000 / Fixed Assets = 4

Or, Fixed Asset = ₹ 9,00,000

Workings:

*Calculation of Credit purchases:

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

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

Purchases [credit] = ₹ 36,30,000

Calculation of credit purchase also can be done as below:

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

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

14.

[i] Return on Capital Employed [ROCE]

ROCE [Pre-tax] = Profit before interest and taxes[PBIT] / Capital Employed × 100

= 8,00,000 / 52,00,000 × 100

= 15.38% [approx.]

ROCE [Post-tax] = PBIT[1 - t] / Capital Employed × 100

= 8,00,000 [1 0.25] / 52,00,000 × 100

= 11.54% [approx.]

[ii] Earnings Per share [EPS]

= Profit available to equity shareholders / Number of equity shares outstanding

= ₹ 4, 47,500 / 1,00,000 = ₹ 4.475

[iii] P/E Ratio

= Market Price per Share [MPS] / Earning per Share [EPS]

= ₹ 28 / ₹ 4.475

= 6.26 times [approx.]

Workings:

[a] Income Statement

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

[b] Calculation of Capital Employed

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

= [₹ 20,00,000 + ₹ 16,00,000] + ₹ 4,00,000 + ₹ 12,00,000 = ₹ 52,00,000

15.

[i] Return on total assets

Return on total assets = EBIT [1 - T] / Total assets [FA + CA]

= ₹ 2.30 crores [1- 0.3] / ₹ 5.20 crores + ₹ 7.80 crores

=₹ 1.61crores / ₹ 13 crores = 0.1238 or 12.38%

[ii] Return on owner's equity

[Amount in ₹]

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

[iii] Net Working capital

[₹ in crores]

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

[iv] Current ratio

[₹ in crores]

	Financing policy		
	Conservative	**Moderate**	**Aggressive**
Current Ratio = Current Assets / Current Liabilities	= 7.80 / 5.76 = 1.35	= 7.80 / 6.68 = 1.17	= 7.80 / 7.68 = 1.02

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

16.

Working notes:

[i] Current Assets and Current Liabilities computation:

Current assets / Current liabilities = 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 = Liquid Assets / Current liabilities

Or 1.5 = Current assets - Inventories / Rs.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	=	Fixed assets / Proprietary fund = 0.75
∴ Fixed Assets	=	0.75 Proprietary fund [PF][FA+NWC = PF]
or NWC	=	PF- FA [[i.e. .75 PF]]
and Net Working Capital [NWC]	=	0.25 Proprietary fund
Or ₹ 4,80,000/0.25	=	Proprietary fund
Or Proprietary fund	=	₹ 19,20,000
and Fixed Assets	=	0.75 proprietary fund
	=	0.75 x ₹ 19,20,000 = ₹ 14,40,000
Capital	=	Proprietary fund − Reserves & Surplus
	=	₹ 19,20,000 − ₹ 3,20,000 = ₹ 16,00,000
Sundry Creditors	=	[Current liabilities − Bank overdraft]
	=	[₹ 3,20,000 − ₹ 80,000] = ₹ 2,40,000

Balance Sheet as at 31st March, 2020

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

17.

Ratios for the year 2019-2020

[a] Inventory turnover ratio

= COSG / Average Inventory = $\frac{Rs.21,100}{\frac{Rs.(2,500+2,000)}{2}} = 9.4$

[b] Financial leverage

= EBIT / EBT = ₹ 950 / ₹ 650 = 1.46

[c] ROCE

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

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

[d] ROE

= Profits after tax / Average shareholders' funds = ₹ 455 /₹ 2500 x 100 = 18.2%

[e] Average Collection Period

Average Sales per day = = ₹ 23800 / 365 = ₹ 65.20 lakhs

Average collection period= Average Receivable / Average sales per day

$$= \frac{\frac{Rs.(1,400+1,100)}{2}}{Rs.65.2} = \frac{Rs.1,250}{Rs.65.2} = 19.17 days$$

18.

[i] Gross profit ratio = Gross profit / Sales x 100 = ₹ 42,18,000 / ₹ 1,96,56,000 x 100 = 21.46%

[ii] Net profit ratio = Net profit / sales x 100 = ₹ 14,08,600 / ₹ 1,96,56,000 x 100 = 7.17%

[iii] Operating ratio = Operating cost / Sales x 100

Operating cost = Cost of goods sold + Operating expenses

Cost of goods sold = Sales – Gross profit

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

Operating expenses = Administrative expenses + Selling & distribution expenses

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

Therefore, Operating ratio = 1,54,38,000 + 25,96,000 / 1,96,56,000 x 100

= 1,80,34,000 / 1,96,56,000 x 100 = 91.75%

[iv] Operating profit ratio = 100 – Operating cost ratio

= 100 – 91.75% = 8.25%

[v] Inventory turnover ratio = Cost of goods sold / Average stock

= 1,54,38,000 / [14,28,000 + 12,46,000]/2

= 1,54,38,000 / 13,37,000 = 11.55 times

[vi] Current ratio = Current assets / Current liabilities

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

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

Current liabilities = Sundry Payables + Other liabilities

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

Current ratio = 32,00,000 / 10,00,000 = 3.2 times

[vii] Quick Ratio = Current assets – Inventories / Current liabilities

= 32,00,000- 14,28,000 / 10,00,000 =1.77 times

[viii] Interest coverage ratio = EBIDT / Interest = Net profit + Interest / Interest

= 14,08,600 + 2,60,000 / 2,60,000 = 6.42 times

[ix] Return on capital employed [ROCE] = EBIT / Capital employed x 100

Capital employed = Capital + Retained earnings + General reserve + Term loan

= 20,00,000 + 42,00,000 + 12,00,000 + 26,00,000

= 1,00,00,000

Therefore, ROCE = 16,68,600 / 1,00,00,000 x 100 = 16.69%

[x] Debt to assets ratio = Debts / Total assets x 100 = 26,00,000 / 1,10,00,000 x 100 =23.64%

19.

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

CHAPTER 7: WORKING CAPITAL MANAGEMENT

PART – A: ICAI PAST EXAM QUESTIONS

PROBLEM – 1 [MAY 23]

A company has current sale of ₹ 12 lakhs per year. The profit-volume ratio is 20% and post-tax cost of investment in receivables is 15%. The current credit terms are 1/10, net 50 days and average collection period is 40 days. 50% of customers in terms of sales revenue are availing cash discount and bad debt is 2% of sales.

In order to increase sales, the company want to liberalize its existing credit terms to 2/10, net 35 days. Due to which, expected sales will increase to ₹ 15 lakhs. Percentage of default in sales will remain same. Average collection period will decrease by 10 days. 80% of customers in terms of sales revenue are expected to avail cash discount under this proposed policy.

Tax rate is 30%.

ADVISE, should the company change its credit terms. [Assume 360 days in a year.]

PROBLEM – 2 [NOV 22]

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

Time interval between two conversions.

PROBLEM – 3 [MAY 22]

A company requires 36,000 units of a product per year at cost of ₹ 100 per unit. Ordering cost per order is ₹ 250 and the carrying cost is 4.5% per year of the inventory cost. Normal lead time is 25 days and safety stock is NIL. Assume 360 working days in a year.

(i) Calculate the Reorder Inventory Level.

(ii) Calculate the Economic Order Quantity [EOQ].

If the supplier offers 1% quantity discount for purchase in lots of 9,000 units or more, should the company accept the proposal?

PROBLEM – 4 [NOV 21]

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

	January [₹ '000]	February [₹ '000]	March [₹ '000]
Total sales	600	600	800

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

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

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

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

	November [₹ '000]	December [₹ '000]
Total sales	640	880

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

PROBLEM – 5 [JULY 21]

Current annual sale of SKD Ltd. is ₹ 360 lakhs. It's directors are of the opinion that company's current expenditure on receivables management is too high and with a view to reduce the expenditure they are considering following two new alternate credit policies:

	Policy X	Policy Y
Average collection period	1.5 months	1 month
% of default	2%	1%
Annual collection expenditure	₹ 12 lakh	₹ 20lakh

Selling price per unit of product is ₹ 150.

Total cost per unit is ₹ 120.

Current credit terms are 2 months and percentage of default is 3%.

Current annual collection expenditure is ₹ 8 lakh. Required rate of return on investment of SKD Ltd. is 20%. Determine which credit policy SKD Ltd. should follow.

PROBLEM – 6 [JAN 21]

The following information is provided by MNP Ltd. for the year ending 31st March, 2020:

Raw Material Storage period	45 days
Work-in-Progress conversion period	20 days
Finished Goods storage period	25 days
Debt Collection period	30 days
Creditors payment period	60 days
Annual Operating Cost	₹25,00,000
[Including Depreciation of ₹ 2,50,000]	

Assume 360 days in a year.

You are required to calculate:

(i) Operating Cycle period

(ii) Number of Operating Cycle in a year.

(iii) Amount of working capital required for the company on a cost basis.

(iv) The company is a market leader in its product and it has no competitor in the market. Based on a market survey it is planning to discontinue sales on credit and deliver products based on pre-payments in order to reduce its working capital requirement substantially. You are required to compute the reduction in working capital requirement in such a scenario.

PROBLEM – 7 [NOV 20]

PK Ltd., a manufacturing company, provides the following information:

	[₹]
Sales	1,08,00,000
Raw Material Consumed	27,00,000
Labour Paid	21,60,000
Manufacturing Overhead [Including Depreciation for the year ₹ 3,60,000]	32,40,000
Administrative & Selling Overhead	10,80,000

Additional Information:

(a) Receivables are allowed 3 months' credit.

(b) Raw Material Supplier extends 3 months' credit.

(c) Lag in payment of Labour is 1 month.

(d) Manufacturing Overhead are paid one month in arrear.

(e) Administrative & Selling Overhead is paid 1 month advance.

(f) Inventory holding period of Raw Material & Finished Goods are of 3 months.

(g) Work-in-Progress is Nil.

(h) PK Ltd. sells goods at Cost plus 33⅓%.

(i) Cash Balance ₹ 3,00,000.

(j) Safety Margin 10%.

You are required to compute the Working Capital Requirements of PK Ltd. on Cash Cost basis.

PROBLEM – 8 [NOV 19]

Slide Ltd. is preparing a cash flow forecast for the three months period from January to the end of March. The following sales volumes have been forecasted:

Months	December	January	February	March	April
Sales [units]	1,800	1,875	1,950	2,100	2,250

Selling price per unit is ₹ 600. Sales are all on one month credit. Production of goods for sale takes place one month before sales. Each unit produced requires two units of raw materials costing ₹ 150 per unit. No raw material inventory is held. Raw materials purchases are on one month credit. Variable overheads and wages equal to ₹ 100 per unit are incurred during production and paid in the month of production. The opening cash balance on 1st January is expected to be ₹ 35,000. A long term loan of ₹ 2,00,000 is expected to be received in the month of March. A machine costing ₹ 3,00,000 will be purchased in March.

(a) Prepare a cash budget for the months of January, February and March and calculate the cash balance at the end of each month in the three months period.

(b) Calculate the forecast current ratio at the end of the three months period.

PROBLEM – 9 [NOV 18]

MN Ltd. has a current turnover of ₹ 30,00,000 p.a. Cost of Sale is 80% of turnover and Bad Debts are 2% of turnover, Cost of Sales includes 70% variable cost and 30% Fixed Cost, while company's required rate of return is 15%. MN Ltd. currently allows 15 days credit to its customer, but it is considering increase this to 45 days credit in order to increase turnover. It has been estimated that this change in policy will increase turnover by 20%, while Bad Debts will increase by 1%. It is not expected that the policy change will result in an increase in fixed cost and creditors and stock will be unchanged.

Should MN Ltd. introduce the proposed policy? [Assume 360 days year]

PART – B: [REVISION TEST PAPERS]

PROBLEM – 10 [RTP - NOV 23]

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

Pattern of Payment Schedule	
At the end of 30 days	20% of the bill
At the end of 60 days	30% of the bill.

At the end of 90 days	30% of the bill
At the end of 100 days	18% of the bill
Non-recovery	2% of the bill

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

PROBLEM – 11 [RTP - NOV 23]

Consider the following figures and ratios:

i] Sales for the year [all credit]	₹ 1,05,00,000
ii] Gross Profit ratio	35 percent
iii] Fixed assets turnover [based on cost of goods sold]	1.5
iv] Stock turnover [based on cost of goods sold]	6
v] Liquid ratio	1.5:1
vi] Current ratio	2.5:1
vii] Receivables [Debtors] collection period	1 month
viii] Reserves and surplus to Share capital	1:1.5
ix] Capital gearing ratio	0.7875
x] Fixed assets to net worth	1.3 : 1

You are required to PREPARE:

(a) Balance Sheet as on 31/3/2022 based on above details.

(b) The statement showing working capital requirement if the company wants to make a provision for contingencies @ 14 percent of net working capital.

PROBLEM – 12 [RTP - MAY 23]

River limited currently uses the credit terms of 1.5/15 net 45 days and average collection period was 30 days. The company presently having sales of ₹ 50,00,000 and 30% customers availing the discount. The chances of default are currently 5%. Variable cost constitutes 65% and total cost constitute 85% of sales. The company is planning liberalization of credit terms to 2/20 net 50 days. It is expected that sales are likely to increase by ₹ 5,00,000, the default chances are 10% and average collection period will decline to 25 days. There won't be any change in the fixed cost and 50% customers are expected to avail the discount. Tax rate is 35%.

EVALUATE this policy in comparison with the current policy and recommend whether the new policy should be implemented. Assume cost of capital to be 10% [post tax] and 360 days in a year.

PROBLEM – 13 [RTP - MAY 23]

Kalyan limited has provided you the following information for the year 2021 22: By working at 60% of its capacity the company was able to generate sales of ₹ 72,00,000. Direct labour cost per unit amounted to ₹ 20 per unit. Direct material cost per unit was 40% of the selling price per unit. Selling price was 3 times the direct labour cost per unit. Profit margin was 25% on the total cost. For the year 2022-23, the company makes the following estimates:

Production and sales will increase to 90% of its capacity. Raw material per unit price will remain unchanged. Direct expense per unit will increase by 50%. Direct labour per unit will increase by 10%. Despite the fluctuations in the cost structure, the company wants to maintain the same profit margin on sales.

Raw materials will be in stock for one month whereas finished goods will remain in stock for two months. Production cycle is for 2 months. Credit period allowed by suppliers is 2 months. Sales are made to three zones:

Zone	Percentage of sale	Mode of Credit
A	50%	Credit period of 2 months
B	30%	Credit period of 3 months
C	20%	Cash Sales

There are no cash purchases and cash balance will be ₹ 1,11,000 . The company plans to apply for a working capital financing from bank for the year 2022- 23. ESTIMATE Net Working Capital of the Company receivables to be taken on sales and also COMPUTE the maximum permissible bank finance for the company using 3 criteria of Tandon Committee Norms. [Assume stock of finished goods to be a core current asset]

PROBLEM – 14 [RTP - NOV 22]

A company was incorporated w.e.f. 1st April, 2021. Its authorised capital was ₹ 1,00,00,000 divided into 10 lakh equity shares of ₹ 10 each. It intends to raise capital by issuing equity shares of ₹ 50,00,000 [fully paid] on 1st April. Besides this, a loan of ₹ 6,50,000 @ 12% per annum will be obtained from a financial institution on 1st April and further borrowings will be made at same rate of interest on the first day of the month in which borrowing is required. All borrowings will be repaid along with interest on the expiry of one year. The company will make payment for the following assets in April.

Particulars	[₹]
Plant and Machinery	10,00,000
Land and Building	20,00,000
Furniture	5,00,000
Motor Vehicles	5,00,000
Stock of Raw Materials	5,00,000

The following further details are available:

(1) Projected Sales [April-September]:

	[₹]
April	15,00,000
May	17,50,000
June	17,50,000
July	20,00,000
August	20,00,000
September	22,50,000

(2) Gross profit margin will be 25% on sales.

(3) The company will make credit sales only and these will be collected in the second month following sales.

(4) Creditors will be paid in the first month following credit purchases. There will be credit purchases only.

(5) The company will keep minimum stock of raw materials of ₹ 5,00,000.

(6) Depreciation will be charged @ 10% per annum on cost on all fixed assets.

(7) Payment of miscellaneous expenses of ₹ 50,000 will be made in April.

(8) Wages and salaries will be ₹ 1,00,000 each month and will be paid on the first day of the next month.

(9) Administrative expenses of ₹ 50,000 per month will be paid in the month of their incurrence.

(10) No minimum cash balance is required.

You are required to PREPARE the monthly cash budget [April-September], the projected Income Statement for the 6 months period and the projected Balance Sheet as on 30th September, 2021.

PROBLEM – 15 [RTP - NOV 22]

Trading and Profit and Loss Account of Beat Ltd. for the year ended 31st March, 2022 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.

PROBLEM – 16 [RTP - MAY 22]

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

Profit and Loss Account

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

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

As a result, other expenses will increase by ₹ 20,00,000 besides other charges. Only raw materials are in stock. Assume sales and purchases are in cash terms and the closing stock is expected to go up by the same amount as between year 1 and 2. You may assume that no dividend is being paid. The Company can use 75% of the cash generated to service a loan. COMPUTE how much cash from operations will be available in year 3 for the purpose? Ignore income tax.

PROBLEM – 17 [RTP - MAY 22]

PQR Ltd., a company newly commencing business in the year 2021-22, provides the following projected Profit and Loss Account:

	[₹]	[₹]
Sales		5,04,000
Cost of goods sold		3,67,200

Gross Profit		1,36,800
Administrative Expenses	33,600	
Selling Expenses	31,200	64,800
Profit before tax		72,000
Provision for taxation		24,000
Profit after tax		48,000
The cost of goods sold has been arrived at as under:		
Materials used	2,01,600	
Wages and manufacturing Expenses	1,50,000	
Depreciation	56,400	
	4,08,000	
Less: Stock of Finished goods [10% of goods produced not yet sold]	40,800	
	3,67,200	

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 th e Income tax will be paid in advance in quarterly instalments. The company wishes to keep₹ 19,200 in cash. 10% must be added to the estimated figure for unforeseen contingencies. PREPARE an estimate of working capital.

PROBLEM – 18 [RTP - NOV 21]

The Alliance Ltd., a Petrochemical sector company had just invested huge amount in its new expansion project. Due to huge capital investment, the company is in need of an additional ₹ 1,50,000 in working capital immediately. The Finance Manger has determined the following three feasible sources of working capital funds:

(i) Bank loan: The Company's bank will lend ₹ 2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would not be maintained by the company.

(ii) Trade credit: The company has been offered credit terms from its major supplier of 3/30, net 90 for purchasing raw materials worth ₹ 1,00,000 per month.

(iii) Factoring: A factoring firm will buy the company's receivables of ₹ 2,00,000 per month, which have a collection period of 60 days. The factor will advance up to 75 % of the face value of the receivables at 12% on an annual basis. The factor will also charge commission of 2% on all receivables purchased. It has been estimated that the factor's services will save the company a credit department expense and bad debt expense of ₹ 1,250 and ₹ 1,750 per month respectively.

On the basis of annual percentage cost, ADVISE which alternative should the company select? Assume

360 days year.

PROBLEM – 19 [RTP - NOV 21]

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.

PROBLEM – 20 [RTP - MAY21]

MT Ltd. has been operating its manufacturing facilities till 31.3.2021 on a single shift working with the following cost structure:

	Per unit [₹]
Cost of Materials	24
Wages [out of which 60% variable]	20
Overheads [out of which 20% variable]	20
	64
Profit	8
Selling Price	72

As at 31.3.2021 with the sales of ₹ 17,28,000, the company held:

	[₹]

Stock of raw materials [at cost]	1,44,000
Work-in-progress [valued at prime cost]	88,000
Finished goods [valued at total cost]	2,88,000
Sundry debtors	4,32,000

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same. The credit period allowed to customers will remain unaltered. Credit availed from suppliers will continue to remain at the present level i.e. 2 months. Lag in payment of wages and overheads will continue to remain at one month.

You are required to CALCULATE the additional working capital requirements, if the policy to increase output is implemented, to assess the impact of double shift for long term as a matter of production policy.

PROBLEM – 21 [RTP - MAY 21]

While applying for financing of working capital requirements to a commercial bank, TN Industries Ltd. projected the following information for the next year:

Cost Element	Per unit [₹]	Per unit [₹]
Raw materials		
X	30	
Y	7	
Z	6	43
Direct Labour		25
Manufacturing and administration overheads [excluding depreciation]		20
Depreciation		10
Selling overheads		15
		113

Additional Information:

(a) Raw Materials are purchased from different suppliers leading to different credit period allowed as follows:

X – 2 months; Y– 1 months; Z – ½ month

(b) Production cycle is of ½ month. Production process requires full unit of X and Y in the beginning of the production. Z is required only to the extent of half unit in the beginning and the remaining half unit is needed at a uniform rate during the production process.

(c) X is required to be stored for 2 months and other materials for 1 month.

(d) Finished goods are held for 1 month.

(e) 25% of the total sales is on cash basis and remaining on credit

PROBLEM – 22 [RTP - NOV 20]

A company wants to follow a more prudent policy to improve its sales for the region which is ₹ 9 lakhs per annum at present, having an average collection period of 45 days. After certain researches, the management consultant of the company reveals the following information:

Credit Policy	Increase in collection period	Increase in sales	Present default anticipated
W	15 days	₹ 60,000	1.5%
X	30 days	₹ 90,000	2%
Y	45 days	₹ 1,50,000	3%
Z	70 days	₹ 2,10,000	4%

The selling price per unit is ₹ 3. Average cost per unit is ₹ 2.25 and variable costs per unit are ₹ 2. The current bad debt loss is 1%. Required return on additional investment is 20%. [Assume 360 days year] ANALYSE which of the above policies would you recommend for adoption?

PROBLEM –23 [RTP - NOV 20]

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.

PROBLEM – 24 [RTP - MAY 20]

TM Limited, a manufacturer of colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to other sales are as follows:

Quantity sold [No. of TV Sets]

Credit Period [Days]	A	B	C
0	10,000	10,000	-
30	10,000	15,000	-
60	10,000	20,000	10,000
90	10,000	25,000	15,000

The selling price per TV set is ₹15,000. The expected contribution is 50% of the selling price. The cost of carrying receivable averages 20% per annum.

You are required to COMPUTE the credit period to be allowed to each customer. [Assume 360 days in a year for calculation purposes].

PROBLEM – 25 [RTP - MAY 20]

Day Ltd., a newly formed company has applied to the Private Bank for the first time for financing it's Working Capital Requirements. The following information is available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31,200 plus unit of work in progress 12,000
Raw Material Cost	₹ 40 per unit
Direct Wages Cost	₹ 15 per unit
Overhead	₹ 40 per unit [inclusive of Depreciation ₹10 per unit]
Selling Price	₹ 130 per unit
Raw Material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24,000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages [Lag in payment]	15 days
Expected cash balance	Rs.2,00,000

Assume that production is carried on evenly throughout the year [360 days] and wages and overheads accrue similarly. All sales are on the credit basis. You are required to CALCULATE the Net Working Capital Requirement on Cash Cost Basis.

PROBLEM – 26 [RTP - NOV 19]

Following are cost information of KG Ltd., which has commenced a new project for an annual production of 24,000 units which is the full capacity:

	Costs per unit [₹]
Materials	80.00

Direct labour and variable expenses	40.00
Fixed manufacturing expenses	12.00
Depreciation	20.00
Fixed administration expenses	8.00
	160.00

The selling price per unit is expected to be ₹192 and the selling expenses ₹10 per unit, 80% of which is variable.

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

Year	Production [No. of units]	Sales [No. of units]
1	12,000	10,000
2	18,000	17,000

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

Stock of materials 2 months' average consumption

Work-in-process Nil

Debtors 2 month's average sales.

Cash balance ₹ 1,00,000

Creditors for supply of materials 1 month's average purchase during the year.

Creditors for expenses 1 month's average of all expenses during the year.

PREPARE, for the two years:

(i) A projected statement of Profit/Loss [Ignoring taxation]; and

(ii) A projected statement of working capital requirements

PROBLEM – 27 [RTP - NOV 19]

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

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

The customer wants to enter into a firm commitment for purchase of goods of ₹30 lakhs in 2019, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is ₹300 on which a profit of ₹10 per unit is expected to be made. It is anticipated that taking up of this contract would mean an extra recurring expenditure of ₹10,000 per

annum. If the opportunity cost is 18% per annum, would you as the finance manager of the company. RECOMMEND the grant of credit to the customer? Assume 1 year = 360 days.

PROBLEM – 28 [RTP - MAY 19]

A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are ₹ 2.60 crores an ₹ 2.34 crores respectively. Estimated Sales and EBIT depend on current asset investment, particularly inventories and book-debts. The Financial Controller of the company is examining the following alternative Working Capital Policies:

[₹ in crore]

Working Capital Policy	Investment in Current Assets	Estimated Sales	EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use ₹ 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate-Average	12%	16%

You are required to CALCULATE the following:

(i) Working Capital Investment for each policy:

- **(a)** Net Working Capital position
- **(b)** Rate of Return
- **(c)** Current ratio

(ii) Financing for each policy:

- **(d)** Net Working Capital position.
- **(e)** Rate of Return on Shareholders' equity.
- **(f)** Current ratio.

PROBLEM – 29 [RTP - MAY 19]

A proforma cost sheet of a company provides the following particulars:

	Amount per unit [₹]
Raw materials cost	100.00
Direct labour cost	37.50
Overheads cost	75.00
Total cost	212.50
Profit	37.50
Selling Price	250.00

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

The credit allowed by suppliers is three weeks and company allows four weeks credit to its debtors.

The lag in payment of wages is one week and lag in payment of overhead expenses is two weeks.

The Company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at ₹37,500.

Required:

PREPARE a statement showing estimate of Working Capital needed to finance an activity level of 1,30,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 80% complete in all respects.

ANSWERS

1.

[i] Calculation of Cash Discount

Cash Discount = Total credit sales × % of customers who take up discount × Rate

Present Policy = 12,00,000×50×0.01 / 100 = ₹ 6,000

Proposed Policy = 15,00,000 × 0.80 × 0.02 = ₹ 24,000

[ii] Opportunity Cost of Investment in Receivables

Present Policy: Opportunity Cost = Total Cost × Collection period / 360 x Rate of Return / 100

= 9,60,000 × 40 15 / 360 × 15 / 100 = ₹ 16,000

Proposed Policy: = Total Cost × Collection period / 360 x Rate of Return / 100

= 12,00,000 × 30/360 x 15 / 100 = ₹ 15,000

Statement showing Evaluation of Credit Policies

Particulars	Present Policy	Proposed Policy
Credit Sales	12,00,000	15,00,000
Variable Cost @ 80%* of sales	9,60,000	12,00,000
Bad Debts @ 2%	24,000	30,000
Cash Discount	6,000	24,000
Profit before tax	**2,10,000**	**2,46,000**
Tax @ 30%	63,000	73,800
Profit after Tax	**1,47,000**	**1,72,200**
Opportunity Cost of Investment in Receivables	16,000	15,000
Net Profit	**1,31,000**	**1,57,200**

*Only relevant or variable costs are considered for calculating the opportunity costs on the funds blocked in receivables. Since 20% is profit-volume ratio, hence the relevant costs are taken to be 80% of the respective sales.

Advise: Proposed policy should be adopted since the net benefit is increased by [₹ 1,57,200 - ₹ 1,31,000] = ₹ 26,200.

Alternative presentation using incremental approach

	₹
Incremental sales [15,00,000 – 12,00,000]	3,00,000
Less: Incremental variable cost [12,00,000 – 9,60,000]	2,40,000
Less: Incremental Bad debts [30,000 – 24,000]	6,000
Less: Incremental Cash discount [24,000 – 6,000]	18,000
Increase in Profit Before Tax	**36,000**
Less: Tax @ 30%	10,800
Increase in Profit After Tax	**25,200**

Add: **Savings in opportunity cost** [16,000 - 15,000]	**1,000**
Increase in Net Profit	**26,200**

Advise: Proposed policy should be adopted since the net benefit is increased by [₹ 1,57,200 - ₹ 1,31,000]

= ₹ 26,200.

2.

[i] Computation of Average Cash balance:

Annual cash outflow [U] = 9,00,000 x 4 = ₹ 36,00,000

Fixed cost per transaction [P] = ₹ 60

Opportunity cost of one rupee p.a. [S] = 12 / 100 = 0.12

Optimum cash balance [C] = $\sqrt{\frac{2UP}{S}} = \sqrt{\frac{2\times 36,00,000\times 60}{0.12}} = \text{Rs.}60,000$

$\therefore$ Average Cash balance = $\frac{(0+60,000)}{2} = \text{Rs.}30,000$

[ii] Number of conversions p.a.

Annual cash outflow = ₹ 36,00,000

Optimum cash balance = ₹ 60,000

$\therefore$ No. of conversions p.a. = 36,00,000 / 60,000 = 60

[iii] Time interval between two conversions

No. of days in a year = 360

No. of conversions p.a. = 60

$\therefore$ Time interval = 360 / 60 = 6 days

3.

Annual Consumption = 36,000 [A]

Ordering Cost = ₹ 250 per order [O]

Carrying Cost = 4.5 / 100 x 100

= ₹ 4.5 [C]

Lead Time = 25 days

[i] Reorder Level = Lead Time × Daily Consumption

= 25 x 36,000 / 360

= 2,500 units

[ii] Economic Order Quantity [EOQ] = $\sqrt{\frac{2AO}{C}}$

= $\sqrt{\frac{2\times 36,000\times 250}{4.5}}$

= 2,000 units

[iii] Evaluation of Profitability of Quantity Discount Offer:

[a] When EOQ is ordered

		[₹]
Purchase Cost	[36,000 units ₹ 100]	36,00,000
Ordering Cost	[[36,000 units/2,000 units] ₹ 250]	4,500
Carrying Cost	[2,000 units ½ ₹ 4.5] 4,500	
Total Cost		**36,09,000**

[b] When Quantity Discount is accepted

		[₹]
Purchase Cost	[36,000 units ₹ 99*]	35,64,000
Ordering Cost	[[36,000 units/9,000 units] ₹ 250]	1,000
Carrying Cost	[9,000 units ½ ₹ 99 x 4.5%]	20,048
Total Cost		35,85,048

*Unit Cost = ₹ 100

Less: Quantity Discount @ 1% = ₹ 1

Purchase Cost = ₹99

Advise – The total cost of inventory is lower if Quantity Discount is accepted.

Hence, the company is advised to accept the proposal.

4.

Working Notes:

[1] Calculation of cash and credit sales **[₹ in thousands]**

	Nov	**. Dec**	**Jan.**	**Feb.**	**Mar.**
Total Sales	640	880	600	600	800
Cash Sales [1/5th of total sales]	128	176	120	120	160
Credit Sales [4/5th of total sales]	512	704	480	480	640

[2] Calculation of Credit Sales Receipts [₹ in thousands]

Month	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**
Forecast Credit sales [Working note 1]	512.00	704.00	480.00	480.00	640.00
Receipts:					
15% in the month of sales			72.00	72.00	96.00
25% in next month			176.00	120.00	120.00
58% in next to next month			296.96	408.32	278.40
Total			544.96	600.32	494.40

Cash Budget

[₹ in thousands]

	Nov.	Dec.	Jan.	Feb.	Mar.
Opening Balance [A]			50.00	174.96	355.28
Sales	640.00	880.00	600.00	600.00	800.00
Receipts:					
Cash Collection [Working note 1]			120.00	120.00	160.00
Credit Collections [Working note 2]			544.96	600.32	494.40
Total [B]			664.96	720.32	654.40
Purchases [90% of sales in the month prior to sales]		540	540	720	
Payments:					
Payment for purchases [next month]			540	540	720
Total [C]			540	540	720
Closing balance[D] = [A + B – C]			174.96	355.28	289.68

5.

Statement showing the Evaluation of Credit policies [Total Approach]

Particulars		**Present Policy [2 Months]**	**Proposed Policy X [1.5 Months]**	**Proposed Policy Y [1 Month]**
		₹ in lakhs	**₹ in lakhs**	**₹ in lakhs**
A.			**Expected Profit:**	
	[a] Credit Sales*	360	360	360
	[b] Total Cost other than Bad Debts and collection expenditure [360/150 x 120]	288	288	288
	[c] Bad Debts	10.8 [360 x 0.03]	7.2 [360 x 0.02]	3.6 [360 x 0.01]
	[d] Collection expenditure	8	12	20
	[e] Expected Profit [[a] – [b] – [c] - [d]]	53.2	52.8	48.4
B.	**Opportunity Cost of Investments in Receivables [Working Note]**	9.6	7.2	4.8
C.	**Net Benefits [A – B]**	43.6	45.6	43.6

Recommendation: The Proposed Policy X should be followed since the net benefits under this policy are higher as compared to other policies.

*Note: It is assumed that all sales are on credit.

Working Note:

Calculation of Opportunity Cost of Average Investments

Opportunity Cost = [Total Cost × Collection period / 12] x [Rate of Return x 100]

Present Policy = ₹ 288 lakhs × [2 / 12] x [20 / 100] = ₹ 9.6 lakhs

Policy X = ₹ 288 lakhs × 1.5 / 12 x 20 / 100 = ₹ 7.2 lakhs

Policy Y = ₹ 288 lakhs × 1/ 12 x 20 / 100 = ₹ 4.8 lakhs

Alternatively

Statement showing the Evaluation of Credit policies [Incremental Approach]

	Particulars	Present Policy [2 Months]	Proposed Policy X [1.5 Months]	Proposed Policy Y [1 Month]
		₹ in lakhs	₹ in lakhs	₹ in lakhs
	[a] Credit Sales*	360	360	360
	[b] Cost of sales [360/150 x 120]	288	288	288
	[c] Receivables [Refer Working Note]	48	36	24
	[d] Reduction in receivables from present policy	-	12	24
[A]	**Savings in Opportunity Cost of Investment in Receivables [@ 20%]**	**-**	**2.4**	**4.8**
	[e] Bad Debts	10.8 [360 x 0.03]	7.2 [360 x 0.02]	3.6 [360 x 0.01]
[B]	**Reduction in bad debts from present policy**	**-**	**3.6**	**7.2**
	[f] Collection expenditure	8	12	20
[C]	**Increase in Collection expenditure from Present policy**	**-**	**4**	**12**
[D]	**Net Benefits [A +B-C]**		2	0

Recommendation: The Proposed Policy X should be followed since the net benefits under this policy are higher as compared to other policies.

***Note:** It is assumed that all sales are on credit.

Working Note:

Calculation of Investment in Receivables

= Total Cost × Collection period / 12

Present Policy = ₹ 288 lakhs × 2 / 12 = ₹ 48 lakhs

Policy X = ₹ 288 lakhs × 1.5 / 12 = ₹ 36 lakhs

Policy Y = ₹ 288 lakhs × 1 / 12 = ₹ 24 lakhs

6.

[i] Calculation of Operating Cycle Period:

Operating Cycle Period = R + W + F + D – C

= 45 + 20 + 25 + 30 – 60 = 60 days

[ii] Number of Operating Cycle in a Year

= 360 / Operating cycle period= 360 / 60 = 6

[iii] Amount of Working Capital Required

= Annual operating cost / Number of operating cycle

= ₹ 25,00,000 - ₹ 2,50,000 / 6 = ₹ 22,50,000 / 6 = ₹ 3,75,000

[iv] Reduction in Working Capital

Operating Cycle Period = R + W + F – C

= 45 + 20 + 25 – 60 = **30 days**

Amount of Working Capital Required = = ₹ 1,87,500

Reduction in Working Capital = ₹ 3,75,000 – ₹ 1,87,500 = ₹ **1,87,500**

Note: If we use Total Cost basis, then amount of Working Capital required will be ₹ 4,16,666.67 [approx.] and Reduction in Working Capital will be ₹ 2,08,333.33 [approx.]

7. .

Statement showing the requirements of Working Capital [Cash Cost basis]

Particulars	[₹]	[₹]
A. Current Assets:		
Inventory:		
Stock of Raw material [₹ 27,00,000 × 3/12]	6,75,000	
Stock of Finished goods [₹ 77,40,000 × 3/12]	19,35,000	
Receivables [₹ 88,20,000 × 3/12]	22,05,000	
Administrative and Selling Overhead [₹ 10,80,000 × 1/12]	90,000	
Cash in Hand	3,00,000	
Gross Working Capital	52,05,000	**52,05,000**
B. Current Liabilities:		
Payables for Raw materials* [₹ 27,00,000 × 3/12]	6,75,000	
Outstanding Expenses:		
Wages Expenses [₹ 21,60,000 × 1/12]	1,80,000	
Manufacturing Overhead [₹ 28,80,000 × 1/12]	2,40,000	
Total Current Liabilities	10,95,000	10,95,000
Net Working Capital [A-B]		**41,10,000**
Add: Safety margin @ 10%		4,11,000
Total Working Capital requirements		**45,21,000**

Working Notes:

[i]

A] Computation of Annual Cash Cost of Production	[₹]
Raw Material consumed	27,00,000
Wages [Labour paid]	21,60,000
Manufacturing overhead [₹ 32,40,000 - ₹ 3,60,000]	28,80,000
Total cash cost of production	77,40,000
[B] Computation of Annual Cash Cost of Sales	**[₹]**
Cash cost of production as in [A] above	77,40,000
Administrative & Selling overhead	10,80,000
Total cash cost of sales	88,20,000

*Purchase of Raw material can also be calculated by adjusting Closing Stock and Opening Stock [assumed nil]. In that case Purchase will be Raw material consumed +Closing Stock-Opening Stock i.e ₹ 27,00,000 + ₹ 6,75,000 - Nil = ₹ 33,75,000. Accordingly, Total Working Capital requirements [₹ 43,35,375] can be calculated.

8.

Working Notes:

[1] Calculation of Collection from Trade Receivables:

Particulars	December	January	February	March
Sales [units]	1,800	1,875	1,950	2,100
Sales [@ ₹ 600 per unit] / Trade Receivables [Debtors] [₹]	10,80,000	11,25,000	11,70,000	12,60,000
Collection from Trade Receivables [Debtors] [₹]	10,80,000	11,25,000	11,70,000	

[2] Calculation of Payment to Trade Payables:

Particulars	December	January	February	March
Output [units]	1,875	1,950	2,100	2,250
Raw Material [2 units per output] [units]	3,750	3,900	4,200	4,500
Raw Material [@ ₹ 150 per unit] / Trade Payables [Creditors] [₹]	5,62,500	5,85,000	6,30,000	6,75,000
Payment to Trade Payables [Creditors] [₹]		5,62,500	5,85,000	6,30,000

[3] Calculation of Variable Overheads and Wages:

Particulars	January	February	March
Output [units]	1,950	2,100	2,250
Payment in the same month @ ₹ 100 per unit [₹]	1,95,000	2,10,000	2,25,000

[a] Preparation of Cash Budget

Particulars	January [₹]	February [₹]	March [₹]
Opening Balance	35,000	3,57,500	6,87,500

Receipts:			
Collection from Trade Receivables [Debtors]	10,80,000	11,25,000	11,70,000
Receipt of Long-Term Loan			2,00,000
Total [A]	11,15,000	14,82,500	20,57,500
Payments:			
Trade Payables [Creditors] for Materials	5,62,500	5,85,000	6,30,000
Variable Overheads and Wages	1,95,000	2,10,000	2,25,000
Purchase of Machinery			3,00,000
Total [B]	7,57,500	7,95,000	11,55,000
Closing Balance [A – B]	3,57,500	6,87,500	9,02,500

[b] Calculation of Current Ratio

Particulars	March [₹]
Output Inventory [i.e. units produced in March] [[2,250 units x 2 units of raw material per unit of output x ₹ 150 per unit of raw material] + 2,250 units x ₹ 100 for variable overheads and wages] or, [6,75,000 + 2,25,000] from Working Notes 2 and 3	9,00,000
Trade Receivables [Debtors]	12,60,000
Cash Balance	9,02,500
Current Assets	30,62,500
Trade Payables [Creditors]	6,75,000
Current Liabilities	6,75,000
Current Ratio [Current Assets / Current Liabilities]	4.537 approx.

9.

Statement Showing Evaluation of Credit Policies

	Particulars	Present Policy	Proposed Policy
A.	Expected Contribution		
	[a] Credit Sales	30,00,000	36,00,000
	[b] Less: Variable Cost	16,80,000	20,16,000
	[c] Contribution	13,20,000	15,84,000
	[d] Less: Bad Debts 60,000 1,08,000		
	[e] Contribution after Bad debt [[c]-[d]] 12,60,000 14,76,000		
B.	Opportunity Cost of investment in Receivables	15,000	54,000
C.	Net Benefits [A-B]	12,45,000	14,22,000
D.	Increase in Benefit		1,77,000

Recommendation: Proposed Policy i.e credit from 15 days to 45 days should be implemented by NM Ltd since the net benefit under this policy are higher than those under present policy

Working Note: [1]

	Present Policy [₹]	Propose Policy [₹]
Sales	30,00,000	36,00,000
Cost of Sales [80% of sales]	24,00,000	28,80,000
Variable cost [70% of cost of sales]	16,80,000	20,16,000

2. Opportunity Costs of Average Investments

= Variable Cost × Collection Period / 360 × Rate of Return

Present Policy = 24,00,000×45 / 360 ×15% ₹ = ₹ 54,000

Proposed Policy = 28,80,000 × 15/360 × 15%₹ = ₹ 18,000

10.

Statement showing the Evaluation of credit Policies

Particulars	Proposed Policy ₹
A. Expected Profit:	
[a] Credit Sales	30,00,000
[b] Total Cost [i] Variable Costs	29,00,000
[ii] Recurring Costs	10,000
	29,10,000
[c] Bad Debts	60,000
[d] Expected Profit [[a] – [b] – [c]]	30,000
B. Opportunity Cost of Investments in Receivables	1,00,395
C. Net Benefits [A – B]	[70,395]

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

Working Note: Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × Collection period / 360 x Rate of Return / 100

Particulars	20%	30%	30%	18%	Total
A. Total Cost	5,82,000	8,73,000	8,73,000	5,23,800	28,51,800
B. Collection period	30/360	60/360	90/360	100/360	
C. Required Rate of Return	18%	18%	18%	18%	
D. Opportunity Cost [A × B × C]	8,730	26,190	39,285	26,190	1,00,395

11.

Working Notes:

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

[ii] Closing Stock = Cost of Goods Sold / Stock Turnover
= 68,25, 000 /6 = ₹ 11,37,500

[iii] Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
= 68,25,000 / 1.5 = ₹ 45,50,000

[iv] Current Assets:

Current Ratio = 2.5 and Liquid Ratio = 1.5

Inventories [Stock] = 2.5 – 1.5 = 1

Current Assets = Amount of Inventories [Stock] x 2.5 / 1
= 11,37,500 x 2.5 / 1 = ₹ 28,43,750

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

[vi] Receivables [Debtors] = Sales x Debtors Collection period / 12
= ₹ 1,05,00,000 × 1/12 = ₹ 8,75,000

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

[viii] Net worth = = Fixed Assets / 1.3
= 45,50,000 / 1.3₹
= ₹ 35,00,000

[ix] Reserves and Surplus

Reserves and Share Capital = Net worth

Net worth = 1 + 1.5 = 2.5

Reserves and Surplus = ₹ 35,00,000 x 1 / 2.5 = ₹ 14,00,000

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

[xi] Current Liabilities = Current Assets/ Current Ratio
= 28, 43, 750 / 2.5 = ₹ 11,37,500

[xii] Long-term Debts

Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund

Long-term Debts = ₹ 35,00,000 × 0.7875 = ₹ 27,56,250

[a] Balance Sheet

Particulars	Figures as at 31-03-2022 [₹]	Figures as at 31-03-2021 [₹]
I. EQUITY AND LIABILITIES		
Shareholders' funds		
[a] Share capital	21,00,000	-
[b] Reserves and surplus	14,00,000	-
Non-current liabilities		
[a] Long-term borrowings	27,56,250	-
Current liabilities	11,37,500	-
TOTAL	**73,93,750**	**-**
II. ASSETS		
Non-current assets		
Fixed assets	45,50,000	-
Current assets		
Inventories	11,37,500	-
Trade receivables	8,75,000	-
Cash and cash equivalents	8,31,250	-
TOTAL	**73,93,750**	-

[b] Statement Showing Working Capital Requirement

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

12.

Evaluation of Credit Policies

Particulars	**1.5/15 net 45**	**2/20 net 50**

A	Sales	₹ 50,00,000	₹ 55,00,000
B	Variable Cost [65%]	₹ 32,50,000	₹ 35,75,000
C	Fixed Cost [20% in 1st Case]	₹ 10,00,000	₹ 10,00,000
D	Bad Debts [5% and 10%]	₹ 2,50,000	₹ 5,50,000
E	Discounts		
	[₹ 5000000x30%x1.5%]	₹ 22,500	-
	[₹ 5500000x50%x2%]	-	₹ 55,000
F	PBT [A-B-C-D-E]	₹ 4,77,500	₹ 3,20,000
G	Tax @ 35%	₹ 1,67,125	₹ 1,12,000
H	PAT	₹ 3,10,375	₹ 2,08,000
I	Opportunity Cost		
	[₹ 3250000 + ₹ 1000000] x 30/360x10%	₹ 35,417	-
	[₹ 3575000 + ₹ 1000000] x 25/360 x 10%	-	₹ 31,771
J	**Net Benefit**	₹ 2,74,958	₹ 1,76,229

The new policy leads to lower net benefit for the company. Hence it should not be implemented.

13.

Cost Structure

Particulars	**Calculations**	**P.U.**	**Amount [p.u. X units]**	**Calculations**	**P.U.**	**Amount [p.u. X units]**
Direct Material	40% of SP	₹ 24	₹ 28,80,000	Same as PY	₹ 24	₹ 43,20,000
Direct labour	Given	₹ 20	₹ 24,00,000	20*1.1	₹ 22	₹ 39,60,000
Direct Expenses	bal. fig.	₹ 4	₹ 4,80,000	4*1.5	₹ 6	₹ 10,80,000
Total Cost	SP - Profit	₹ 48	₹ 57,60,000		₹ 52	₹ 93,60,000
Profit	[SP/125x25]	₹ 12	₹ 14,40,000	52*25%	₹ 13	₹ 23,40,000
Sales	3 x Direct Labour p.u.	₹ 60	₹ 72,00,000		₹ 65	₹ 1,17,00,000
*units=		₹ 72,00,000 / ₹ 60 =1,20,000			1,20,000/60 x 90=1,80,000	

Operating Cycle

Raw material holding period	1 month
Finished Goods holding period	2 months
WIP conversion period	2 months

Creditor Payment Period	2 months
Receivables Collection Period	2/3 months

Estimation of Working Capital

Particulars	**Calculation**	**Amount**
Current Assets		
Stock of Raw Material	43,20,000 x 1/12	₹ 3,60,000
Stock of WIP		
RM cost	₹ 43,20,000	
Labour cost	₹ 19,80,000	
Direct Exp cost	₹ 5,40,000	
Total WIP Cost	₹ 68,40,000	
Stock of WIP	68,40,000 x 2/12	₹ 11,40,000
Stock of Finished Goods	93,60,000 x 2/12	₹ 15,60,000
Receivables [on sales]		
A	1,17,00,000 x 50% x 2/12	₹ 9,75,000
B	1,17,00,000 x 30% x 3/12	₹ 8,77,500
C	NIL	-
Cash Balance	Given	₹ 1,11,000
Total Current Assets		₹ 50,23,500
Current Liabilities		
Payables	*₹ 44,40,000 x 2/12	₹ 7,40,000
Net Working Capital		₹ 42,83,500

Opening RM stock = 28,80,000 x 1/12= ₹ 2,40,000

* RM purchased = RM consumed – Opening Stock + Closing Stock

= ₹ 43,20,000 – ₹ 2,40,000 + ₹ 3,60,000

= ₹ 44,40,000

Computation of Maximum Permissible Bank Finance

Method	**Formula**	**Calculation**	₹
I	75% x [Current Assets-Current Liabilities]	75% x [₹ 50,23,500 - ₹ 7,40,000]	₹ 32,12,625
II	75% x Current Assets-Current Liabilities	75% x ₹ 50,23,500 - ₹ 7,40,000	₹ 30,27,625
III	75% x [Current Assets-Core CA]-Current Liabilities	75% x [₹ 50,23,500- ₹ 15,60,000] - ₹ 7,40,000	₹ 18,57,625

14.

Monthly Cash Budget [April-September] [₹]

	April	May	June	July	August	September
Opening cash balance	-	10,50,000	-	1,37,500	5,25,000	7,25,000
A. Cash inflows						
Equity shares	50,00,000	-	-	-	-	-
Loans [Refer to working note 1]	6,50,000	1,25,000	-	-	-	-
Receipt from debtors	-	-	15,00,000	17,50,000	17,50,000	20,00,000
Total [A]	56,50,000	11,75,000	15,00,000	18,87,500	22,75,000	27,25,000
B. Cash Outflows						
Plant and Machinery	10,00,000	-	-	-	-	-
Land and Building	20,00,000	-	-	-	-	-
Furniture	5,00,000	-	-	-	-	-
Motor Vehicles	5,00,000	-	-	-	-	-
Stock of raw materials [Minimum stock]	5,00,000	-	-	-	-	-
Miscellaneous expenses	50,000	-	-	-	-	-
Payment to creditors for credit purchases [Refer to working note 2]	-	10,25,000	12,12,500	12,12,500	14,00,000	14,00,000
Wages and salaries	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Admn. Expenses	50,000	50,000	50,000	50,000	50,000	50,000
Total :[B]	46,00,000	11,75,000	13,62,500	13,62,500	15,50,000	15,50,000
Closing balance [A]-[B]	10,50,000	-	1,37,500	5,25,000	7,25,000	11,75,000

Budgeted Income Statement for six-month period ending 30th September

Particulars	[₹]	Particulars	[₹]
To Purchases	83,37,500	By Sales	1,12,50,000
To Wages and Salaries	6,00,000	By Closing stock	5,00,000
To Gross profit c/d	28,12,500		
	1,17,50,000		1,17,50,000
To Admn. Expenses	3,00,000	By Gross profit b/d	28,12,500
To Depreciation [10% on ₹ 40 lakhs for six months]	2,00,000		
To Accrued interest on loan [Refer to working note 3]	45,250		
To Miscellaneous expenses	50,000		

To Net profit c/d	22,17,250		
	28,12,500		28,12,500

Projected Balance Sheet as on 30th September, 2021

Liabilities		Amount [₹]	Assets			Amount [₹]
Share Capital:			Fixed Assets:			
Authorised capital			Land and Building	20,00,000		
10,00,000 equity shares of ₹ 10 each		1,00,00,000	Less: Depreciation	1,00,000	19,00,000	
Issued, subscribed and paid up capital 5,00,000 equity shares of ₹ 10 each		50,00,000	Plant and Machinery	10,00,000		
Reserve and Surplus:			Less: Depreciation	50,000	9,50,000	
Profit and Loss		22,17,250	Furniture	5,00,000		
Long-term loans		7,75,000	Less: Depreciation	25,000	4,75,000	
Current liabilities and provisions:			Motor Vehicles	5,00,000		
Sundry creditors	15,87,500		Less: Depreciation	25,000	4,75,000	38,00,000
Accrued interest	45,250		Current Assets:			
Outstanding expenses	1,00,000	17,32,750	Stock	5,00,000		
			Sundry debtors	42,50,000		
			Cash	11,75,000	59,25,000	
		97,75,000				

Working Notes:

Subsequent Borrowings Needed [₹]

	April	May	June	July	August	September
A. Cash Inflow						
Equity shares	50,00,000					
Loans	6,50,000					
Receipt from debtors	-	-	15,00,000	17,50,000	17,50,000	20,00,000
Total [A]	56,50,000	-	15,00,000	17,50,000	17,50,000	20,00,000
B. Cash Outflow						
Purchase of fixed assets	40,00,000					
Stock	5,00,000					
Miscellaneous expenses	50,000					

Payment to creditors	-	10,25,000	12,12,500	12,12,500	14,00,000	14,00,000
Wages and salaries	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Administrative expenses	50,000	50,000	50,000	50,000	50,000	50,000
Total	46,00,000	11,75,000	13,62,500	13,62,500	15,50,000	15,50,000
Surplus/ [Deficit]	10,50,000	[11,75,000]	1,37,500	3,87,500	2,00,000	4,50,000
Cumulative balance	10,50,000	[1,25,000]	12,500	4,00,000	6,00,000	10,50,000

1. There is shortage of cash in May of ₹ 1,25,000 which will be met by borrowings in May.

2. Payment to Creditors

Purchases = Cost of goods sold - Wages and salaries

Purchases for April = [75% of 15,00,000] - ₹ 1,00,000 = ₹ 10,25,000

[Note: Since gross margin is 25% of sales, cost of manufacture i.e. materials plus wages and salaries should be 75% of sales]

Hence, Purchases = Cost of manufacture minus wages and salaries of ₹ 1,00,000]

The creditors are paid in the first month following purchases.

Therefore, payment in May is ₹ 10,25,000

The same procedure will be followed for other months.

April	[75% of 15,00,000] - ₹ 1,00,000	= ₹ 10,25,000
May	[75% of 17,50,000] - ₹ 1,00,000	= ₹ 12,12,500
June	[75% of 17,50,000] - ₹ 1,00,000	= ₹ 12,12,500
July	[75% of 20,00,000] - ₹ 1,00,000	= ₹ 14,00,000
August	[75% of 20,00,000] - ₹ 1,00,000	= ₹ 14,00,000
September	[75% of 22,50,000] - ₹ 1,00,000	= ₹ 15,87,500
Minimum Stock		₹ 5,00,000
Total Purchases		₹ 83,37,500

3. Accrued Interest on Loan

12% interest on ₹ 6,50,000 for 6 months	39,000
Add: 12% interest on ₹ 1,25,000 for 5 months	6,250
	45,250

15.

Computation of Operating Cycle

[1] Raw Material Storage Period [R]

Raw Material Storage Period [R] = Average Stock of Raw Material / Daily Average Consumption of Raw material

= [[14,40,000 + 16,00,000] / 2] / 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

[2] Conversion/Work-in-Process Period [W]

Conversion/Processing Period = Average Stock of WIP / Daily Average Production cost

= [[4,80,000 + 8,00,000] / 2] / 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

[3] Finished Goods Storage Period [F]

Finished Goods Storage Period = Average Stock of Finished Goods/Daily Average Cost of Good Sold

= [[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

[4] Receivables Collection Period [D]

Receivables Collection Period = Average Receivables / Dailyaveragecredit sales

= [[12,00,000 + 16,00,000] / 2] / 1,60,00,000 / 365

= 31.94 Days

[5] Payables Payment Period [C]

Payables Payment Period = Average Payables / Daily average credit purchase

= [[16,00,000 + 19,20,000] / 2] /88,00,000 / 365 = 73 Days

[6] 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 = Total Operating Expenses / Number of Operating Cycles per year

= 1,40,00,000 / 3.311 = ₹ 42,28,329.81

16.

Projected Profit and Loss Account for the year 3

Particulars	Year 2 Actual [₹ in lakhs]	Year 3 Projected [₹ in lakhs]	Particulars	Year 2 Actual [₹ in lakhs]	Year 3 Projected [₹ in lakhs]
To Materials consumed	140.00	168.00	By Sales	400.00	480.00
To Stores	48.00	57.60	By Misc. Income	4.00	4.00
To Mfg. Expenses	64.00	76.80			
To Other expenses	40.00	60.00			
To Depreciation	40.00	40.00			
To Net profit	72.00	81.60			
	404.00	**484.00**		**484.00**	**484.00**

Cash Flow:

Particulars	[₹ in lakhs]
Profit	81.60
Add: Depreciation	40.00
121.60	
Less: Cash required for increase in stock	20.00
Net cash inflow	**101.60**

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

Working Notes:

[i] Material consumed in year 1 = [32 + 120 – 40]/320 = 35%

Material consumed in year 2 = [40 + 160 – 60]/400 = 35%

Likely consumption in year 3 = 480 ×35/100 = ₹ 168 [lakhs]

[ii] Stores are 12% of sales & Manufacturing expenses are 16% of sales for both the years.

17.

Statement showing the requirements of Working Capital

Particulars	[₹]	[₹]
A. Current Assets:		
Inventory:		
Stock of Raw material [₹ 2,31,840 × 2/12]	38,640	
Stock of Work-in-progress [As per Working Note]	39,240	
Stock of Finished goods [₹ 3,51,600 × 10/100]	35,160	
Receivables [Debtors] [₹ 3,04,992 × 2/12]	50,832	
Cash in Hand	19,200	
Prepaid Expenses:		
Wages & Mfg. Expenses [₹ 1,59,000 × 1/12]	13,250	
Administrative expenses [₹ 33,600 × 1/12]	2,800	
Selling & Distribution Expenses [₹ 31,200 × 1/12]	2,600	
Advance taxes paid {[70% of ₹ 24,000] × 3/12}	4,200	
Gross Working Capital	2,05,922	2,05,922
		B. Current Liabilities:
Payables for Raw materials [₹ 2,70,480 × 1.5/12]	33,810	
Provision for Taxation [Net of Advance Tax] [₹ 24,000 × 30/100]	7,200	
Total Current Liabilities	41,010	41,010
C. Excess of CA over CL		1,64,912
Add: 10% for unforeseen contingencies		16,491
Net Working Capital requirements		1,81,403

Working Notes:

[i] Calculation of Stock of Work-in-progress

Particulars	[₹]
Raw Material [₹ 2,01,600 × 15%]	30,240
Wages & Mfg. Expenses [₹ 1,50,000 × 15% × 40%]	9,000
Total	39,240

[ii] Calculation of Stock of Finished Goods and Cost of Sales

Particulars	[₹]
Direct material Cost [₹ 2,01,600 + ₹ 30,240]	2,31,840
Wages & Mfg. Expenses [₹ 1,50,000 + ₹ 9,000]	1,59,000
Depreciation	0
Gross Factory Cost	3,90,840

Less: Closing W.I.P.	[39,240]
Cost of goods produced	3,51,600
Add: Administrative Expenses	33,600
3,85,200	
Less: Closing stock	[35,160]
Cost of Goods Sold	3,50,040
Add: Selling and Distribution Expenses	31,200
Total Cash Cost of Sales	3,81,240
Debtors [80% of cash cost of sales]	3,04,992

[iii] Calculation of Credit Purchase

Particulars	[₹]
Raw material consumed	2,31,840
Add: Closing Stock	38,640
Less: Opening Stock	-
Purchases	2,70,480

18.

[i] Bank loan: Since the compensating balance would not otherwise be maintained, the real annual cost of taking bank loan would be:

= 15 / 90 × 100 = 16.67% p.a.

[ii] Trade credit: Amount upto ₹ 1,50,000 can be raised within 2 months or 60 days. The real annual cost of trade credit would be:

= 3 / 97 x 360 / 60 x 100 = 18.56% p.a.

[iii] Factoring:

Commission charges per year = 2% x [₹ 2,00,000 x 12] = ₹ 48,000

Total Savings per year = [₹ 1,250 + ₹ 1,750] x 12 = ₹ 36,000

Net factoring cost per year = ₹ 48,000 - ₹ 36,000 = ₹ 12,000

Annual Cost of Borrowing ₹ 1,50,000 receivables through factoring would be:

= [12% x 1,50,000 + 12,000 / ₹ 1,50,000 x 100

= [₹ 18,000 + ₹ 12,000 / ₹ 1,50,000] x 100 = 20% p.a.

Advise: The company should select alternative of Bank Loan as it has the lowest annual cost i.e. 16.67% p.a.

19.

Preparation of Statement of Working Capital Requirement for Trux Company Ltd.

	[₹]	[₹]
A. Current Assets		

[i] Inventories:		
Material [1 month] $\left(\frac{Rs.6,75,000}{12months}\times 1month\right)$	56,250	
Finished goods [1 month] $\left(\frac{Rs.21,60,000}{12months}\times 1month\right)$	1,80,000	2,36,250
[ii] Receivables [Debtors]		
For Domestic $\left(\frac{Rs.15,17,586}{12months}\times 1month\right)$	1,26,466	
For Export Sales $\left(\frac{Rs.7,54,914}{12months}\times 3months\right)$	1,88,729	3,15,195
[iii] Prepayment of Selling expenses $\left(\frac{Rs.1,12,500}{12months}\times 3months\right)$		28,125
[iv] Cash in hand & at bank		1,75,000
Total Current Assets		7,54,570
B. Current Liabilities:		
[i] Payables [Creditors] for materials [2 months] $\left(\frac{Rs.6,75,000}{12months}\times 2months\right)$		1,12,500
[ii] Outstanding wages [0.5 months] $\left(\frac{Rs.5,40,000}{12months}\times 0.5month\right)$		22,500
[iii] Outstanding manufacturing expenses $\left(\frac{Rs.7,65,000}{12months}\times 1month\right)$		63,750
[iv] Outstanding administrative expenses $\left(\frac{Rs.1,80,000}{12months}\times 1month\right)$		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 = ₹ 10 / ₹ 90 x 100 = 11.11%

3. Apportionment of Selling expenses between Domestic and Exports sales:

Apportionment on the basis of sales value:

Domestic Sales = ₹ 1,12,500 x ₹ 26,10,000 x ₹ 18,00,000 = ₹ 77,586

Exports Sales = ₹ 1,12,500 / ₹ 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.

20.

Workings:

[1] Statement of cost at single shift and double shift working

	24,000 units		**48,000 Units**	
	Per unit [₹]	**Total [₹]**	**Per unit [₹]**	**Total [₹]**
Raw materials	24	5,76,000	21.6	10,36,000
Wages:				
Variable	12	2,88,000	12	5,76,000
Fixed	8	1,92,000	4	1,92,000
Overheads:				
Variable	4	96,000	4	1,92,000
Fixed	16	3,84,000	8	3,84,000
Total cost	64	15,36,000	49.6	23,80,800
Profit	8	1,92,000	22.4	10,75,200
Sales	72	17,28,000	72	34,56,000

[2] Sales in units 2020-21 = Sales / Unit selling price = ₹ 17,28,000 / ₹ 72 = 24,000 units

[3] Stock of Raw Materials in units on 31.3.2021

= Value of stock / Cost per unit = ₹ 1,44, 000 / ₹ 24 = 6,000 units

[4] Stock of work-in-progress in units on 31.3.2021

= Value of work- in-progress/ Prime Cost per unit = ₹ 88,000 /₹ [24 + 20] = 2,000units

[5] Stock of finished goods in units 2020-21

= Value of stock / Total Cost per unit = ₹ 2,88,000 / ₹ 64 = 4,500 units.

Comparative Statement of Working Capital Requirement

	Single Shift [24,000 units]			**Double Shift [48,000 units]**		
	Units	**Rate [₹]**	**Amount [₹]**	**Units**	**Rate [₹]**	**Amount [₹]**
Current Assets						
Inventories:						
Raw Materials	6,000	24	1,44,000	12,000	21.6	2,59,200
Work-in-Progress	2,000	44	88,000	2,000	37.6	75,200
Finished Goods	4,500	64	2,88,000	9,000	49.6	4,46,400
Sundry Debtors	6,000	64	3,84,000	12,000	49.6	5,95,200
Total Current Assets [A]			9,04,000			13,76,000
Current Liabilities						
Creditors for Materials	4,000	24	96,000	8,000	21.6	1,72,800
Creditors for Wages	2,000	20	40,000	4,000	16	64,000
Creditors for Overheads	2,000	20	40,000	4,000	12	48,000
Total Current Liabilities [B]			1,76,000		2,84,800	
Working Capital [A] – [B]			**7,28,000**		**10,91,200**	

Analysis: Additional Working Capital requirement = ₹ 10,91,200 – ₹ 7,28,000 = ₹ 3,63,200, if the policy to increase output is implemented.

21.

Statement showing Working Capital Requirements of TN Industries Ltd. [on cash cost basis]

	Amount in [₹]	**Amount in [₹]**
A. Current Assets		
[i] Inventories:		
Raw material		
$X\left(\frac{1,50,000 units \times Rs.30}{12 months} \times 2 months\right)$	7,50,000	
$Y\left(\frac{1,50,000 units \times Rs.7}{12 months} \times 1 month\right)$	87,500	
$Z\left(\frac{1,50,000 units \times Rs.6}{12 months} \times 1 month\right)$	75,000	

WIP $\left(\frac{1,50,000\text{units}\times\text{Rs.}64}{12\text{months}}\times 0.5\text{month}\right)$	4,00,000	
Finished goods $\left(\frac{1,50,000\text{units}\times\text{Rs.}88}{12\text{months}}\times 1\text{month}\right)$	11,00,000	24,12,500
[ii] Receivables [Debtors] $\left(\frac{1,50,000\text{units}\times\text{Rs.}103}{12\text{months}}\times 2\text{months}\right)\times 0.75$	19,31,250	
[iii] Cash and bank balance	8,00,000	
Total Current Assets	**51,43,750**	
B. Current Liabilities:		
[i] Payables [Creditors] for Raw materials		
X $\left(\frac{1,50,000\text{units}\times\text{Rs.}30}{12\text{months}}\times 2\text{months}\right)$	7,50,000	
Y $\left(\frac{1,50,000\text{units}\times\text{Rs.}7}{12\text{months}}\times 1\text{month}\right)$	87,500	
Z $\left(\frac{1,50,000\text{units}\times\text{Rs.}6}{12\text{months}}\times 0.5\text{month}\right)$	37,500	8,75,000
[ii] Outstanding Direct Labour $\left(\frac{1,50,000\text{units}\times\text{Rs.}25}{12\text{months}}\times 0.5\text{month}\right)$		1,56,250
[iii] Outstanding Manufacturing and administration overheads $\left(\frac{1,50,000\text{units}\times\text{Rs.}20}{12\text{months}}\times 1\text{month}\right)$		2,50,000
[iv] Outstanding Selling overheads $\left(\frac{1,50,000\text{units}\times\text{Rs.}15}{12\text{months}}\times 1\text{month}\right)$		1,87,500
Total Current Liabilities		**14,68,750**
Net Working Capital Needs [A – B]		**36,75,000**
Add: Provision for contingencies @ 10%		3,67,500
Working capital requirement		**40,42,500**

Workings:

1.

[i] Computation of Cash Cost of Production	**Per unit [₹]**
Raw Material consumed	43
Direct Labour	25
Manufacturing and administration overheads	20
Cash cost of production	88

[ii] Computation of Cash Cost of Sales	Per unit [₹]
Cash cost of production as in [i] above	88
Selling overheads	15
Cash cost of sales	103

2. Calculation of cost of WIP

Particulars	Per unit [₹]
Raw material [added at the beginning]:	
X	30
Y	7
Z [₹ 6 x 50%]	3
Cost during the year:	
Z {[₹ 6 x 50%] x 50%}	1.5
Direct Labour [₹ 25 x 50%]	12.5
Manufacturing and administration overheads [₹ 20 x 50%]	10
	64

22.

A. Statement showing the Evaluation of Debtors Policies [Total Approach]

[Amount in ₹]

	Particulars	Present Policy 45 days	Proposed Policy W 60 days	Proposed Policy X 75 days	Proposed Policy Y 90 days	Proposed Policy Z 115 days
I.	**Expected Profit:**					
	[a] Credit Sales	9,00,000	9,60,000	9,90,000	10,50,000	11,10,000
	[b] Total Cost other than Bad Debts					
	[i] Variable Costs [Sales × 2/ 3]	6,00,000	6,40,000	6,60,000	7,00,000	7,40,000
	[ii] Fixed Costs	75,000	75,000	75,000	75,000	75,000
		6,75,000	7,15,000	7,35,000	7,75,000	8,15,000
	[c] Bad Debts	9,000	14,400	19,800	31,500	44,400
	[d] Expected Profit [[a] – [b] – [c]]	2,16,000	2,30,600	2,35,200	2,43,500	2,50,600

II.	**Opportunity Cost of Investments in Receivables**	16,875	23,833	30,625	38,750	52,069
III.	**Net Benefits [I – II]**	1,99,125	2,06,767	2,04,575	2,04,750	1,98,531

Recommendation: The Proposed Policy W [i.e. increase in collection period by 15 days or total 60 days] should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Notes:

[i] Calculation of Fixed Cost = [Average Cost per unit – Variable Cost per unit] × No. of Units sold

= [₹ 2.25 - ₹ 2.00] × [₹ 9,00,000/3]

= ₹ 0.25 × 3,00,000 = ₹ 75,000

[ii] Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × Collection period / 360 × Rate of Return/ 100

Present Policy = 6,75,000 × 45 / 360 × 20/ 100 = 16,875

Policy W = 7,15,000 × 60 / 360 × 20 / 100 = 23,833

Policy X = 7,35,000 × 75 / 360 × 20/100 = 30,625

Policy Y = 7,75,000 × 90 / 360 × 20 / 100 = 38,750

Policy Z = 8,15,000 × 115 / 360 × 20 / 100 = 52,069

B. Another method of solving the problem is **Incremental Approach**. Here we assume that sales are all credit sales. **[Amount in ₹]**

Particulars		**Present Policy 45 days**	**Proposed Policy W 60 days**	**Proposed Policy X 75 days**	**Proposed Policy Y 90 days**	**Proposed Policy Z 115 days**
I.	Incremental Expected Profit:					
	[a] Incremental Credit Sales	0	60,000	90,000	1,50,000	2,10,000
	[b] Incremental Costs					
	[i] Variable Costs	6,00,000	40,000	60,000	1,00,000	1,40,000
	[ii] Fixed Costs 75,000 - - - -					
	[c] Incremental Bad Debt Losses	9,000	5,400	10,800	22,500	35,400
	[d] Incremental Expected Profit [a – b –c]]	14,600	19,200	27,500	34,600	

II.	Required Return on Incremental Investments:					
	[a] Cost of Credit Sales	6,75,000	7,15,000	7,35,000	7,75,000	8,15,000
	[b] Collection period	45	60	75	90	115
	[c] Investment in Receivable [a × b/360]	84,375	1,19,167	1,53,125	1,93,750	2,60,347
	[d] Incremental Investment in Receivables	-	34,792	68,750	1,09,375	1,75,972
	[e] Required Rate of Return [in %]	20	20	20	20	
	[f] Required Return on Incremental Investments [d × e]	- 6,958	13,750	21,875	35,194	
III.	Net Benefits [I – II]	-	7,642	5,450	5,625	[594]

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

C. Another method of solving the problem is by computing the Expected Rate of Return.

$$\text{Expected Rate of Return} = \frac{\text{Incremental Expected Profit}}{\text{Incremental Investment in Receivables}} \times 100$$

For Policy W = ₹ 1 4,600 / ₹ 3 4,792 x 100 = 41.96%

For Policy X = ₹ 19,200 / ₹ 68,750 x 100 = 27.93%

For Policy Y = ₹ 2 7,500 / ₹ 1 ,09,375 x 100 = 25.14%

For Policy Z = ₹ 3 4,600 / ₹ 1 ,75,972 x 100 = 19.66%

Recommendation: The Proposed Policy W should be adopted since the Expected Rate of Return [41.96%] is more than the Required Rate of Return [20%] and is highest among the given policies compared.

23.

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:

Current Ratio = 2.5 and Liquid Ratio = 1.5

Inventories [Stock] = 2.5 – 1.5 = 1

Current Assets = Amount of Inventories [Stock] × 2.5/1

= ₹ 9,75,000 × 2.5/1

= ₹ 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 × Debtors Collection period /12

= ₹ 90,00,000 × 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 Share Capital = Net worth

Net worth = 1 + 1.5 = 2.5

Reserves and Surplus = ₹ 30,00,000 × 1/2.5

= ₹ 12,00,000

[x] Share Capital = Net worth – Reserves and Surplus

= ₹ 30,00,000 – ₹ 12,00,000

= ₹ 18,00,000

[xi] Current Liabilities = Current Assets/ Current Ratio

= ₹ 24,37,500/2.5

= ₹ 9,75,000

[xii] Long-term

Debts Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund

Long-term Debts = ₹ 30,00,000 × 0.7875 = ₹ 23,62,500

[a] Balance Sheet of the Company

Particulars	Figures as at 31-03-2020 [₹]	Figures as at 31-03-2019 [₹]
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

Particulars	[₹]	[₹]
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

24.

In case of customer A, there is no increase in sales even if the credit is given. Hence comparative statement for B & C is given below:

Particulars	Customer B				Customer C			
1. Credit period [days]	0	30	60	90	0	30	60	90
2. Sales Units	10,000	15,000	20,000	25,000	-	-	10,000	15,000
	₹ in lakh				₹ in lakh			
3. Sales Value	1,500	2,250	3,000	3,750	-	-	1,500	2,250

4. Contribution at 50% [A]	750	1,125	1,500	1,875	-	-	750	1,125
5. Receivables:-								
Credit Period × Sales / 360	-	187.5	500	937.5	-	-	250	562.5
6. Debtors at cost	-	93.75	250	468.75	-	-	125	281.25
7. Cost of carrying debtors at 20% [B]	-	18.75	50	93.75	-	-	25	56.25
8. Excess of contributions over cost of carrying debtors [A – B]	750	1,106.25	1,406.25	1,781.25	-	-	725	1,068.75

The excess of contribution over cost of carrying Debtors is highest in case of credit period of 90 days in respect of both the customers B and C. Hence, credit period of 90 days should be allowed to B and C.

25.

Calculation of Net Working Capital requirement

	[₹]	**[₹]**
A. Current Assets:		
Inventories:		
Stock of Raw material [Refer to Working note [iii]	1,44,000	
Stock of Work in progress [Refer to Working note [ii]	7,50,000	
Stock of Finished goods [Refer to Working note [iv]	20,40,000	
Debtors for Sales[Refer to Working note [v]	1,02,000	
Cash	2,00,000	
Gross Working Capital	32,36,000	32,36,000
B. Current Liabilities:		
Creditors for Purchases [Refer to Working note [vi]	1,56,000	
Creditors for wages [Refer to Working note [vii]	23,250	
	1,79,250	1,79,250
Net Working Capital [A - B]		30,56,750

Working Notes:

[i] Annual cost of production

	[₹]
Raw material requirements {[31,200 × ₹ 40] + [12,000 x ₹ 40]}	17,28,000
Direct wages {[31,200 ×₹ 15] +[12,000 X ₹ 15 x 0.5]}	5,58,000
Overheads [exclusive of depreciation] {[31,200 × ₹ 30] + [12,000 x ₹ 30 x 0.5]}	11,16,000
Gross Factory Cost	34,02,000

Less: Closing W.I.P [12,000 [₹ 40 + ₹ 7.5 + ₹ 15]]	[7,50,000]
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods [₹ 26,52,000 × 24,000/31,200]	[20,40,000]
Total Cash Cost of Sales*	6,12,000

[*Note: Alternatively, Total Cash Cost of Sales = [31,200 units – 24,000 units] x [₹ 40 + ₹ 15 + ₹ 30] = ₹ 6,12,000]

[ii] Work in progress stock

	[₹]
Raw material requirements [12,000 units × ₹ 40]	4,80,000
Direct wages [50% × 12,000 units × ₹ 15]	90,000
Overheads [50% × 12,000 units × ₹ 30]	1,80,000
	7,50,000

[iii] Raw material stock

It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year. Hence, the raw material consumption for the year [360 days] is as follows:

	[₹]
For Finished goods [31,200 × ₹ 40]	12,48,000
For Work in progress [12,000 × ₹ 40]	4,80,000
	17,28,000

Raw material stock = ₹ 17,28,000 / 360days × 30 days = ₹ 1,44,000

[iv] Finished goods stock:

24,000 units @ ₹ [40+15+30] per unit = ₹ 20,40,000

[v] Debtors for sale: ₹ 6,12,000 x 60days / 360 days = ₹ 1,02,000

[vi] Creditors for raw material Purchases [Working Note [iii]]:

Annual Material Consumed [₹ 12,48,000 + ₹ 4,80,000] ₹ 17,28,000

Add: Closing stock of raw material [[₹ 17,28,000 x 30 days] / 360 days] ₹ 1,44,000

₹ 18,72,000

Credit allowed by suppliers = ₹ 18,72,000 / 360 days × 30days = ₹ 1,56,000

[vii] Creditors for wages:

Outstanding wage payment = [[31,200 units x ₹ 15] + [12,000 units x ₹ 15 x .50]] x 15 days / 360 days

= ₹ 5,58,000 / 360days × 15days = ₹ 23,250

26.

[i] Projected Statement of Profit / Loss

[Ignoring Taxation]

	Year 1	Year 2
Production [Units]	12,000	18,000
Sales [Units]	10,000	17,000

	[₹]	[₹]
Sales revenue [A] [Sales unit × ₹ 192]	19,20,000	32,64,000
Cost of production:		
Materials cost [Units produced × ₹ 80]	9,60,000	14,40,000
Direct labour and variable expenses [Units produced × ₹ 40]	4,80,000	7,20,000
Fixed manufacturing expenses [Production Capacity: 24,000 units × ₹ 12]	2,88,000	2,88,000
Depreciation [Production Capacity : 24,000 units × ₹ 20]	4,80,000	4,80,000
Fixed administration expenses [Production Capacity : 24,000 units × ₹ 8]	1,92,000	1,92,000
Total Costs of Production	24,00,000	31,20,000
Add: Opening stock of finished goods [Year 1 : Nil; Year 2 : 2,000 units]	---	4,00,000
Cost of Goods available for sale [Year 1: 12,000 units; Year 2: 20,000 units]	24,00,000	35,20,000
Less: Closing stock of finished goods at average cost [year 1: 2000 units, year 2 : 3000 units] [Cost of Production × Closing stock/ units produced]	[4,00,000]	[5,28,000]
Cost of Goods Sold	20,00,000	29,92,000
Add: Selling expenses – Variable [Sales unit × ₹ 8]	80,000	1,36,000
Add: Selling expenses -Fixed [24,000 units × ₹ 2]	48,000	48,000
Cost of Sales : [B]	21,28,000	31,76,000
Profit [+] / Loss [-]: [A - B] [-]	2,08,000	[+] 88,000

Working Notes:

1. Calculation of creditors for supply of materials:

	Year 1 [₹]	Year 2 [₹]
Materials consumed during the year	9,60,000	14,40,000
Add: Closing stock [2 month's average consumption]	1,60,000	2,40,000
	11,20,000	16,80,000
Less: Opening Stock	---	1,60,000

Purchases during the year	11,20,000	15,20,000
Average purchases per month [Creditors]	93,333	1,26,667

2. Creditors for expenses:

	Year 1 [₹]	Year 2 [₹]
Direct labour and variable expenses	4,80,000	7,20,000
Fixed manufacturing expenses	2,88,000	2,88,000
Fixed administration expenses	1,92,000	1,92,000
Selling expenses [variable + fixed]	1,28,000	1,84,000
Total	10,88,000	13,84,000
Average per month	90,667	1,15,333

[ii] Projected Statement of Working Capital requirements

	Year 1 [₹]	**Year 2 [₹]**
Current Assets:		
Inventories:		
-Stock of materials [2 month's average consumption]	1,60,000	2,40,000
-Finished goods	4,00,000	5,28,000
Debtors [2 month's average sales] [including profit]	3,20,000	5,44,000
Cash	1,00,000	1,00,000
Total Current Assets / Gross working capital [A]	9,80,000	14,12,000
Current Liabilities:		
Creditors for supply of materials [Refer to working note 1]	93,333	1,26,667
Creditors for expenses [Refer to working note 2]	90,667	1,15,333
Total Current Liabilities: [B]	1,84,000	2,42,000
Estimated Working Capital Requirements: [A-B]	7,96,000	11,70,000

27.

Statement showing the Evaluation of credit Policies

Particulars	**Proposed Policy ₹**
A. Expected Profit:	
[a] Credit Sales	**40,00,000**
[b] Total Cost	
[i] Variable Costs [₹ 380 x 10000 units]	38,00,000
[ii] Recurring Costs	20,000

	38,20,000
[c] Bad Debts	**80,000**
[d] Expected Profit [[a] – [b] – [c]]	**1,00,000**
B. Opportunity Cost of Investments in Receivables	**1,31,790**
C. Net Benefits [A – B]	**[31,790]**

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

Working Note: Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × Collection period Rate of Return 360 x 100

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

28.

[i] Statement showing Working Capital Investment for each policy

[₹ in crore]

	Working Capital Policy		
	Conservative	**Moderate**	**Aggressive**
Current Assets: [i]	4.50	3.90	2.60
Fixed Assets: [ii]	2.60	2.60	2.60
Total Assets: [iii]	7.10	6.50	5.20
Current liabilities: [iv]	2.34	2.34	2.34
Net Worth: [v] = [iii] - [iv]	4.76	4.16	2.86
Total liabilities: [iv] + [v]	7.10	6.50	5.20
Estimated Sales: [vi]	12.30	11.50	10.00
EBIT: [vii]	1.23	1.15	1.00
[a] Net working capital position: [i] - [iv]	2.16	1.56	0.26
[b] Rate of return: [vii] /[iii]	17.32%	17.69%	19.23%
[c] Current ratio: [i]/ [iv]	1.92	1.67	1.11

[ii] Statement Showing Effect of Alternative Financing Policy

[₹ in crore]

Financing Policy	Conservative	Moderate	Aggressive
Current Assets [i]	3.90	3.90	3.90

Fixed Assets [ii]	2.60	2.60	2.60
Total Assets [iii]	6.50	6.50	6.50
Current Liabilities [iv]	2.34	2.34	2.34
Short term Debt [v]	0.54	1.00	1.50
Total current liabilities	2.88	3.34	3.84
[vi] = [iv] + [v]			
Long term Debt [vii]	1.12	0.66	0.16
Equity Capital [viii]	2.50	2.50	2.50
Total liabilities [ix] = [vi]+[vii]+[viii]	6.50	6.50	6.50
Forecasted Sales	11.50	11.50	11.50
EBIT [x]	1.15	1.15	1.15
Less: Interest on short-term debt	0.06 [12% of ₹ 0.54]	0.12 [12% of ₹ 1]	0.18 [12% of ₹ 1.5]
Interest on long term debt	0.18 [16% of ₹ 1.12]	0.11 [16% of ₹ 0.66]	0.03 [16% of ₹ 0.16]
Earnings before tax [EBT] [xi]	0.91	0.92	0.94
Taxes @ 35% [xii]	0.32	0.32	0.33
Earnings after tax: [xiii] = [xi] – [xii]	0.59	0.60	0.61
[a] Net Working Capital Position: [i] - [[iv] + [v]]	1.02	0.56	0.06
[b] Rate of return on shareholders Equity capital : [xiii]/ [viii]	23.6%	24.0%	24.4%
[c] Current Ratio [i] / [vi]	1.35	1.17	1.02

29.

Statement showing Estimate of Working Capital Needs

	[Amount in ₹]	**[Amount in ₹]**
A. Current Assets		
i] Inventories:		
Raw material [1 month or 4 weeks] $\left(\frac{1,30,000\text{units}\times\text{Rs.}100}{52\text{weeks}}\times 4\text{weeks}\right)$	10,00,000	
WIP Inventory [1 week]		

$\left(\frac{1,30,000\text{units}\times\text{Rs.}212.50}{52\text{weeks}}\times 1\text{week}\right)\times 0.8$	4,25,000	
Finished goods inventory [2 weeks] $\left(\frac{1,30,000\text{units}\times\text{Rs.}212.50}{52\text{weeks}}\times 2\text{weeks}\right)$	10,62,500	24,87,500
ii] Receivables [Debtors] [4 weeks] $\left(\frac{1,30,000\text{units}\times\text{Rs.}100}{52\text{weeks}}\times 4\text{weeks}\right)\times\frac{4}{5_{th}}$		17,00,000
iii] Cash and bank balance		37,500
Total Current Assets		42,25,000
B. Current Liabilities:		
i] Payables [Creditors] for materials [3 weeks] $\left(\frac{1,30,000\text{units}\times\text{Rs.}100}{52\text{weeks}}\times 3\text{weeks}\right)$		7,50,000
ii] Outstanding wages [1 week] $\left(\frac{1,30,000\text{units}\times\text{Rs.}37.50}{52\text{weeks}}\times 1\text{week}\right)$		93,750
iii] Outstanding overheads [2 weeks] $\left(\frac{1,30,000\text{units}\times\text{Rs.}75}{52\text{weeks}}\times 2\text{weeks}\right)$		3,75,000
Total Current Liabilities		12,18,750
Net Working Capital Needs [A – B]		30,06,250

CHAPTER 8: FM THEORY

Q1. Write short notes on Bridge Finance and Clean Packing Credit. [Dec 21]

ANSWER

Bridge Finance: Bridge finance 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. Though it is of short-term nature but since it is an important step in the facilitation of long-term loan, therefore it is being discussed along with the long term sources of funds. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short term loans from commercial banks. The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

Clean packing credit: This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods. It is a clean type of export advance. Each proposal is weighed according to particular requirements of the trade and credit worthiness of the exporter. A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation [ECGC] cover should be obtained by the bank

Q2. Distinguish between Scenario Analysis & Sensitivity Analysis. [Dec 21]

ANSWER

Scenario Analysis Vs Sensitivity Analysis

Sensitivity analysis calculates the impact of the change of a single input variable on the outcome of the project viz., NPV or IRR. The sensitivity analysis thus enables to identify that single critical variable which can impact the outcome in a huge way and the range of outcomes of the project given the change in the input variable.

Scenario analysis, on the other hand, is based on a scenario. The scenario may be recession or a boom wherein depending on the scenario, all input variables change. Scenario Analysis calculates the outcome of the project considering this scenario where the variables have changed simultaneously. Similarly, the outcome of the project would also be considered for the normal and recessionary situation. The variability in the outcome under the three different scenarios would help the management to assess the risk a project carries. Higher deviation in the outcome can be assessed as higher risk and lower to medium deviation can be assessed accordingly.

Scenario analysis is far more complex than sensitivity analysis because in scenario analysis all inputs

are changed simultaneously, considering the situation in hand while in sensitivity analysis, only one input is changed, and others are kept constant.

Q3. Explain in brief the phases of the evolution of financial management. [Dec 21]

ANSWER

Evolution of Financial Management: Financial management evolved gradually over the past 50 years. The evolution of financial management is divided into three phases. Financial Management evolved as a separate field of study at the beginning of the century.

The three stages of its evolution are:

The Traditional Phase: During this phase, financial management was considered necessary only during occasional events such as takeovers, mergers, expansion, liquidation, etc. Also, when taking financial decisions in the organisation, the needs of outsiders [investment bankers, people who lend money to the business and other such people] to the business was kept in mind.

The Transitional Phase: During this phase, the day-to-day problems that financial managers faced were given importance. The general problems related to funds analysis, planning and control were given more attention in this phase.

The Modern Phase: Modern phase is still going on. The scope of financial management has greatly increased now. It is important to carry out financial analysis for a company. This analysis helps in decision making. During this phase, many theories have been developed regarding efficient markets, capital budgeting, option pricing, valuation models and also in several other important fields in financial management. Here, financial management is viewed as a supportive and facilitative function, not only for top management but for all levels of management.

Q4. Adjustment of risk is required in capital budgeting decision, give reasons for it. [Dec 21]

ANSWER

Reasons for adjustment of Risk in Capital Budgeting decisions are as follows:

1. There is an opportunity cost involved while investing in a project for the level of risk. Adjustment of risk is necessary to help make the decision as to whether the returns out of the project are proportionate with the risks borne and whether it is worth investing in the project over the other investment options available.
2. Risk adjustment is required to know the real value of cash Inflows. Higher risk will lead to higher risk premium and also the expectation of higher return.

Q5. State four tasks involved to demonstrate the importance of good Financial Management. [Jan 21]

ANSWER

The best way to demonstrate the importance of good financial management is to describe some of the tasks that it involves:

- Taking care not to over-invest in fixed assets
- Balancing cash-outflow with cash-inflows
- Ensuring that there is a sufficient level of short-term working capital
- Setting sales revenue targets that will deliver growth
- Increasing gross profit by setting the correct pricing for products or services
- Controlling the level of general and administrative expenses by finding more cost- efficient ways of running the day-to-day business operations, and
- Tax planning that will minimize the taxes a business has to pay.

Q6. Explain Electronic Cash Management System. [Jan 21]

ANSWER

Electronic Cash Management System: Most of the cash management systems now-a- days are electronically based, since 'speed' is the essence of any cash management system. Electronically, transfer of data as well as funds play a key role in any cash management system. Various elements in the process of cash management are linked through a satellite. Various places that are interlinked may be the place where the instrument is collected, the place where cash is to be transferred in company's account, the place where the payment is to be transferred etc.

Q7. Define Internal Rate of Return [IRR] [Jan 21]

ANSWER

Internal rate of return: Internal rate of return for an investment proposal is the discount rate that equates the present value of the expected cash inflows with the initial cash outflow.

Q8. Explain in brief the following bonds: [Jan 21]

i. Callable Bonds

ii. Puttable Bonds

ANSWER

Callable bonds: A callable bond has a call option which gives the issuer the right to redeem the bond before maturity at a predetermined price known as the call price [Generally at a premium].

Puttable bonds: Puttable bonds give the investor a put option [i.e. the right to sell the bond] back to the company before maturity.

Q9. Explain in brief the forms of Post Shipment Finance [July 21]

ANSWER

Post-shipment Finance: It takes the following forms:

i. **Purchase/discounting of documentary export bills:** Finance is provided to exporters by purchasing export bills drawn payable at sight or by discounting usance export bills covering confirmed sales and backed by documents including documents of the title of goods such as bill of lading, post parcel receipts, or air consignment notes.
ii. **E.C.G.C. Guarantee:** Post-shipment finance, given to an exporter by a bank through purchase, negotiation or discount of an export bill against an order, qualifies for post- shipment export credit guarantee. It is necessary, however, that exporters should obtain a shipment or contracts risk policy of E.C.G.C. Banks insist on the exporters to take a contracts shipments [comprehensive risks] policy covering both political and commercial risks. The Corporation, on acceptance of the policy, will fix credit limits for individual exporters and the Corporation's liability will be limited to the extent of the limit so fixed for the exporter concerned irrespective of the amount of the policy.
iii. **Advance against export bills sent for collection:** Finance is provided by banks to exporters by way of advance against export bills forwarded through them for collection, taking into account the creditworthiness of the party, nature of goods exported, usance, standing of drawee, etc.
iv. **Advance against duty draw backs, cash subsidy, etc.**: To finance export losses sustained by exporters, bank advance against duty draw-back, cash subsidy, etc., receivable by them against export performance. Such advances are of clean nature; hence necessary precaution should be exercised.

Q10. Describe the salient features of FORFAITING. [July 21]

ANSWER

The Salient features of forfaiting are:

i. It motivates exporters to explore new geographies as payment is assured.
ii. An overseas buyer [importer] can import goods and services on deferred payment terms.
iii. The exporter enjoys reduced transaction costs and complexities of international trade transactions.
iv. The exporter gets to compete in the international market and can continue to put his working capital to good use to scale up operations.
v. While importers avail of forfaiting facility from international financial institutions in order to finance their imports at competitive rates.

Q11. List out the steps to be followed by the manager to measure and maximize the Shareholder's Wealth [July 21]

ANSWER

For measuring and maximising shareholders' wealth, manager should follow:

i. Cash Flow approach not Accounting Profit

ii. Cost benefit analysis

iii. Application of time value of money.

Q12. Explain the limitations of Average Rate of Return. [July 21]

ANSWER

Limitations of Average Rate of Return

i. The accounting rate of return technique, like the payback period technique, ignores the time value of money and considers the value of all cash flows to be equal.

ii. The technique uses accounting numbers that are dependent on the organization's choice of accounting procedures, and different accounting procedures, e.g., depreciation methods, can lead to substantially different amounts for an investment's net income and book values.

iii. The method uses net income rather than cash flows; while net income is a useful measure of profitability, the net cash flow is a better measure of an investment's performance.

iv. Furthermore, inclusion of only the book value of the invested asset ignores the fact that a project can require commitments of working capital and other outlays that are not included in the book value of the project.

Q13. Explain the steps of Sensitivity Analysis. [May 2019]

ANSWER

Steps involved in Sensitivity Analysis

Sensitivity Analysis is conducted by following the steps as below:

i. Finding variables, which have an influence on the NPV [or IRR] of the project

ii. Establishing mathematical relationship between the variables.

iii. Analysis the effect of the change in each of the variables on the NPV [or IRR] of the project.

Q14. What is the process of Debt Securitisation ? [May 2019]

ANSWER

Process of Debt Securitisation

(i) The origination function – A borrower seeks a loan from a finance company, bank, HDFC. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.

(ii) The pooling function – Similar loans on receivables are clubbed together to create an underlying

pool of assets. The pool is transferred in favour of Special purpose Vehicle [SPV], which acts as a trustee for investors.

(iii) The securitisation function – SPV will structure and issue securities on the basis of asset pool. The securities carry a coupon and expected maturity which can be asset based/ mortgage based. These are generally sold to investors through merchant bankers. Investors are – pension funds, mutual funds, insurance funds. The process of securitization is generally without recourse i.e. investors bear the credit risk and issuer is under an obligation to pay to investors only if the cash flows are received by him from the collateral. The benefits to the originator are that assets are shifted off the balance sheet, thus giving the originator recourse to off-balance sheet funding.

Q15. Explain any two steps involved in Decision tree Analysis. [May 2019]

ANSWER

Steps involved in Decision Tree analysis:

Step 1- **Define Investment**: Decision three analysis can be applied to a variety of business decision-making scenarios.

Step 2- **Identification of Decision Alternatives:** It is very essential to clearly identity decision alternatives. For example, if a company is planning to introduce a new product, it may be local launch, national launch or international launch.

Step 3- **Drawing a Decision Tree:** After identifying decision alternatives, at the relevant data such as the projected cash flows, probability distribution expected present value etc. should be put in diagrammatic form called decision tree.

Step 4- **Evaluating the Alternatives:** After drawing out the decision the next step is the evaluation of alternatives.

Q16. Give any two limitations of leasing. [May 2019 : May 2022]

ANSWER

Limitations of Leasing

(1) The lease rentals become payable soon after the acquisition of assets and no moratorium period is permissible as in case of term loans from financial institutions. The lease arrangement may, therefore, not be suitable for setting up of the new projects as it would entail cash outflows even before the project comes into operation.

(2) The leased assets are purchased by the lessor who is the owner of equipment. The seller's warranties for satisfactory operation of the leased assets may sometimes not be available to lessee.

(3) Lessor generally obtains credit facilities from banks etc. to purchase the leased equipment which are subject to hypothecation charge in favour of the bank. Default in payment by the lessor may sometimes result in seizure of assets by banks causing loss to the lessee.

(4) Lease financing has a very high cost of interest as compared to interest charged on term loans by financial institutions/banks.

Q17. Briefly explain the assumptions of Walter's Model. [May 2022]

ANSWER

Assumptions of Walter's Model

i. All investment proposals of the firm are to be financed through retained earnings only.

ii. 'r' rate of return & 'Ke' cost of capital are constant.

iii. Perfect capital markets: The firm operates in a market in which all investors are rational and information is freely available to all.

iv. No taxes or no tax discrimination between dividend income and capital appreciation [capital gain]. It means there is no difference in taxation of dividend

v. income or capital gain. This assumption is necessary for the universal applicability of the theory, since, the tax rates may be different in different countries.

vi. No floatation or transaction cost: Similarly, these costs may differ country to country or market to market.

vii. The firm has perpetual life.

Q18. State advantages of "Wealth Maximization" goals in Financial Management[May 2022]

ANSWER

Advantages of "Wealth Maximization" goals in Financial Management

- Emphasizes the long-term gains.
- Recognizes risk or uncertainty.
- Recognizes the timing of returns.
- Considers shareholders' return.

Q19. Distinguish between American Depository Receipts and Global Depository Receipts. [May 2022]

ANSWER

American Depository Receipts [ADRs]: These are securities offered by non-US companies who want to list on any of the US exchange. Each ADR represents a certain number of a company's regular shares. ADRs allow US investors to buy shares of these companies without the costs of investing directly in a foreign stock exchange.

Global Depository Receipts [GDRs]: These are negotiable certificates held in the bank of one country representing a specific number of shares of a stock traded on the exchange of another country. These

financial instruments are used by companies to raise capital in either dollars or Euros. These are mainly traded in European countries and particularly in London.

Q20. List out the conditions, framed by SEBI, which a company needs to fulfil in order to issue of bonus shares. [May 2023]

ANSWER

To issue Bonus shares, a Company needs to fulfill all the conditions given by Securities Exchange Board of India [SEBI]:

i. As per SEBI, the bonus shares are issued not in lieu of cash dividends.

ii. A bonus issue should be authorized by Article of Association [AOA] and not to be declared unless all partly paid-up shares have been converted into fully paid-up shares.

iii. The Company should not have defaulted on re-payment of loan, interest, and any statutory dues.

iv. Bonus shares are to be issued only from share premium and free reserves and not from capital reserve on account of fixed assets revaluation.

Q21. "Permanent working capital and fluctuating [temporary] working capital, both are necessary to facilitate production and sales through the operating cycle." - Describe. [May 2023]

ANSWER

Both kinds of working capital i.e. permanent and fluctuating [temporary] are necessary to facilitate production and sales through the operating cycle: Permanent working capital refers to the base working capital, which is the minimum level of investment in the current assets that is carried by the entity at all times to carry its day to day activities. It generally stays invested in the business unless the operations are scaled up or down permanently which would also result in increase or decrease in permanent working capital. It is generally financed by long term sources of finance.

Temporary working capital refers to that part of total working capital, which is required by an entity in addition to the permanent working capital. It is also called variable or fluctuating working capital which is used to finance the short-term working capital requirements which arises due to fluctuation in sales volume. For instance, an organization would maintain increased levels of inventory to meet increased seasonal demand

Q22. Briefly explain concept of "Trading on Equity" in financial leverage analysis. [May 2023]

ANSWER

Financial Leverage as 'Trading on Equity':

Financial leverage indicates the use of funds with fixed cost like long term debts and preference share capital along with equity share capital which is known as trading on equity. The basic aim of financial leverage is to increase the earnings available to equity shareholders using fixed cost fund. A firm is known to have a positive/favourable leverage when its earnings are more than the cost of

debt. If earnings are equal to or less than cost of debt, it will be a negative/unfavourable leverage. When the quantity of fixed cost fund is relatively high in comparison to equity capital it is said that the firm is 'trading on equity".

Q23. Discuss features of Secured Premium Notes. [May 2023]

ANSWER

Features of Secured Premium Notes:

- SPN instruments are issued with a detachable warrant.
- These instruments are redeemable after a notified period of say 4 to 7 years.
- No interest is paid during the lock in period.
- The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

Q24. Explain in brief following Financial Instruments: [Nov 2018]

(i) Euro Bonds

(ii) Floating Rate Notes

(iii) Euro Commercial paper

(iv) Fully Hedged Bond

ANSWER

(i) Euro bonds: Euro bonds are debt instruments which are not denominated in the currency of the country in which they are issued. E.g. a Yen note floated in Germany.

(ii) Floating Rate Notes: Floating Rate Notes: are issued up to seven years maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than foreign loans.

(iii) Euro Commercial Paper[ECP]: ECPs are short term money market instruments. They are for maturities less than one year. They are usually designated in US Dollars.

(iv) Fully Hedged Bond: In foreign bonds, the risk of currency fluctuations exists. Fully hedged bonds eliminate the risk by selling in forward markets the entire stream of principal and interest payments.

Q25. Discuss the Advantages of Leasing. [Nov 2018]

ANSWER

i. Lease may low cost alternative: Leasing is alternative to purchasing. As the lessee is to make a series of payments for using an asset, a lease arrangement is similar to a debt contract. The benefit of lease is based on a comparison between leasing and buying an asset. Many lessees find lease more attractive because of low cost.

ii. **Tax benefit:** In certain cases tax benefit of depreciation available for owning an asset may be less than that available for lease payment

iii. **Working capital conservation:** When a firm buy an equipment by borrowing from a bank [or financial institution], they never provide 100% financing. But in case of lease one gets normally 100% financing. This enables conservation of working capital.

iv. **Preservation of Debt Capacity:** So, operating lease does not matter in computing debt equity ratio. This enables the lessee to go for debt financing more easily. The access to and ability of a firm to get debt financing is called debt capacity [also, reserve debt capacity].

v. **Obsolescence and Disposal:** After purchase of leased asset there may be technological obsolescence of the asset. That means a technologically upgraded asset with better capacity may come into existence after purchase. To retain competitive advantage the lessee as user may have to go for the upgraded asset.

Q26. Write two main objectives of Financial Management[Nov 2018]

ANSWER

Profit Maximisation

It has traditionally been argued that the primary objective of a company is to earn profit; hence the objective of financial management is also profit maximisation.

Wealth / Value Maximization

Wealth / Value Maximization Model. Shareholders wealth are the result of cost benefit analysis adjusted with their timing and risk i.e. time value of money. This is the real objective of Financial Management. So,

Wealth = Present Value of benefits – Present Value of Costs

Q27. Write two main reasons for considering risk in Capital Budgeting decisions . [Nov 2018]

ANSWER

Main reasons for considering risk in capital budgeting decisions are as follows

i. There is an opportunity cost involved while investing in a project for the level of risk. Adjustment of risk is necessary to help make the decision as to whether the returns out of the project are proportionate with the risks borne and whether it is worth investing in the project over the other investment options available.

ii. Risk adjustment is required to know the real value of the Cash Inflows.

Q28. Briefly explain the three finance function decisions. [Nov 2019]

ANSWER

The finance functions are divided into long term and short term functions/ decisions:

Long term Finance Function Decisions

(i) **Investment decisions [I]:** These decisions relate to the selection of assets in which funds will be

invested by a firm. Funds procured from different sources have to be invested in various kinds of assets. Long term funds are used in a project for various fixed assets and also for current assets.

(ii) **Financing decisions [F]:** These decisions relate to acquiring the optimum finance to meet financial objectives and seeing that fixed and working capital are effectively managed. The financial manager needs to possess a good knowledge of the sources of available funds and their respective costs and needs to ensure that the company has a sound capital structure, i.e. a proper balance between equity capital and debt.

(iii) **Dividend decisions [D]:** These decisions relate to the determination as to how much and how frequently cash can be paid out of the profits of an organization as income for its owners/shareholders. The owner of any profit-making organization looks for reward for his investment in two ways, the growth of the capital invested and the cash paid out as income; for a sole trader this income would be termed as drawings and for a limited liability company the term is dividends.

Short- term Finance Decisions/Function

Working capital Management [WCM]: Generally short term decision is reduced to management of current asset and current liability [i.e., working capital Management].

Q29. Explain the steps while using the equivalent annualized criterion. [Nov 2019]

ANSWER

Equivalent Annualized Criterion: This method involves the following steps-

i. Compute NPV using the WACC or discounting rate.

ii. Compute Present Value Annuity Factor [PVAF] of discounting factor used above for the period of each project.

iii. Divide NPV computed under step [i] by PVAF as computed under step [ii] and compare the values.

Q30. Explain the significance of Cost of Capital. [Nov 2019]

ANSWER

i. **Significance of the Cost of Capital:** The cost of capital is important to arrive at correct amount and helps the management or an investor to take an appropriate decision. The correct cost of capital helps in the following decision making:

ii. **Evaluation of investment options:** The estimated benefits [future cashflows] from available investment opportunities [business or project] are converted into the present value of benefits by discounting them with the relevant cost of capital. Here it is pertinent to mention that every investment option may have different cost of capital hence it is very important to use the cost of capital which is relevant to the options available. Here Internal Rate of Return [IRR] is treated as cost of capital for evaluation of two options [projects].

iii. **Performance Appraisal:** Cost of capital is used to appraise the performance of a particulars project or business. The performance of a project or business in compared against the cost of capital which is known here as cut-off rate or hurdle rate.

iv. **Designing of optimum credit policy:** While appraising the credit period to be allowed to the customers, the cost of allowing credit period is compared against the benefit/ profit earned by providing credit to customer of segment of customers. Here cost of capital is used to arrive at the present value of cost and benefits received.

Q31. Briefly describe any four sources of short-term finance. [Nov 2019]

ANSWER

Sources of Short Term Finance: There are various sources available to meet short- term needs of finance. The different sources are discussed below-

(i) Trade Credit: It represents credit granted by suppliers of goods, etc., as an incident of sale. The usual duration of such credit is 15 to 90 days. It generates automatically in the course of business and is common to almost all business operations. It can be in the form of an 'open account' or 'bills payable'.

Accrued Expenses and Deferred Income: Accrued expenses represent liabilities which a company has to pay for the services which it has already received like wages, taxes, interest and dividends. Such expenses arise out of the day-to-day activities of the company and hence represent a spontaneous source of finance.

Deferred Income: These are the amounts received by a company in lieu of goods and services to be provided in the future. Since these receipts increases a company's liquidity, they are also considered to be an important sources of short- term finance.

(ii) Advances from Customers: Manufacturers and contractors engaged in producing or constructing costly goods involving considerable length of manufacturing or construction time usually demand advance money from their customers at the time of accepting their orders for executing their contracts or supplying the goods. This is a cost free source of finance and really useful.

(iii) Commercial Paper: A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note. The Reserve Bank of India introduced the commercial paper scheme in the year 1989 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors.

(iv) Treasury Bills: Treasury bills are a class of Central Government Securities. Treasury bills, commonly referred to as T-Bills are issued by Government of India to meet short term borrowing requirements with maturities ranging between 14 to 364 days.

(v) Certificates of Deposit [CD]: A certificate of deposit [CD] is basically a savings certificate with a fixed maturity date of not less than 15 days up to a maximum of one year.

(vi) Bank Advances: Banks receive deposits from public for different periods at varying rates of interest. These funds are invested and lent in such a manner that when required, they may be called back. Lending results in gross revenues out of which costs, such as interest on deposits, administrative costs, etc., are met and a reasonable profit is made. A bank's lending policy is not merely profit motivated but has to also keep in mind the socio- economic development of the country. Some of the facilities provided by banks are Short Term Loans, Overdraft, Cash Credits, Advances against goods, Bills Purchased/Discounted.

(vii) Financing of Export Trade by Banks: Exports play an important role in accelerating the economic growth of developing countries like India. Of the several factors influencing export growth, credit is a very important factor which enables exporters in efficiently executing their export orders. The commercial banks provide short-term export finance mainly by way of pre and post-shipment credit. Export finance is granted in Rupees as well as in foreign currency.

(viii) Inter Corporate Deposits: The companies can borrow funds for a short period say 6 months from other companies which have surplus liquidity. The rate of interest on inter corporate deposits varies depending upon the amount involved and time period.

(ix) Certificate of Deposit [CD]: The certificate of deposit is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds. The main advantage of CD is that banker is not required to encash the deposit before maturity period and the investor is assured of liquidity because he can sell the CD in secondary market.

(x) Public Deposits: Public deposits are very important source of short-term and medium term finances particularly due to credit squeeze by the Reserve Bank of India. A company can accept public deposits subject to the stipulations of Reserve Bank of India from time to time maximum up to 35 per cent of its paid up capital and reserves, from the public and shareholders. These deposits may be accepted for a period of six months to three years. Public deposits are unsecured loans; they should not be used for acquiring fixed assets since they are to be repaid within a period of 3 years. These are mainly used to finance working capital requirements.

Q32. List out the role of Chief Financial Officer in today's World. [Nov 2020]

ANSWER

Role of Chief Financial Officer [CFO] in Today's World: Today, the role of chief financial officer, or CFO, is no longer confined to accounting, financial reporting and risk management. It's about being a strategic business partner of the chief executive officer, or CEO. Some of the role of a CFO in today's world are as follows-

i. Budgeting

ii. Forecasting

iii. Managing M&As

iv. Profitability analysis [for example, by customer or product]

v. Pricing analysis

vi. Decisions about outsourcing

vii. Overseeing the IT function.

viii. Overseeing the HR function.

ix. Strategic planning [sometimes overseeing this function].

x. Regulatory compliance.

xi. Risk management

Q33. Explain in brief the methods of Venture Capital Financing. [Nov 2020]

ANSWER

Methods of Venture Capital Financing: Some common methods of venture capital financing are as follows-

i. Equity financing: The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.

ii. Conditional loan: A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest [which could be well above 20 per cent] instead of royalty on sales once it becomes commercially sound.

iii. Income note: It is a hybrid security which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for commercial application of indigenous technology.

iv. Participating debenture: Such security carries charges in three phases — in the start-up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.

Q34. Distinguish between Unsystematic Risk & Systematic Risk. [Nov 2020]

ANSWER

[i] **Unsystematic Risk:** This is also called company specific risk as the risk is related with the company's performance. This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk.

[ii] **Systematic Risk:** It is the macro-economic or market specific risk under which a company operates. This type of risk cannot be eliminated by the diversification hence, it is non-diversifiable. The examples are inflation, Government policy, interest rate etc.

Q35. These bonds are issued by non-US Banks and non-US corporations in US. What this bond is called and what are the other features of this Bond? [Nov 2022]

ANSWER

The Bond is called as **Yankee Bond.**

Features of the bond:

i. These bonds are denominated in Dollars

ii. Bonds are to be registered in SEC [Securities and Exchange Commission]

iii. Bonds are issued in tranches

iv. Time taken can be up to 14 weeks

Q36. Elucidate the fundamental tasks of treasury department of a firm. [Nov 2022]

ANSWER

Fundamental tasks of treasury department of a firm:

i. **Cash management:** It involves efficient cash collection process and managing payment of cash both inside the organization and to third parties. Treasury will also manage surplus funds in an investment portfolio.

ii. **Currency management:** The treasury department manages the foreign currency risk exposure of the company. In a large multi-national company, the first step will usually be to set off intra-group indebtedness. The use of matching receipts and payments in the same currency will save transaction costs and will save the organization from any unfavorable exchange movement.

iii. **Fund management:** Treasury department is responsible for planning and sourcing the company's short, medium and long-term cash needs. It also facilitates temporary investment of surplus funds by mapping the time gap between funds inflow and outflow.

iv. **Banking:** It is important that a company maintains a good relationship with its bankers. Treasury department carry out negotiations with bankers with respect to
interest rates, foreign exchange rates etc. and act as the initial point of contact with them.

v. **Corporate finance:** Treasury department is involved with both acquisition and divestment activities within the group. In addition, it will often have responsibility for investors' relations.

Q37. The firm has more capital than its requirements. What is this situation called? Give two consequences of it. [Nov 2022]

ANSWER

The situation is called as Over Capitalization. Consequences of Over Capitalization:

i. Considerable reduction in the rate of dividend and interest payments.

ii. Reduction in the market price of shares

iii. Resorting to "Window dressing"

iv. Some companies may opt for reorganization. However, sometimes the matter gets worse and the company may go into liquidation.

Q38. What are the important factors considered for deciding the source and quantum of capital? [Nov 2022]

ANSWER

The source and quantum of capital is decided keeping in mind the following factors:

i. Control: Capital structure should be designed in such a manner that existing shareholders continue to hold majority stake

ii. Risk: Capital structure should be designed in such a manner that financial risk of a company does not increase beyond tolerable limit.

iii. Cost: Overall cost of capital remains minimum.

Q39. Write short notes on the following: [RTP May 2019]

Functions of Finance Manager.

ANSWER

The Finance Manager's main objective is to manage funds in such a way so as to ensure their optimum utilisation and their procurement in a manner that the risk, cost and control considerations are properly balanced in a given situation. To achieve these objectives the Finance Manager performs the following functions:

(i) Estimating the requirement of Funds: Both for long-term purposes i.e. investment in fixed assets and for short-term i.e. for working capital. Forecasting the requirements of funds involves the use of techniques of budgetary control and long-range planning.

(ii) Decision regarding Capital Structure: Once the requirement of funds has been estimated, a decision regarding various sources from which these funds would be raised has to be taken. A proper balance has to be made between the loan funds and own funds. He has to ensure that he raises sufficient long term funds to finance fixed assets and other long term investments and to provide for the needs of working capital.

(iii) Investment Decision: The investment of funds, in a project has to be made after careful assessment of various projects through capital budgeting. Assets management policies are to be laid down regarding various items of current assets. For e.g. receivable in coordination with sales manager, inventory in coordination with production manager.

(iv) Dividend decision: The finance manager is concerned with the decision as to how much to retain

and what portion to pay as dividend depending on the company's policy. Trend of earnings, trend of share market prices, requirement of funds for future growth, cash flow situation etc., are to be considered.

(v) Evaluating financial performance: A finance manager has to constantly review the financial performance of the various units of organisation generally in terms of ROI Such a review helps the management in seeing how the funds have been utilised in various divisions and what can be done to improve it.

(vi) Financial negotiation: The finance manager plays a very important role in carrying out negotiations with the financial institutions, banks and public depositors for raising of funds on favourable terms.

(vii) Cash management: The finance manager lays down the cash management and cash disbursement policies with a view to supply adequate funds to all units of organisation and to ensure that there is no excessive cash.

(viii) Keeping touch with stock exchange: Finance manager is required to analyse major trends in stock market and their impact on the price of the company share.

Q40. Write short notes on the following: [RTP May 2019]

Inter relationship between investment, financing and dividend decisions.

ANSWER

Inter-relationship between Investment, Financing and Dividend Decisions

The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. It is correct to say that these decisions are inter- related because the underlying objective of these three decisions is the same, i.e. maximisation of shareholders' wealth. Since investment, financing and dividend decisions are all interrelated, one has to consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions. This is possible by evaluating each decision in relation to its effect on the shareholders' wealth.

The above three decisions are briefly examined below in the light of their inter- relationship and to see how they can help in maximising the shareholders' wealth i.e. market price of the company's shares.

Investment decision: The investment of long term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is adequate to meet its cost of financing. This have an influence on the profitability of the company and ultimately on its

wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager has to maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he has to ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximise their wealth.

Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximises shareholders' wealth.

The above discussion makes it clear that investment, financing and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders' wealth.

Q41. Write short notes on the following: [RTP May 2019]

Debt securitization

ANSWER

Debt Securitisation: It is a method of recycling of funds. It is especially beneficial to financial intermediaries to support the lending volumes. Assets generating steady cash flows are packaged together and against this asset pool, market securities can be issued, e.g. housing finance, auto loans, and credit card receivables.

Process of Debt Securitisation

i. **The origination function** – A borrower seeks a loan from a finance company, bank. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.
ii. **The pooling function** – Similar loans on receivables are clubbed together to create an underlying pool of assets. The pool is transferred in favour of Special purpose Vehicle [SPV], which acts as a trustee for investors.
iii. **The securitization function** – SPV will structure and issue securities on the basis of asset pool. The securities carry a coupon and expected maturity which can be asset-based/mortgage based. These are generally sold to investors through merchant bankers. Investors are – pension funds, mutual funds, insurance funds.

Q42. "The profit maximization is not an operationally feasible criterion." IDENTIFY. [RTP May 2020]

ANSWER

The profit maximisation is not an operationally feasible criterion." This statement is true because profit maximisation can be a short-term objective for any organisation and cannot be its sole objective. Profit

maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:

(a) **Vague term**: The definition of the term profit is ambiguous. Does it mean short term or long term profit? Does it refer to profit before or after tax? Total profit or profit per share?

(b) **Timing of Return**: The profit maximization objective does not make distinction between returns received in different time periods. It gives no consideration to the time value of money, and values benefits received today and benefits received after a period as the It ignores the risk factor.

(c) The term **maximization is also vague.**

Q43. "Profit Maximization cannot be the sole objective of a company". COMMENT.

[RTP May 2021]

ANSWER

Following are the reasons due to which Profit Maximization cannot be the sole objective of a company:

i. The term profit is vague. It does not clarify what exactly it means. It conveys a different meaning to different people. For example, profit may be in short term or long-term period; it may be total profit or rate of profit etc.

ii. Profit maximisation has to be attempted with a realisation of risks involved. There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.

iii. Profit maximisation as an objective does not take into account the time pattern of returns. Proposal A may give a higher amount of profits as compared to proposal B, yet if the returns of proposal A begin to flow say 10 years later, proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick.

iv. Profit maximisation as an objective is too narrow. It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

Q44. DISCUSS the advantages and disadvantages of raising funds by issue of preference shares.

[RTP May 2021]

ANSWER

Advantages and disadvantages of raising funds by issue of preference shares

Advantages

(i) No dilution in EPS on enlarged capital base – On the other hand if equity shares are issued it reduces EPS, thus affecting the market perception about the company.

(ii) There is also the advantage of leverage as it bears a fixed charge [because companies are required to pay a fixed rate of dividend in case of issue of preference shares]. Non-payment of preference dividends does not force a company into liquidity.

(iii) There is no risk of takeover as the preference shareholders do not have voting rights except where dividend payment are in arrears.

(iv) The preference dividends are fixed and pre-decided. Hence preference shareholders cannot participate in surplus profits as the ordinary shareholders can except in case of participating preference shareholders.

(v) Preference capital can be redeemed after a specified period.

Disadvantages

(i) One of the major disadvantages of preference shares is that preference dividend is not tax deductible and so does not provide a tax shield to the company. Hence, preference shares are costlier to the company than debt e.g. debenture.

(ii) Preference dividends are cumulative in nature. This means that if in a particular year preference dividends are not paid they shall be accumulated and paid later. Also, if these dividends are not paid, no dividend can be paid to ordinary shareholders. The non-payment of dividend to ordinary shareholders could seriously impair the reputation of the concerned company.

Q45. DISCUSS Agency problem and its cost. HOW it arises and HOW it can be addressed? [RTP May 2022]

ANSWER

Agency Problem: Though in a sole proprietorship firm, partnership etc., owners participate in management but in corporates, owners are not active in management so, there is a separation between owner/ shareholders and managers. In theory managers should act in the best interest of shareholders however in reality, managers may try to maximise their individual goal like salary, perks etc., so there is a principal agent relationship between managers and owners, which is known as Agency Problem. In a nutshell, Agency Problem is the chances that managers may place personal goals ahead of the goal of owners.

Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behaviour so as to maximise shareholders wealth.

Generally, Agency Costs are of four types [i] monitoring [ii] bonding [iii] opportunity [iv] structuring.

The agency problem arises if manager's interests are not aligned to the interests of the debt lender and equity investors. The agency problem of debt lender would be addressed by imposing negative covenants i.e. the managers cannot borrow beyond a point. This is one of the most important concepts of modern-day finance and the application of this would be applied in the Credit Risk Management of Bank, Fund Raising, Valuing distressed companies.

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the shareholders. It is easier said than done.

However, following efforts have been made to address these issues:

- Managerial compensation is linked to profit of the company to some extent and also with the long-term objectives of the company.
- Employee is also designed to address the issue with the underlying assumption that maximization of the stock price is the objective of the investors.
- Effecting monitoring can be done.

Q46. HIGHLIGHT the similarities and differences between Samurai Bond and Bull Dog Bond. [RTP May 2023]

ANSWER

Samurai Bond	• Samurai bonds are denominated in Japanese Yen JPY • Issued in Tokyo • Issuer Non- Japanese Company • Regulations: Japanese • Purpose: Access of capital available in Japanese market • Issue proceeds can be used to fund Japanese operation • Issue proceeds can be used to fund a company's local opportunities. • It can also be used to hedge foreign exchange risk
Bulldog Bond	• It is denominated in Bulldog Pound Sterling/Great Britain Pound [GBP] • Issued in London • Issuer Non- UK Company • Regulations: Great Britain • Purpose: Access of capital available in UK market • Issue proceeds can be used to fund UK operation • Issue proceeds can be used to fund a company's local opportunities

Q47. STATE the meaning of Payback Reciprocal. [RTP Nov 2019]

ANSWER

As the name indicates it is the reciprocal of payback period. A major drawback of the payback period method of capital budgeting is that it does not indicate any cut off period for the purpose of investment decision. It is, however, argued that the reciprocal of the payback would be a close approximation of the Internal Rate of Return [later discussed in detail] if the life of the project is at least twice the payback period and the project generates equal amount of the annual cash inflows. In practice, the payback reciprocal is a helpful tool for quick estimation of rate of return of a project provided its life is at least twice the payback period.

The payback reciprocal can be calculated as follows:

Pay back Reciprocal = Average annual cash in flow ÷ Initial investment

Q48. STATE the functions of treasury department. [RTP Nov 2019]

ANSWER

Cash Management: It involves efficient cash collection process and managing payment of cash both inside the organisation and to third parties.

There may be complete centralization within a group treasury or the treasury may simply advise subsidiaries and divisions on policy matter viz., collection/payment periods, discounts, etc.

Treasury will also manage surplus funds in an investment portfolio. Investment policy will consider future needs for liquid funds and acceptable levels of risk as determined by company policy.

Currency Management: The treasury department manages the foreign currency risk exposure of the company. In a large multinational company [MNC] the first step will usually be to set off intra-group indebtedness. The use of matching receipts and payments in the same currency will save transaction costs. Treasury might advise on the currency to be used when invoicing overseas sales. The treasury will manage any net exchange exposures in accordance with company policy. If risks are to be minimized then forward contracts can be used either to buy or sell currency forward.

Fund Management: Treasury department is responsible for planning and sourcing the company's short, medium and long-term cash needs. Treasury department will also participate in the decision on capital structure and forecast future interest and foreign currency rates.

Banking: It is important that a company maintains a good relationship with its bankers. Treasury department carry out negotiations with bankers and act as the initial point of contact with them. Short-term finance can come in the form of bank loans or through the sale of commercial paper in the money market.

Corporate Finance: Treasury department is involved with both acquisition and divestment activities within the group. In addition, it will often have responsibility for investor relations. The latter activity has assumed increased importance in markets where share-price performance is regarded as crucial and may affect the company's ability to undertake acquisition activity or, if the price falls drastically, render it vulnerable to a hostile bid.

Q49. DESCRIBE the Inter relationship between investment, financing and dividend decisions. [RTP Nov 2019]

ANSWER

Inter-relationship between Investment, Financing and Dividend Decisions: The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. It is correct to say that these decisions are inter-related because the underlying objective of these three decisions is the same, i.e. maximisation of shareholders' wealth. Since investment, financing and dividend decisions are all interrelated, one has to consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions. This is possible by evaluating each decision in relation to its effect on the shareholders' wealth.

The above three decisions are briefly examined below in the light of their inter- relationship and to see how they can help in maximising the shareholders' wealth i.e. market price of the company's shares.

Investment decision: The investment of long term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is adequate to meet its cost of financing. This have an influence on the profitability of the company and ultimately on its wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager has to maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he has to ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximise their wealth.

Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximises shareholders' wealth.

The above discussion makes it clear that investment, financing and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders' wealth

Q50. EXPLAIN agency problem and agency cost. How to address the issues of the same. [RTP Nov 2020]

ANSWER

Though in a sole proprietorship firm, partnership etc., owners participate in management but in corporates, owners are not active in management so, there is a separation between owner/

shareholders and managers. In theory managers should act in the best interest of shareholders, however, in reality, managers may try to maximise their individual goal like salary, perks etc., so there is a principal agent relationship between managers and owners, which is known as Agency Problem. In a nutshell, Agency Problem is the chances that managers may place personal goals ahead of the goal of owners. Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behaviour so as to maximise shareholders wealth. Generally, Agency Costs are of four types [i] monitoring [ii] bonding [iii] opportunity [iv] structuring

Addressing the agency problem

The agency problem arises if manager's interests are not aligned to the interests of the debt lender and equity investors. The agency problem of debt lender would be addressed by imposing negative covenants i.e. the managers cannot borrow beyond a point. This is one of the most important concepts of modern day finance and the application of this would be applied in the Credit Risk Management of Bank, Fund Raising, Valuing distressed companies.

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the shareholders. It is easier said than done.

However, following efforts have been made to address these issues:

- Managerial compensation is linked to profit of the company to some extent and also with the long term objectives of the company.
- Employee is also designed to address the issue with the underlying assumption that maximisation of the stock price is the objective of the investors.
- Effecting monitoring can be done.

Q51. COMPARE between Financial Lease and Operating Lease. [RTP Nov 2020]

ANSWER

Finance Lease	Operating Lease
The risk and reward incident to ownership are passed on to the lessee. The lessor only remains the legal owner of the asset.	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor.
The lessee obsolescence bears the risk of	The lessor bears the risk of obsolescence.
The lessor is interested in his rentals and not in the asset. He must get his principal back along with interest. Therefore, the lease is non-cancellable by either party.	As the lessor does not have difficulty in leasing the same asset to other willing lessor, the lease is kept cancelable by the lessor.

The lessor enters into the transaction only as financier. He does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears cost of repairs, maintenance or operations.
The lease is usually full payout, that is, the single lease repays the cost of the asset together with the interest.	The lease is usually non-payout, since the lessor expects to lease the same asset over and over again to several users.

Q52. DISCUSS the points that demonstrates the Importance of good financial management. [RTP Nov 2021]

ANSWER

Points that demonstrate the **"Importance of good financial management":**

- Taking care not to over-invest in fixed assets
- Balancing cash-outflow with cash-inflows
- Ensuring that there is a sufficient level of short-term working capital
- Setting sales revenue targets that will deliver growth
- Increasing gross profit by setting the correct pricing for products or services
- Controlling the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and
- Tax planning that will minimize the taxes a business has to pay.

Q53. EXPLAIN some common methods of Venture capital financing. [RTP Nov 2023]

ANSWER

Some common methods of venture capital financing are as follows:

(i) Equity financing: The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.

(ii) Conditional loan: A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest [which could be well above 20 per cent] instead of royalty on sales once it becomes commercially sound.

(iii) Income note: It is a hybrid security which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for

commercial application of indigenous technology.

(iv) **Participating debenture:** Such security carries charges in three phases — in the start-up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.