Q.1

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

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

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

Ans.

Balance Sheet of Rudra Ltd.

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

Working Notes:

Let sales be ₹ x

Balance Sheet of Rudra Ltd.

Liabilities	Amount (₹)	Assets	Amount (₹)
Capital		Fixed Assets	x/4
Reserves		Current Assets:	
Net Worth	x/4	Stock in Trade	x/6
Long Term Loan @ 10%	x/4	Debtors	x/6
		Cash	5,00,000
Current liabilities:			
Creditors	x/12		
Other Short-term Current Liability			
Outstanding Interest			
Total Current Liabilities	x/9+5,00,000/3		
Total		**Total**	

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

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

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

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

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

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

4. Debt: Equity = 1 : 1

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

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

5. Gross Profit to Cost = 20%

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

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

$GP = 0.2x - 0.2\,GP$

$1.2\,GP = 0.2x$

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

$GP = x/6$

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

6. COGS to creditors = 10:1

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

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

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

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

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

8. Current Ratio = 3 : 1

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

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

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

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

9. CA $= 3CL$

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

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

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

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

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

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

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

$= 1,20,00,000$

11. Now, from above calculations, we get,

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

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

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

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

Now, Capital to Reserve is 1 : 2

Capital = ₹ 10,00,000

and, Reserve = ₹ 20,00,000

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

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

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

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

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

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

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

Other STCL = 2,00,000

Q.2

Following information is given for X Ltd.:

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

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

Ans

(i) Operating Leverage (OL) = $\frac{\text{Contribution}}{\text{EBIT}}$ Or, 3.125 = $\frac{4,25,000}{\text{EBIT}}$

Or EBIT = ₹ 1,36,000

(ii) Degree of Combined Leverage (CL) = $\frac{\%\text{ Change in EPS}}{\%\text{ Change in Sales}}$ = $\frac{100}{40}$ = 2.5

(iii) Combined Leverage = OL × FL = 3.125 × FL

So, Financial Leverage = 2.5 /3.125 = 0.8

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

So, EBT = $\frac{1,36,000}{0.80}$ = ₹ 1,70,000

Calculation of EPS of X Ltd

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

Q.3

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

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

Required:

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

(ii) Does the company have a favourable financial leverage?

(iii) Calculate operating and combined leverages of the company.

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

(v) At what level of sales, the Earning before Tax (EBT) of the company will be equal to zero?

Ans.

Income Statement

Particulars	Amount (₹)
Sales	86,00,000
Less: Variable cost (65% of 86,00,000)	55,90,000
Contribution (35% of 86,00,000)	30,10,000

Less: Fixed costs	10,00,000
Earnings before interest and tax (EBIT)	20,10,000
Less: Interest on debt (@ 10% on ₹ 55 lakhs)	5,50,000
Earnings before tax (EBT)	14,60,000
Tax (40%)	5,84,000
PAT	8,76,000

(i) **ROCE (Pre-tax)** $= \frac{\text{EBIT}}{\text{Capital employed}} \times 100 = \frac{\text{EBIT}}{\text{Equity + Debt}} \times 100$

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

EPS (PAT/No. of equity shares) **1.168 or ₹ 1.17**

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

(iii) Calculation of Operating, Financial and Combined leverages:

Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{30,10,000}{20,10,000} =$ **1.497 (approx.)**

Financial Leverage $= \frac{\text{EBIT}}{\text{EBIT}} = \frac{20,10,000}{14,60,000} =$ 1.377 (approx.)

Combined Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{30,10,000}{14,60,000} =$ 2.062 (approx.)

Or, = Operating Leverage × Financial Leverage = 1.497 × 1.37 7 = **2.06 (approx.)**

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

(v) Since the combined Leverage is 2.062, sales have to drop by 100/2.062 i.e. 48.50% to bring EBT to Zero.
Accordingly, New Sales = ₹ 86,00,000 × (1 - 0.4850)
= ₹ 86,00,000 × 0.515
= ₹ 44,29,000 (approx.)
Hence, at ₹ 44,29,000 sales level, EBT of the firm will be equal to Zero.

Q.4

The following data is available for Stone Ltd. : (₹)

Sales	5,00,000
(-) Variable cost @ 40%	2,00,000
Contribution	3,00,000
(-) Fixed cost	2,00,000
EBIT	1,00,000
(-) Interest	25,000
Profit before tax	75,000

Using the concept of leverage, find out

(i) The percentage change in taxable income if EBIT increases by 10%.
(ii) The percentage change in EBIT if sales increases by 10%.
(iii) The percentage change in taxable income if sales increases by 10%.
Also verify the results in each of the above case.

Ans. (i) Degree of Financial Leverage = $\frac{EBIT}{EBT} = \frac{1,00,000}{75,000}$ = 1.333 times

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

Verification

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

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

So, percentage change in Taxable Income (EBT) = $\frac{1,00,000}{75,000}$ x 100 = 13.333%, hence verified

(ii) Degree of Operating Leverage = $\frac{Contribution}{EBIT} = \frac{3,00,000}{1,00,000}$ = 3 times

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

Verification

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

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

So, percentage change in EBIT = $\frac{30,000}{1,00,000}$ x 100 = 30%, hence verified.

(iii) Degree of Combined Leverage = $\frac{Contribution}{EBIT} = \frac{3,00,000}{75,000}$ = 4 times

So, if sale is increased by 10% then Taxable Income (EBT) will be increased by 4 × 10 = 40%

Verification

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

Increase in Earnings before tax (EBT) = ₹ 1,05,000 - ₹ 75,000 = ₹ 30,000

So, percentage change in Taxable Income (EBT) = $\frac{30,000}{75,000}$ x 100 = 40%, hence verified

Q.5

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

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

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

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

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

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

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

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

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

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

Ans. **Statement showing Profitability of Alternative Schemes for Financing**

(₹ in '00,000)

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

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

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (iii) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (ii). Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., ₹ 10.02 per share) will be also in option (iii).
So, if Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of ₹ 6.80 per share. In case of alternative (i), EPS is even lower than the existing option, hence not recommended.

Q.6

The following information pertains to CIZA Ltd.:

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

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

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

You are informed that Debt-equity ratio (Debt/ Shareholders' fund) in the range of 50% to 80% will bring down

the price-earnings ratio to 22 whereas; Debt-equity ratio over 80% will bring down the price-earnings ratio to 18.

Required:

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

Ans. **Working notes:**

(i) Interest Coverage ratio = 8

$$\frac{\text{EBIT}}{\text{Interest}} = 8$$

$$\frac{\text{EBIT}}{1,20,000} = 8$$

So, EBIT = ₹ 9,60,000

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

Option 1: Equity option

Debt = ₹ 10,00,000
Shareholders Fund = 8,00,000+20,00,000+12,00,000+34,50,000 = ₹ 74,50,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{10,00,000}{74,50,000}$ = 13.42%

P/E ratio in this case will be 25 times

Option 2: Debt option

Debt = 10,00,000+34,50,000 = ₹ 44,50,000
Shareholders Fund = 8,00,000+20,00,000+12,00,000 = ₹ 40,00,000

Debt Equity ratio(Debt/Shareholders fund) = $\frac{44,50,000}{40,00,000}$ = 111.25%

Debt equity ratio has crossed the limit of 80% hence PE ratio in this case will remain at 18 times.
Number of Equity Shares to be issued = ₹ 34,50,000/ ₹ 150 = 23,000

(iii) Calculation of Earnings per Share and Market Price per share

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

Calculation of EPS and MPS under two financial options

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

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

Q.7

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

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

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

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

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

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

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

Current market price per share is ₹ 200.
Slab wise interest rate for fund borrowed is as follows:

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

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

Ans.

Alternative 1 = Raising Debt of ₹ 5 lakh + Equity of ₹ 15 lakh
Alternative 2 = Raising Debt of ₹ 10 lakh + Equity of ₹ 10 lakh
Alternative 3 = Raising Debt of ₹ 14 lakh + Equity of ₹ 6 lakh

Calculation of Earnings per share (EPS)

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

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

Working Notes (W.N.):

(a) Calculation of Earnings before Interest and Tax (EBIT)

Particulars		
Output (1,00,000 + 50%)	(A)	1,50,000
Selling price per unit		₹ 40
Less: Variable cost per unit (₹ 20 – 15%)		₹ 17
Contribution per unit	(B)	₹ 23
Total contribution	**(A x B)**	**₹ 34,50,000**

Less: Fixed Cost (₹ 10,00,000 + ₹ 5,00,000)	₹ 15,00,000
EBIT	**₹ 19,50,000**

(b) Calculation of interest on Debt

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

(c) Number of equity shares to be issued

$$\text{Alternative 1} = \frac{(20,00,000 - 5,00,000)}{200\ (\text{Market price of share})} = \frac{15,00,000}{200} = 7,500 \text{ shares}$$

$$\text{Alternative 2} = \frac{(20,00,000 - 10,00,000)}{200\ (\text{Market price of share})} = \frac{10,00,000}{200} = 5,000 \text{ shares}$$

$$\text{Alternative 3} = \frac{(20,00,000 - 14,00,000)}{200\ (\text{Market price of share})} = \frac{6,00,000}{200} = 3,000 \text{ shares}$$

(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**

Q.8

Current Capital Structure of XYZ Ltd is as follows:
Equity Share Capital of 7 lakh shares of face value ₹ 20 each
Reserves of ₹ 10,00,000
9% bonds of ₹ 3,00,00,000
11% preference capital: 3,00,000 shares of face value ₹ 50 each

Additional Funds required for XYZ Ltd are ₹ 5,00,00,000. XYZ Ltd is evaluating the following alternatives:

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

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

Any new equity capital would be issued at a face value of ₹ 20 each. Any new preferential capital would be issued at a face value of ₹ 20 each. Tax rate is 34%
DETERMINE the indifference point under both the alternatives.

Ans.

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

Proposed Capital Structure

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

Interest for Proposal I = ₹ 3,00,00,000 x 9% + ₹ 3,75,00,000 x 10%
= ₹ 27,00,000 + ₹ 37,50,000
= ₹ 64,50,000

Preference Dividend for Proposal I = ₹ 1,50,00,000 x 11% = ₹ 16,50,000
Interest for Proposal II = ₹ 3,00,00,000 x 9% = ₹ 27,00,000
Preference Dividend for Proposal II = ₹ 1,50,00,000 x 11% + ₹ 2,50,00,000 x 12%
= ₹ 16,50,000 + ₹ 30,00,000 = ₹ 46,50,000

Let the indifference point be ₹ X

For Proposal I,

$$EPS = \frac{(X - ` 64,50,000) \times 0.66 - ` 16,50,000}{13,25,000} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

For Proposal II,

$$EPS = \frac{(X - ` 27,00,000) \times 0.66 - ` 46,50,000}{13,25,000} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Equating (1) and (2),

$$EPS = \frac{(X - 64,50,000) \times 0.66 - 16,50,000}{13,25,000} = \frac{(X - `27,00,000) \times 0.66 - 46,50,000}{19,50,000}$$

$$= \frac{0.66X - 42,57,000 - 16,50,000}{1,325} = \frac{0.66X - 17,82,000 - 46,50,000}{1,950}$$

$$\frac{0.66X - `59,07,000}{53} = \frac{0.66X - 64,32,000}{78}$$

₹ 51.48X – ₹ 46,07,46,000 = ₹ 37.98X - ₹34,08,96,000
₹ 16.5X = ₹ 11,98,50,000
Indifference Point = X = ₹ 72,63,636.36

Q.9

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

Proposal	Equity shares (%)	Debts (%)	Preference shares (%)
P	100	-	-
Q	50	50	-
R	50	-	50

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

(ii) Tax rate –40%

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

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

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

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

- Earnings per share
- Financial break-even-point

COMPUTE the EBIT range among the plans for indifference.

Ans. (i) Computation of Earnings per Share (EPS)

Plans	P (₹)	Q (₹)	R (₹)
Earnings before interest & tax (EBIT)	3,60,00,000	3,60,00,000	3,60,00,000
Less: Interest charges	--	(48,00,000)	--
Earnings before tax (EBT)	3,60,00,000	3,12,00,000	3,60,00,000
Less : Tax @ 40%	(1,44,00,000)	(1,24,80,000)	(1,44,00,000)
Earnings after tax (EAT)	2,16,00,000	1,87,20,000	2,16,00,000
Less : Preference share dividend	--	--	(48,00,000)

Earnings available for equity shareholders	2,16,00,000	1,87,20,000	1,68,00,000
No. of equity shares	40,00,000	20,00,000	20,00,000
E.P.S	5.40	9.36	8.40

(ii) Computation of Financial Break-even Points

Proposal 'P' = 0

Proposal 'Q' = ₹48,00,000 (Interest charges)

Proposal 'R' = Earnings required for payment of preference share dividend i.e. ₹48,00,000 / 0.6 = ₹80,00,000

(iii) Computation of Indifference Point between the Proposals

Combination of Proposals

(a) Indifference point where EBIT of proposal "P" and proposal 'Q' is equal

$$\frac{EBIT(1-0.4)}{40,00,000 shares} = \frac{(EBIT - `48,00,000)(1-0.4)}{20,00,000 shares}$$

0.6 EBIT = 1.2 EBIT – ₹57,60,000

EBIT = ₹96,00,000

(b) Indifference point where EBIT of proposal 'P' and proposal 'R' is equal:

$$\frac{EBIT(1-0.40)}{40,00,000 shares} = \frac{EBIT(1-0.40) - 48,00,000}{20,00,000 shares}$$

$$\frac{0.6EBIT}{40,00,000 shares} = \frac{0.6EBIT - `48,00,000}{20,00,000 shares}$$

0.30 EBIT = 0.6 EBIT – ₹48,00,000

EBIT = $\frac{48,\ 00,\ 000}{0.30}$ = 1,60,00,000

(c) Indifference point where EBIT of proposal 'Q' and proposal 'R' are equal

$$\frac{(EBIT - 48,00,000)(1-0.4)}{20,00,000 shares} = \frac{EBIT(1-0.4) - `48,00,000}{20,00,000 shares}$$

There is no indifference point between proposal 'Q' and proposal 'R'

Q.10

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

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

Required:

Compute the earning per share if:

(i) The additional funds were raised through debts.
(ii) The additional funds were raised by issue of Equity shares.
Advise whether the company should go for expansion plan and which sources of finance should be preferred.

Ans

Working Notes:

(1) **Capital employed before expansion plan:**

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

(2) **Earnings before interest and tax (EBIT)** = 4,50,000

(3) **Return on Capital Employed (ROCE):**

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

(4) **Earnings before interest and tax (EBIT) after expansion scheme:**
After expansion, capital employed = ₹ 30,00,000 + ₹ 6,00,000 = ₹ 36,00,000
Desired EBIT = 15% x ₹ 36,00,000 = **₹ 5,40,000**

(i) & (ii) Computation of Earnings Per Share (EPS) under the following options:

	Present situation	Expansion scheme Additional funds raised as	
		Debt (i)	Equity (ii)
	(₹)	(₹)	(₹)
Earnings before Interest 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 $\left(\frac{1,98,000}{80,000}\right)$	**2.610** $\left(\frac{2,08,800}{80,000}\right)$	**1.800** $\left(\frac{2,52,000}{1,40,000}\right)$

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

Q.11

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

Particulars	A Ltd.	B Ltd.
Expected Net Operating Income	₹ 18,00,000	₹ 18,00,000
12% Debt	₹ 54,00,000	-
Equity Capitalization Rate	-	18

Required:

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

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

Ans.

(a) Assuming no tax as per MM Approach.

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

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (Vu) = [NOI/ke] = 18,00,000/0.18 = ₹ 1,00,00,000

Ke of Unlevered Firm (given) = 0.18

Ko of Unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Nil) = ₹ 1,00,00,000 + (54,00,000 × nil)
= ₹1,00,00,000

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

	Particulars	A Ltd.	B Ltd.
A.	Net Operating Income (NOI)	18,00,000	18,00,000
B.	Less: Interest on Debt (I)	6,48,000	-
C.	Earnings of Equity Shareholders (NI)	11,52,000	18,00,000
D	Overall Capitalization Rate (ko)	0.18	0.18
E	Total Value of Firm (V = NOI/ko)	1,00,00,000	1,00,00,000
F	Less: Market Value of Debt	54,00,000	-
G	Market Value of Equity (S)	46,00,000	1,00,00,000
H	Equity Capitalization Rate [ke = NI /S]	0.2504	0.18
I	Weighted Average Cost of Capital [WACC (ko)]* ko = (ke×S/V) + (kd×D/V)	0.18	0.18

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	46,00,000	0.46	0.2504	0.1152

Debt	54,00,000	0.54	0.12*	0.0648
Total	81,60,000			0.18

*Kd = 12% (since there is no tax) WACC = 18%

(b) Assuming 40% taxes as per MM Approach

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

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of unlevered Firm (Vu) = [NOI (1 - t)/ke] = 18,00,000 (1 – 0.40)] / 0.18

= ₹60,00,000

Ke of unlevered Firm (given) = 0.18

Ko of unlevered Firm (Same as above = ke as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

Total Value of Levered Firm (VL) = Vu + (Debt× Tax)

= ₹ 60,00,000 + (54,00,000 × 0.4)

= ₹ 81,60,000

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

= 18% (i.e. Ke = Ko)

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of a Ltd

Particulars	A Ltd.
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [ke = NI/S]	0.2504
Weighted Average Cost of Capital (ko)* ko = (ke×S/V) + (kd×D/V)	13.23

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000			0.1323

*Kd= 12% (1- 0.4) = 12% × 0.6 = 7.2% WACC = 13.23%

Q.12

Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of ₹ 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of ₹ 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company.

Required:

CALCULATE the value of companies' P and Q using

(i) Net Income Approach and

(ii) Net Operating Income Approach.

Ans.

(i) Valuation under Net Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Earnings before Interest & Tax (EBIT) (20% of ₹ 30,00,000)	6,00,000	6,00,000
Less: Interest (10% of ₹ 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100 /15)
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

(ii) Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Capitalisation of earnings at 15% $\left(\frac{(1-0.5)}{5}\right)$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 – 0.5)}	9,00,000	Nil
Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

Q.13

Following data is available in respect of two companies having same business risk: Capital employed = ₹ 12,00,000, EBIT = ₹ 2,40,000 and Ke = 15%

Sources	Dumbo Ltd (₹)	Jumbo Ltd (₹)
Debt (@12%)	4,00,000	Nil
Equity	8,00,000	12,00,000

An investor is holding 20% shares in the levered company. CALCULATE the increase in annual earnings of investor if arbitrage process is undertaken.

Also EXPLAIN the arbitrage process if Ke = 20% for Dumbo Ltd instead of 15%.

Ans.

(I). Valuation of firms

Particulars	Dumbo Ltd (₹)	Jumbo Ltd (₹)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × ₹ 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	15%	15%
Value of Equity (S)	12,80,000	16,00,000
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	16,80,000	16,00,000

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

(II) Investment & Borrowings

	₹
Sell shares in Levered company (12,80,000 x 20%)	2,56,000
Borrow money (4,00,000 x 20%)	80,000
Buy shares in Unlevered company	3,36,000

(III) Change in Return

	₹
Income from shares in Unlevered company (2,40,000 x 3,36,000/16,00,000)	50,400
Less: Interest on loan (80,000 x 12%)	9,600
Net Income from unlevered firm	40,800
Less: Income from Levered firm (1,92,000 x 20%)	38,400
Incremental Income due to arbitrage	2,400

Arbitrage process if Ke = 20%

(I). Valuation of firms

Particulars	Dumbo Ltd (₹)	Jumbo Ltd (₹)
EBIT	2,40,000	2,40,000
Less: Interest on debt (12% × ₹ 4,00,000)	48,000	Nil
Earnings available to Equity shareholders	1,92,000	2,40,000
Ke	20%	15%
Value of Equity (S) (Earnings available to Equity shareholders/Ke)	9,60,000	16,00,000
Debt (D)	4,00,000	Nil
Value of Firm (V) = S + D	13,80,000	16,00,000

Value of unlevered company is more than that of levered company. Therefore, investor will sell his shares in unlevered company and buy proportionate shares and debt in levered company i.e. 20% share.

(II). Investment & Borrowings

	₹
Sell shares in unlevered company (16,00,000 x 20%)	3,20,000
Buy shares in levered company (9,60,000 x 20%)	1,92,000
Buy Debt of levered company	1,28,000

(III). Change in Return

	₹
Income from shares in levered company (1,92,000 x 20%)	38,400
Add: Interest on debt of levered (1,28,000 x 12%)	15,360
Net Income from levered firm	53,760
Less: Income from unlevered firm (2,40,000 x 20%)	48,000
Incremental Income due to arbitrage	5,760

Q.14

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

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

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

(c) BRIEF OUT the remedies for Over-Capitalisation.

Ans.

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

Value of a Firm = $\frac{NOI}{K0}$

1,20,00,000 = $\frac{21,60,000}{K0}$

k0

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

Under MM approach, $ke = k + \frac{D}{E}(k0 - kd)$

Statement of equity capitalization under MM approach

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

(b) Remedies for Over-Capitalisation: Following steps may be adopted to avoid the negative consequences of over-capitalisation-

(i) Company should go for thorough reorganization.
(ii) Buyback of shares.
(iii) Reduction in claims of debenture-holders and creditors.
(iv) Value of shares may also be reduced. This will result in sufficient funds for the company to carry out replacement of assets.

Q.15

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
	4,00,00

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.

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 assuming new equity is issued at ₹ 40 per share?

Ans.

(A) (i) **Cost of new debt**

$$K_d = \frac{I(1-t)}{P_0} = \frac{16(1-0.3)}{96} = 0.11667$$

(ii) **Cost of new preference shares**

$$K_p = \frac{2.22}{18.5} = 0.12$$

(iii) **Cost of new equity shares**

$$K_e = \frac{D_1}{P_0} + g = \frac{2.36}{47.20} + 0.10$$

K_e = 0.05 + 0.10 = 0.15

Calculation of g when there is a uniform trend (on the basis of EPS)

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

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

(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:

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

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) =
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	0.1507

Q.16

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.

Ans.

W.N. 1

Cum-dividend price of Preference shares = ₹ 18

Less: Dividend (8/100) x 25 = ₹ 2

∴ Market Price of Preference shares = ₹ 16

$$K_p = \frac{2}{16} = 0.125 \text{ (or) } 12.5\%$$

$$\text{No. of Preference shares} = \left(\frac{4,00,000}{25}\right) = 16,000$$

W.N. 2

$$\text{Market price of Debentures} = \left(\frac{120}{100}\right) x100 = Rs\ 120$$

$$K_d = \left[\frac{12(1-0.3)}{120}\right] = 0.07 \text{ (or) } 7\%$$

No. of Debentures = $\left(\frac{6,00,000}{100}\right)$ = 6,000

W.N.3

Market Price of Equity shares = Rs 39

Ke (given) = 19% or 0.19

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

Sources	Market Value (₹)	Nos.	Total Market value (₹)	Weight	Cost of Capital	Product
Equity Shares	39	50,00	19,50,000	0.6664	0.19	0.1266
Preference Shares	16	16,00	2,56,000	0.0875	0.125	0.0109
Debentures	120	6,00	7,20,000	0.2461	0.07	0.0172
					WACC =	0.1547

WACC = 0.1547 or 15.47%

Q.17

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

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

Additional information:

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

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

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

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

V. Tax: Corporate tax rate is 35%.Ignore dividend tax.

Floatation cost would be calculated on face value.

Ans

(i) Cost of Equity (K_e) = $\frac{D_1}{P_O\text{-}F} + g$ $\frac{15}{125-5}$ +0.06 *

K_e = 0.125 + 0.06 = 0.185

*Calculation of g:

₹ 10.6$(1+g)^5$ = ₹ 14.19

Or, $(1+g)^5 = \frac{14.19}{10.6}$ =1.338

Table (FVIF) suggests that ₹1 compounds to ₹1.338 in 5 years at the compound rate of 6 percent. Therefore, g is 6 per cent.

(ii) Cost of Retained Earnings (K_r) = $\frac{D_1}{P_O} + g = \frac{15}{125} + 0.06 = 0.18$

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

(iv) Cost of Debentures (K_d) = $\frac{I(1-t)+\frac{RV-NP}{n}}{\frac{RV+NP}{n}} = \frac{15(1-0.35)+\frac{100-91.75}{11 years}}{\frac{100+91.75}{2}}$

$= \frac{15\times0.65+0.75}{95.875} = \frac{10.5}{95.875} = 0.1095$

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

Market price of debentures (approximation method)

= ₹ 15 ÷ 0.16 = ₹ 93.75

Sale proceeds from debentures = ₹93.75 – ₹ 2 (i.e., floatation cost) = ₹91.75

Market value (P0) of debentures can also be found out using the present value method:

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

P_0 = ₹15 × 5.029 + ₹100 × 0.195 P_0 = ₹75.435 + ₹19.5 = ₹ 94.935

Net Proceeds = ₹94.935 – 2% of ₹100 = ₹ 92.935 Accordingly, the cost of debt can be calculated

Total Cost of capital [BV weights and MV weights]

(Amount in (₹) lakh)

Source of capital	Weights		Specific Cost (K)	Total cost	
	BV	MV		(BV × K)	(MV × K)
Equity Shares	120	160*	0.1850	22.2	29.6
Retained Earnings	30	40*	0.1800	5.4	7.2
Preference Shares	36	33.75	0.1429	5.14	4.82
Debentures	9	10.4	0.1095	0.986	1.139
Total	195	244.15		33.73	42.76

*Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings i.e., 120:30 or 4:1.

Weighted Average Cost of Capital (WACC):

Using Book Value = $\frac{33.73}{195}$ = 0.1729 or 17.29%

Using Market Value = $\frac{42.76}{244.15}$ = 0.1751 or 17.51%

Q.18

A company issues:

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

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

Assuming corporate tax rate is 40%.

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

(ii) Use YTM method to CALCULATE cost of preference shares.

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

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

Ans

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

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

$P_6 = 65.28$

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

NP = 95

n = 6

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

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

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

K_d = 13.24%

(ii) Calculation of Cost of Preference Shares:

Net Proceeds = 100 (1.1) - 6% of 100 (1.1)
= 110 - 6.60
= 103.40

Redemption Value= 100

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

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

$$= 3\% + \frac{2\%}{17.04} \times 13.65$$

K_p = 4.6021%

Q.19

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.

(v) Market price of share using Dividend growth model.

Ans (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:

$$P=\frac{D+\frac{12\%}{8\%}(10\%-0)}{8\%}$$

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 Ke 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:

$$P=\frac{D+\frac{r}{k_e}(E-D)}{k_e}=\frac{9.2+\frac{12\%}{0.12}(10\%-9.2)}{0.12}=₹\ 83.33$$

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

$$P=\frac{D_1}{(Ke-g)}=9.2883/(0.08-0.0096)=9.2883/0.0704=₹\ 131.936$$

Alternative
Alternatively, without applying growth on dividend

$$P=\frac{E(1-b)}{Ke-br}=\frac{10(1-0.08)}{0.08-(0.08'0.12)}=₹\ 130.68$$

Q.20

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.

Ans

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

Step 1: Calculate price at the end of the period

Ke = 15%, P_0 = ₹100, D_1 = 0

$$P_0 = \frac{P_1 + D_1}{1 + Ke}$$

$$₹100 = \frac{P_1 + 0}{1 + 0.15}$$

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_0 = [(n+Δn)P1-I+E]/(1+Ke)

nP_0 = [(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_0= ₹100, D_1= ₹10

$$P_0 = \frac{P1 + D1}{1 + Ke}$$

$$₹100 = \frac{P1 + 10}{1 + 0.15}$$

P_1 = ₹105

Step 2: Calculation of funds required for investment

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_0 = [(n+Δn)P1 – I+E]/(1+Ke)

nP_0 = [(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.

Q.21

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

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

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

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

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

Ans

Market price using Gordon's formula

D0 (1 + g)

$$P_0 = \frac{D_0\ (1+g)}{ke\ -g}$$

D0 = 2.5×4 = 10 per share (annual)

g = br or retention ratio x rate of return

Calculation of expected retention ratio

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

g = 0.54 × 0.10= 0.054 or 5.4% P_0

$$P_0 = \frac{D_0\ (1+g)}{ke\ -g}$$

Ke - g

$$P_0 = \frac{10(1+0.054)}{0.0885\ -0.054} = \frac{10.54}{0.0345} = 305.51$$

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

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

Q.22

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 under priced.

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

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

$$P=\frac{D_1}{(1+Ke)^1}+\frac{D_2}{(1+Ke)^2}+\frac{D_3}{(1+Ke)^3}+\frac{D_4}{(1+Ke)^4}+\frac{D_4(1+g)}{(Ke-g)}x\frac{1}{(1+Ke)^4}$$

Where,

P = Price per share
K_e = Required rate of return on equity

g = Growth rate

$$P = \frac{140x1.12}{(1+0.18)^1}+\frac{156.80 \times 1.12}{(1+0.18)^2}+\frac{175.62 \times 1.12}{(1+0.18)^3}+\frac{196x1.12}{(1+0.18)^4}+\frac{220.29(1+0.05)}{(0.18-0.05)}x\frac{1}{(1+0.18)^4}$$

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.

Q.23

K Ltd. has a Quarterly cash outflow of ₹ 9,00,000 arising uniformly during the Quarter.
The company has an Investment portfolio of Marketable Securities. It plans to meet the demands for cash by periodically selling marketable securities. The marketable securities are generating a return of 12% p.a. Transaction cost of converting investments to cash is ₹ 60. The company uses Baumol model to find out the optimal transaction size for converting marketable securities into cash. Consider 360 days in a year.
You are required to calculate
(i) Company's average cash balance,
(ii) Number of conversions each year and
(iii) Time interval between two conversions.

Ans.

(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)	$= \frac{12}{100} = 0.12$
Optimum cash balance (C)	$= \sqrt{\frac{2UP}{S}} = \sqrt{\frac{2'36,00,000'60}{0.12}}$ = ₹ 60,000
∴ Average Cash balance	$= \frac{(0+60,000)}{2}$ = ₹ 30,000

(ii) Number of conversions p.a.

Annual cash outflow	= ₹ 36,00,000
Optimum cash balance	= ₹ 60,000
∴ No. of conversions p.a.	$= \frac{36,00,000}{60,000} = 60$

(iii) Time interval between two conversions

No. of days in a year	= 360

No. of conversions p.a. = 60

$\therefore$ Time interval = $\frac{360}{60}$ = 6 days

Q.24

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.

Ans.

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	2,00,000		
To Accrued interest on loan	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			Land and Building	20,00,000		

capital			*Less:* Depreciation	1,00,000	19,00,000	
10,00,000 equity		1,00,00,000				
			Plant and	10,00,000		
shares of ₹10			Machinery			
each			*Less:* Depreciation	50,000	9,50,000	
Issued,			Furniture	5,00,000		
Subscribed and			*Less:* Depreciation	25,000	4,75,000	
Paid up capital						
5,00,000 equity		50,00,000	Motor Vehicles	5,00,000		
Shares of ₹10			*Less:* Depreciation	25,000	4,75,000	38,00,000
each						
			Current Assets:			
Reserve and						
Surplus:			Stock		5,00,000	
			Sundry debtors		42,50,000	
Profit and Loss		22,17,250	Cash		11,75,000	59,25,000
Long-term loans		7,75,000				
Current liabilities						
and provisions:						
Sundry creditors	15,87,500					
Accrued interest	45,250					
Outstanding	1,00,000	17,32,750				
expenses		97,75,000				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	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000

salaries						
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

Q.25

PREPARE monthly cash budget for the first six months of 2021 on the basis of the following information:

(i) Actual and estimated monthly sales are as follows:

Actual	(Rs.)	Estimated	(Rs.)
October 2020	2,00,000	January 2021	60,000
November 2020	2,20,000	February 2021	80,000
December 2020	2,40,000	March 2021	1,00,000
		April 2021	1,20,000
		May 2021	80,000
		June 2021	60,000
		July 2021	1,20,000

(ii) Operating Expenses (including salary & wages) are estimated to be payable as follows:

Month	(Rs.)	Month	(Rs.)
January 2021	22,000	April 2021	30,000
February 2021	25,000	May 2021	25,000
March 2021	30,000	June 2021	24,000

(iii) Of the sales, 75% is on credit and 25% for cash. 60% of the credit sales are collected after one month, 30% after two months and 10% after three months.

(iv) Purchases amount to 80% of sales and are made on credit and paid for in the month preceding the sales.

(v) The firm has 12% debentures of Rs.1,00,000. Interest on these has to be paid quarterly in January, April and so on.

(vi) The firm is to make an advance payment of tax of Rs. 5,000 in April.

(vii) The firm had a cash balance of Rs. 40,000 at 31st Dec. 2020, which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

Ans. **Monthly Cash Budget for first six months of 2021**

(Amount in Rs.)

Particulars	Jan.	Feb.	Mar.	April	May	June
Opening balance	40,000	40,000	40,000	40,000	40,000	40,000
Receipts:						
Cash sales	15,000	20,000	25,000	30,000	20,000	15,000
Collection from debtors	1,72,500	97,500	67,500	67,500	82,500	70,500
Total cash available (A)	2,27,500	1,57,500	1,32,500	1,37,500	1,42,500	1,25,500
Payments:						
Purchases	64,000	80,000	96,000	64,000	48,000	96,000
Operating Expenses	22,000	25,000	30,000	30,000	25,000	24,000
Interest on debentures	3,000	-	-	3,000	-	-
Tax payment	-	-	-	5,000	-	-
Total payments (B)	89,000	1,05,000	1,26,000	1,02,000	73,000	1,20,000
Minimum cash balance desired	40,000	40,000	40,000	40,000	40,000	40,000
Total cash needed (C)	1,29,000	1,45,000	1,66,000	1,42,000	1,13,000	1,60,000
Surplus/(deficit) (A - C)	98,500	12,500	(33,500)	(4,500)	29,500	(34,500)
Investment/financing						
Temporary Investments	(98,500)	(12,500)	-	-	(29,500)	-
Liquidation of temporary investments or temporary borrowings			33,500	4,500	-	34,500
Total effect of investment/financing(D)	(98,500)	(12,500)	33,500	4,500	(29,500)	34,500
Closing cash balance (A + D - B)	40,000	40,000	40,000	40,000	40,000	40,000

Workings:

1. **Collection from debtors:** **(Amount in Rs.)**

	Year 2020			Year 2021					
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Total sales	2,00,000	2,20,00	2,40,00	60,00	80,000	1,00,00	1,20,000	80,000	60,000
Credit sales (75% of total sales)	1,50,000	1,65,00	1,80,00	45,00	60,000	75,00	90,000	60,000	45,000
Collections:									
One month		90,00	99,00	1,08,00	27,000	36,00	45,000	54,000	36,000
Two months		0	45,00	49,50	54,000	13,500	18,000	22,500	27,000
Three months				15,000	16,500	18,000	4,500	6,000	7,500
Total collections				**1,72,5**	**97,500**	**67,50**	**67,500**	**82,500**	**70,500**

2. **Payment to Creditors:** **(Amount in Rs.)**

	Year 2021						
	Jan	Feb	Mar	Apr	May	Jun	Jul
Total sales	60,000	80,000	1,00,000	1,20,000	80,000	60,000	1,20,000
Purchases (80% of total sales)	48,000	64,000	80,000	96,000	64,000	48,000	96,000
Payment:							
One month prior	**64,000**	**80,000**	**96,000**	**64,000**	**48,000**	**96,000**	

Q.26

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

Ans. (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	128	176	120	120	160

Credit Sales (4/5th of total	512	704	480	480	640

(2) Calculation of Credit Sales Receipts

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 (₹ithousands)

	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 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**

Q.27

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.)

Ans (i) Calculation of Cash Discount

Cash Discount = Total credit sales × % of customers who take up discount × Rate

Present Policy = $\frac{12,00,000 \times 50 \times 0.01}{100}$ = ₹ 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 × $\frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$

= 9,60,000 × $\frac{40}{360} \times \frac{15}{100}$ = ₹ 16,000

Proposed Policy: = Total Cost × $\frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$

= 12,00,000 × $\frac{30}{360} \times \frac{15}{100}$ = ₹ 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.

Q.28

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	₹ 20 lakh

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.

Ans **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	7.2	3.6
		(360 x 0.03)	(360 x 0.02)	(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

$$\text{Opportunity Cost} = \text{Total Cost} \times \frac{\text{Collection period}}{12} \times \frac{\text{Rate of Re turn}}{100}$$

Present Policy = ₹ 288 lakhs × $\frac{2}{12} \times \frac{20}{100}$ = ₹ 9.6 lakhs

Policy X = ₹ 288 lakhs × $\frac{1.5}{12} \times \frac{20}{12}$ = ₹ 7.2 lakhs

Policy X = ₹ 288 lakhs × $\frac{1}{12} \times \frac{20}{100}$ = ₹ 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	7.2	3.6
		(360 x 0.03)	(360 x 0.02)	(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 × $\frac{\text{Collection period}}{12}$

Present Policy = ₹ 288 lakhs × $\frac{2}{12}$ = ₹ 48 lakhs

Policy X = ₹ 288 lakhs × $\frac{1.5}{12}$ = ₹ 36 lakhs

Policy Y = ₹ 288 lakhs × $\frac{1}{12}$ = ₹ 24 lakhs

Q.29

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?

Ans

A. Statement showing the Evaluation of Debtors Policies (Total Approach)

(Amount in ₹)

Particulars		Present Policy 45 days	Proposed Policy W	Proposed Policy X	Proposed Policy Y	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

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

Present Policy = $6,75,000 \times \frac{45}{360} \times \frac{20}{100}$ = 16,875

Policy W = $7,15,000 \times \frac{60}{360} \times \frac{20}{100}$ = 23,833

Policy X = $7,35,000 \times \frac{75}{360} \times \frac{20}{100}$ = 30,625

Policy Y = $7,75,000 \times \frac{90}{360} \times \frac{20}{100}$ = 38,750

Policy Z = $8,15,000 \times \frac{115}{360} \times \frac{20}{100}$ = 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	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	-	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

$$\text{Expected Rate of Return} = \frac{\text{Incremental Expected Profit}}{\text{Incremental Investment in Receivables}} \times 100$$

$$\text{For Policy W} = \frac{14,500}{34,792} \times 100 = 41.96\%$$

$$\text{For Policy X} = \frac{19,200}{68,750} \times 100 = 27.93\%$$

$$\text{For Policy Y} = \frac{27,500}{109,375} \times 100 = 25.14\%$$

For Policy Z $= \frac{34,600}{1,75,972} \times 100 = 19.66\%$

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.

Q.30

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).

Ans

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 × Sale 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.

Q.31

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 informations are available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31200 plus unit of work in progress 12000
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	24000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment)	15 days
Expected Cash Balance	₹ 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.

Ans

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

(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 = $\frac{17,28,000}{360 days}$ × 30 days = ₹1,44,000

(iv) Finished goods stock:

24,000 units @ ₹ (40+15+30) per unit = ₹20,40,000

(v) Debtors for sale: ₹ 6,12,000x $\frac{60 \text{ days}}{360 days}$ = ₹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	₹ 1,44,000
	₹18,72,000

Credit allowed by suppliers = $\frac{18,72,000}{360 days}$ × 30days = ₹ 1,56,000

(vii) Creditors for wages:

Outstanding wage payment = $\frac{5,58,000}{360 days}$ ×15days = ₹ 23,250

Q.32

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-inprogress	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 Profitb/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.

Ans

Computation of Operating Cycle

(1) Raw Material Storage Period (R)

$$\text{Raw Material Storage Period (R)} = \frac{\text{Average Stock of Raw Material}}{\text{Daily Average Consumption of Raw material}}$$

$$= \frac{(14,40,000 + 16,00,000) / 2}{86,40,000 / 365} = 64.21 \text{ Days}$$

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)

$$\text{Conversion/Processing Period} = \frac{\text{AverageStock of WIP}}{\text{Daily Average Pr oduction}}$$

$$= \frac{(4,80,000 + 8,00,000) / 2}{1,23,20,000 / 365} = 18.96 \text{ days}$$

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)

$$\text{Finished Goods Storage Period} = \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Good Sold}}$$

$$= \frac{(20,80,000 + 24,00,000) / 2}{1,20,00,000 / 365} = 68.13 \text{ Days}$$

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)

$$\text{Receivables Collection Period} = \frac{\text{Average Receivables}}{\text{Daily averagecredit sales}}$$

$$= \frac{(12,00,000 + 16,00,000) / 2}{1,60,00,000 / 365} = 31.94 \text{ Days}$$

(5) Payables Payment Period (C)

$$\text{Payables Payment Period} = \frac{\text{Average Payable}}{\text{Daily averagecredit sales}}$$

$$= \frac{(16,00,000 + 19,20,000) / 2}{88,00,000 / 365} = 73 \text{ Days}$$

(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

$$\text{Working Capital Required} = \frac{\text{Total Operating Expenses}}{\text{Number of Operating Cycles per year}}$$

$$= \frac{1,40,00,000}{3.311} = ₹ 42,28,329.81$$

Q.33

MT Ltd. has been operating its manufacturing facilities till 31.3.202 1 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) Finished	88,000
goods (valued at total cost) Sundry debtors	2,88,000
	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.

Ans (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 = $\frac{\text{Sales}}{\text{Unit sellingprice}} = \frac{17,28,000}{72}$ = 24,000 units

(3) Stock of Raw Materials in units on 31.3.2021

$= \frac{\text{Value of stock}}{1,44,000}$ = 6,000 units

Cost per unit ₹ 24

(4) Stock of work-in-progress in units on 31.3.2021

$= \frac{\text{Value of work}-\text{in}-\text{progress}}{\text{PrimeCost per unit}} = \frac{88,000}{(24+20)}$ =2,000units

(5) Stock of finished goods in units 2020-213

$= \frac{\text{Value of stock}}{\text{TotalCost per unit}} = \frac{2,88,000}{64}$ = 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.