PAPER – 8: FINANCIAL MANAGEMENT AND ECONOMICS FOR FINANCE

PART A: FINANCIAL MANAGEMENT

QUESTIONS

Ratio Analysis

1. 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.

Cost of Capital

2. 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?

Capital Structure

3. 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.

Leverage

4.   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%.

Investment Decisions

5.   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:

Year	1	2	3	4	5
PV factor	0.909	0.826	0.751	0.683	0.621

Risk Analysis in Capital Budgeting

6.   X Ltd is considering installation of new machine with the following details:

Sr. No.	Particulars	Figures
1	Initial Investment	₹ 1400 Crore
2	Annual unit sales	100 Crore
3	Selling price per unit	₹ 40
4	Variable cost per unit	₹ 20
5	Annual Fixed costs	₹ 500 Crore
6	Depreciation	₹ 200 Crore
7	Discount Rate	12%
8	Tax rate	30%

Consider Life of the project as 4 years with no salvage value.

Required:

(i)   CALCULATE the expected NPV of the project.

(ii) COMPUTE the impact on the project's NPV if change in variables is as under and also compute which variable is having maximum impact on NPV.

Sr. No.	Variable	Figures
1	Unit sold per year	85 Crore
2	Selling price per unit	₹ 39

3	Variable cost per unit	₹ 22
4	Annual Fixed costs	₹ 575 Crore

PV factor at 12% are as follows:

Year	1	2	3	4
PV factor	0.893	0.797	0.712	0.636

Dividend Decision

7. 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.

Management of Working Capital

8. 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.

9.   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 basis. The credit allowed by debtors is 2 months.

(f)   Average time lag in payment of all overheads is 1 months and ½ months for direct labour.

(g)   Minimum cash balance of ₹ 8,00,000 is to be maintained.

CALCULATE the estimated working capital required by the company on cash cost basis if the budgeted level of activity is 1,50,000 units for the next year. The company also intends to increase the estimated working capital requirement by 10% to meet the contingencies. (You may assume that production is carried on evenly throughout the year and direct labour and other overheads accrue similarly.)

Miscellaneous

10. (i)   "Profit Maximization cannot be the sole objective of a company". COMMENT.

     (ii) DISCUSS the advantages and disadvantages of raising funds by issue of preference shares.

SUGGESTED ANSWERS

1.   (i)   Return on total assets

Return on total assets $= \dfrac{\text{EBIT } (1 - T)}{\text{Total assets (FA + CA)}}$

$= \dfrac{₹\,2.30\ \text{crores}\ (1 - 0.3)}{₹\,5.20\ \text{crores} + ₹\,7.80\ \text{crores}}$

$= \dfrac{₹\,1.61\ \text{crores}}{₹\,13\ \text{crores}} = 0.1238$ 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 $= \dfrac{\text{Net Profit after taxes (EAT)}}{\text{Owners' equity}}$	$= \dfrac{1,26,84,000}{5,00,00,000}$ = 0.2537 or 25.37%	$= \dfrac{1,29,41,600}{5,00,00,000}$ = 0.2588 or 25.88%	$= \dfrac{1,32,21,600}{5,00,00,000}$ = 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 $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$	$= \dfrac{7.80}{5.76}$ = 1.35	$= \dfrac{7.80}{6.68}$ = 1.17	$= \dfrac{7.80}{7.68}$ = 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%.

2. **(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

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

$$= \frac{₹\,2.36}{₹\,47.20} + 0.10$$

$$= 0.05 + 0.10 = 0.15$$

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 D_1

D_1 = 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 = $\frac{₹\,23,600}{0.80}$ = ₹ 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:

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

The marginal cost of capital will be:

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

3. (a) **Amount of debt to be employed by firm as per traditional approach**

Calculation of Equity, W_d and W_e

Total Capital (₹)	Debt (₹)	W_d	Equity value (₹)	W_e
(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)

K_e	W_e	K_d	W_d	$K_e\ W_e$	$K_d W_d$	K_o
(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 (K_o) remains constant and cost of equity increases linearly with debt.

Value of a firm $= \dfrac{\text{Net Operating Income (NOI}}{K_o}$

₹ 50,00,000 $= \dfrac{₹\,5,00,000}{K_o}$

$K_o = \dfrac{₹\,5,00,000}{₹\,50,00,000} = 10\%$

Statement of Equity Capitalization rate (k_e) under MM approach

Debt (₹)	Equity (₹)	Debt/Equity	K_o	K_d	K_o - K_d	K_e = K_o + (K_o - K_d) $\dfrac{\text{Debt}}{\text{Equity}}$
(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

4. Workings:

1. Contribution   = Sales x P/V ratio

    = ₹ 15,00,000 x 70% = ₹ 10,50,000

2. Operating Leverage $= \dfrac{\text{Contribution}}{\text{Earnings before interest and tax (EBIT}}$

    Or, 1.4 $= \dfrac{₹10,50,000}{\text{EBIT}}$

EBIT   = ₹ 7,50,000

3. Financial leverage $= \dfrac{\text{EBIT}}{\text{EBT}}$

     Or,   1.25 $= \dfrac{₹\,7,50,000}{\text{EBT}}$

     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 $= \dfrac{\text{Contribution}}{\text{EBT}} = \dfrac{₹\,10,50,000}{₹\,6,00,000} =$ **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) = $\dfrac{₹\,1,57,500}{₹\,6,00,000}$ × 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 = $\dfrac{₹\,1,05,000}{₹\,7,50,000} \times 100$ = **14%, hence verified.**

(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) = $\dfrac{₹\ 1,12,500}{₹\ 6,00,000} \times 100$ = **18.75%,**

hence verified.

5. **Workings:**

Calculation of Depreciation:

On Modernized Equipment $= \dfrac{₹\ 1,40,000\ -\ ₹\ 30,000}{5\ \text{years}} = ₹\ 22,000\ \text{p.a.}$

On New machine $= \dfrac{₹\ 3,50,000\ -\ ₹\ 60,000}{5\ \text{years}} = ₹\ 58,000\ \text{p.a.}$

(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	37,260.00
		(₹ 30,000 x 0.621)	(₹ 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.

6. (i) Calculation of Net Cash Inflow per year:

	Particulars	Amount (₹)
A	Selling Price Per Unit (A)	40
B	Variable Cost Per Unit (B)	20
C	Contribution Per Unit (C = A - B)	20
D	Number of Units Sold Per Year	100 Crore
E	Total Contribution (E = C × D)	2,000 Crore
F	Annual Fixed costs	500 Crore
G	Depreciation	200 Crore
H	Net Profit before taxes (H = E - F - G)	1,300 Crore
I	Tax @ 30% of H	390 Crore
J	Net Cash Inflow Per Year (J = H - I + G)	1,110 Crore

Calculation of expected Net Present Value (NPV) of the Project:

Year	Year Cash Flow (₹ in Crore)	PVAF @ 12%	Present Value (PV) (₹ in Crore)
0	(1400.00)	1.000	(1400.00)
1-4	1,110.00	3.038	3,372.18
		Net Present Value	1,972.18

(ii) Sensitivity Analysis under variable different value:

	Changes in variable	Base	Units sold per year is 85 Crore	Selling price per unit is ₹ 39	Variable cost per unit is ₹ 22	Annual Fixed costs is ₹ 575 Crore
	Particulars	(₹)	(₹)	(₹)	(₹)	(₹)
A	Selling Price Per Unit	40	40	39	40	40
B	Variable Cost Per Unit	20	20	20	22	20
C	Contribution Per Unit (C = A - B)	20	20	19	18	20
D	Number of Units Sold Per Year (in Crores)	100	85	100	100	100
E	Total Contribution (E = C × D)	2,000	1,700	1,900	1,800	2,000
F	Annual Fixed Cost (in Crores)	500	500	500	500	575
G	Depreciation (in Crores)	200	200	200	200	200
H	Net Profit before taxes (H = E - F - G)	1,300	1,000	1,200	1,100	1,225
I	Tax @ 30% of H	390	300	360	330	367.50
J	Net Cash Inflow Per Year (J = H - I + G)	1,110	900	1,040	970	1,057.50
K	(J × 3.038)	3,372.18	2,734.20	3,159.52	2,946.86	3,212.69
L	Initial Cash Flow	1,400	1,400	1,400	1,400	1,400
M	NPV (K - L)	1,972.18	1,334.20	1,759.52	1,546.86	1,812.69
N	Change in NPV	-	(637.98)	(212.66)	(425.32)	(159.50)
O	Percentage Change in NPV	-	-32.35%	-10.78%	-21.57%	-8.09%

The above table shows that by varying one variable at a time while keeping the others constant, the impact in percentage terms on the NPV of the project. Thus, it can be seen that the change in units sold per year has the maximum effect on the NPV by 32.35%.

7. **(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, K_e, may be taken at the inverse of P/E ratio. Therefore, K_e 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:

$$P = \frac{D + \dfrac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \dfrac{0.1}{0.08}(10 - 7.5)}{0.08} = ₹\ 132.81$$

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 K_e 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-

$$= \frac{0 + \dfrac{0.1}{0.08}(10 - 0)}{0.08} = ₹\ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

(ii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the K_e would be equal to the rate of return, r, of the firm. The K_e would be 10% (= r) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

(iii) If the P/E is 8 instead of 12.5, then the K_e which is the inverse of P/E ratio, would be 12.5 and in such a situation $k_e > r$ and the market price, as per Walter's model would be:

$$P = \frac{D + \dfrac{r}{K_e}(E - D)}{K_e} = \frac{7.5 + \dfrac{0.1}{0.125}(10 - 7.5)}{0.125} = ₹\ 76$$

8.   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 $= \dfrac{\text{Sales}}{\text{Unit selling price}} = \dfrac{₹\,17,28,000}{₹\,72} = 24,000$ units

(3) Stock of Raw Materials in units on 31.3.2021

$= \dfrac{\text{Value of stock}}{\text{Cost per unit}} = \dfrac{₹\,1,44,000}{₹\,24} = 6,000$ units

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

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

(5) Stock of finished goods in units 2020-21

$= \dfrac{\text{Value of stock}}{\text{Total Cost per unit}} = \dfrac{₹\,2,88,000}{₹\,64} = 4,500$ 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.

9. **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 $\left(\dfrac{1,50,000\,\text{units} \times ₹\,30}{12\ \text{months}} \times 2\ \text{months} \right)$	7,50,000	
Y $\left(\dfrac{1,50,000\,\text{units} \times ₹\,7}{12\ \text{months}} \times 1\ \text{month} \right)$	87,500	
Z $\left(\dfrac{1,50,000\,\text{units} \times ₹\,6}{12\ \text{months}} \times 1\ \text{month} \right)$	75,000	
WIP $\left(\dfrac{1,50,000\,\text{units} \times ₹\,64}{12\ \text{months}} \times 0.5\ \text{month} \right)$	4,00,000	
Finished goods $\left(\dfrac{1,50,000\,\text{units} \times ₹\,88}{12\ \text{months}} \times 1\ \text{month} \right)$	11,00,000	24,12,500
(ii) Receivables (Debtors)		
$\left(\dfrac{1,50,000\,\text{units} \times ₹\,103}{12\ \text{months}} \times 2\ \text{months} \right) \times 0.75$		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 $\left(\dfrac{1,50,000\,\text{units} \times ₹\,30}{12\ \text{months}} \times 2\ \text{months} \right)$	7,50,000	
Y $\left(\dfrac{1,50,000\,\text{units} \times ₹\,7}{12\ \text{months}} \times 1\ \text{month} \right)$	87,500	
Z $\left(\dfrac{1,50,000\,\text{units} \times ₹\,6}{12\ \text{months}} \times 0.5\ \text{month} \right)$	37,500	8,75,000
(ii) Outstanding Direct Labour		1,56,250

$\left(\dfrac{1,50,000\,\text{units}\times\text{₹ }25}{12\text{ months}}\times 0.5\text{ month}\right)$		
(iii) Outstanding Manufacturing and administration overheads $\left(\dfrac{1,50,000\,\text{units}\times\text{₹ }20}{12\text{ months}}\times 1\text{ month}\right)$		2,50,000
(iv) Outstanding Selling overheads $\left(\dfrac{1,50,000\,\text{units}\times\text{₹ }15}{12\text{ months}}\times 1\text{ month}\right)$		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

10. (i) **Following are the reasons due to which Profit Maximization cannot be the sole objective of a company:**

   (a) **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.

   (b) **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.

   (c) **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.

   (d) **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.

   (ii) **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.

SECTION: B: ECONOMICS FOR FINANCE

QUESTIONS

1. (a) The nominal and real GDP of a country in a particular year are ₹ 3000 Crores and ₹ 4700 Crores respectively. Calculate GDP deflator and comment on the level of prices of the year in comparison with the base year.

    (b) Differentiate excess demand and deficient demand.

2. Calculate National Income by Expenditure method and Income method with the help of following data:

Items	₹ in Crores
Compensation of employees	1,200
Net factor income from Abroad	20
Net indirect taxes	120
Profit	800
Private final consumption expenditure	2,000
Net domestic capital formation	770
Consumption of fixed capital	130
Rent	400
Interest	620
Mixed income of self-employed	700
Net export	30
Govt. final consumption expenditure	1100
Operating surplus	1820
Employer's contribution to social security scheme	300

3. (a) Illustrate with an example the redistribution effect of a tax and transfer policy.

    (b) Discuss the importance of the distinction between private costs and social costs.

4. (a) Describe direct government actions to solve negative externalities.

    (b) For an Economy with the following specifications

    Consumption, $C = 50 + 0.75 Y_d$

    Investment, $I = 100$

    Government Expenditure, $G = 200$

Transfer Payments, R= 110

Income Tax = 0.2Y

Calculate the equilibrium of income and the value of expenditure multiplier.

5. (a) (i)   Calculate velocity of money when-

Money Supply = 5000 billion

Price   =110

Volume of transaction = 200

(ii) What will be the outcome if volume of transaction increases to 225?

(b) Assess the role of Bank Rate as an instrument of monetary policy.

6. (a) Explain the concept of Liquidity Trap.

(b) (i)   Examine the relationship between purchasing power of money and general price level.

(ii) Why do people demand money for precautionary motive?

7. How real GDP is a better measure of economic well-being? Explain.

8. Briefly explain the New Trade Theory and its importance.

9. (a) Describe different technical barriers to trade (TBT) and their effects on trade?

(b) Explain Export Duties.

10. (a) What is Arbitrage? What is the outcome of Arbitrage?

(b) Mention the types of transactions in the forex market?

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SUGGESTED ANSWERS/ HINTS

</div>

1. (a)

Nominal GDP	=	₹ 3000 Crores
Real GDP	=	₹ 4700 Crores

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$\frac{3000}{4700} \times 100 = 63.83$$

The price level has fallen since GDP deflator is less than 100 at 63.83.

(b) If the aggregate demand for an amount of output is greater than the full employment level of output, then we say there is excess demand. Excess demand gives rise to 'inflationary gap'. On the other hand, if the aggregate demand for an amount of output is less than the full employment level of output, then we say there is deficient demand. Deficient demand gives rise to a 'deflationary gap' or 'recessionary gap'. Recessionary gap is also known as 'contractionary gap'.

2. By Expenditure method

GDP_{MP} = Private final consumption expenditure + Government final consumption expenditure + Gross domestic capital formation (Net domestic capital formation + depreciation) + Net export

= 2000 + 1100 + (770+ 130) + 30= 4030 Crores

NNP_{FC} or NI   = GDP_{MP} – Depreciation + NFIA – NIT

= 4030 – 130 + 20 – 120= 3800 Crores

By Income method

NNP_{FC} or NI   = Compensation of Employees+ Operating Surplus+ Mixed Income of Self-Employed + NFIA

= 1200+ 1820+ 700+ 20= 3740 Crores

3. (a) Inequality and the resulting loss of social welfare is sought to be tackled by government through an appropriately framed tax and transfer policy. This involves progressive taxation combined with provision of subsidy to low-income households. Proceeds from progressive taxes may be used to finance public services, especially those such as public housing, which particularly benefit low income households. Few examples are: supply of essential food grains at highly subsidized prices to BPL households, free or subsidized education, healthcare, housing, rations and basic goods etc. to the deserving people.

(b) Private cost is the cost faced by the producer or consumer directly involved in a transaction. Social costs refer to the total costs to the society on account of a production or consumption activity and include external costs as well. The actors in the transaction (consumers or producers) tend to ignore those external costs and these are not included in firms' income statements or consumers' decisions. However, these external costs are real and important as far as the society is concerned. If producers do not take into account the externalities, there will be over-production and market failure. Applying the same logic, negative consumption externalities lead to a situation where the social benefit of consumption is less than the private benefit. Therefore, it is important that a distinction be made between private costs and social costs.

4. **(a)** Direct controls prohibit specific activities that explicitly create negative externalities or require that the negative externality be limited to a certain level, for instance limiting emissions.

Government initiatives towards negative externalities may include

1. Direct controls that openly regulate the actions of those involved in generating negative externalities, and

2. Market-based policies that would provide economic incentives so that the self-interest of the market participants would achieve the socially optimal solution.

Direct controls prohibit specific activities that explicitly create negative externalities or require that the negative externality be limited to a certain level, for instance limiting emissions. Production, advertising, use and sale of many commodities and services may be prohibited. Stringent rules may be established in respect of advertising, packaging and labelling etc. Governments may, through legislation, stipulate stringent standards such as environmental standards, emissions standards non adherence of which will invite monetary penalties or/and criminal liabilities. Another method is to create negative incentives through charging fees on activities creating negative externalities Governments may also form special bodies/ boards to specifically address the problem of negative externality. The market-based approaches (such as environmental taxes and cap-and-trade), operate through price mechanism to create an incentive for change.

(b) The level of disposable income Y_d is given by

Y_d	=	Y-Tax + Transfer Payments
		Where, Transfer Payment = 110
	=	Y-0.2 Y+110 = 0.8Y +110
and C	=	50+0.75 Y_d
	=	50+0.75(0.8Y +110) (where Y_d = 0.8Y +110)
	=	50+ (0.75×0.8Y) + (0.75X110) =132.50+0.6Y
C	=	132.50+0.6 Y
Now Y	=	C+I+G, Where C = 132.50+0.6Y, I = 100, G = 200 (Given)
Y	=	(132.50+0.6Y) +100+200
	=	432.50+0.6Y
Y-0.6Y	=	432.50
0.4Y	=	432.50

or Y = 432.50/0.4 = 1,081.25 Crores

Expenditure Multiplier $=\dfrac{1}{1-b}=\dfrac{1}{1-0.6}$ = 2.5 (Multiplier in close economy $=\dfrac{1}{1-b}$)

$$\left(\text{Here } b = MPC = \dfrac{\Delta C}{\Delta Y}\right)$$

5. **(a) (i)** MV=PT;

   5000 x V = 110x200, Therefore V = **4.4**

   (ii) If Volume of transaction 225, then V= **4.95**

   (b) The bank rate has been aligned to the Marginal Standing Facility (MSF) rate and, therefore, as and when the MSF rate changes alongside policy repo rate changes, the bank rate also changes automatically. Now bank rate is used only for calculating penalty on default in the maintenance of Cash Reserve Ratio (CRR) and the Statutory Liquidity Ratio (SLR).

6. **(a)** Liquidity trap is a situation where the desire to hold bonds is very low and approaches zero, and the demand to hold money in liquid form as an alternative approaches infinity. People expect a rise in interest rate and the consequent fall in bond prices and the resulting capital loss. The speculative demand becomes perfectly elastic with respect to interest rate and the speculative money demand curve becomes parallel to the X axis.

   (b) (i) Value of money is linked to its purchasing power. Purchasing power is the inverse of the average or general level of prices as measured by the consumer price index.

   (ii) The amount of money demanded under the precautionary motive is to meet unforeseen and unpredictable contingencies involving money payments and depends on the size of the income, prevailing economic as well as political conditions and personal characteristics of the individual such as optimism/ pessimism, farsightedness etc.

7. Real GDP is calculated in such a way that the goods and services produced in a particular year are evaluated at some constant set of prices or constant prices. In other words, it is calculated using the prices of a selected 'base year'. For example, if 2011-12 is selected as the base year, then real GDP for 2020-21 will be calculated by taking the quantities of all goods and services produced in 2020-21 and multiplying them by their 2011-12 prices. Thus, real GDP or GDP at constant prices refers to the total money value of the final goods and services produced within the domestic territory of a country during an accounting year, estimated using base year prices. Real GDP is an inflation-adjusted measure and is not affected by changes in prices; it changes only when there is change in the amount of output produced in the economy. Therefore, Real GDP is a better

measure of economic well-being as it shows the true picture of the change in production of an economy.

The calculation of real GDP gives us a useful measure of inflation known as GDP deflator. The GDP deflator is the ratio of nominal GDP in a given year to real GDP of that year.

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

8. **New Trade Theory** (NTT) is an economic theory that was developed in the 1970s as a way to understand international trade patterns. NTT helps in understanding why developed and big countries are trade partners when they are trading similar goods and services. These countries constitute more than 50% of world trade.

    This is particularly true in key economic sectors such as electronics, IT, food, and automotive. We have cars made in the India, yet we purchase many cars made in other countries.

    These are usually products that come from large, global industries that directly impact international economies. The mobile phones that we use are a good example. India produces them and also imports them. NTT argues that, because of substantial economies of scale and network effects, it pays to export phones to sell in another country. Those countries with the advantages will dominate the market, and the market takes the form of monopolistic competition.

    Monopolistic competition tells us that the firms are producing a similar product that isn't exactly the same, but awfully close. According to NTT, two key concepts give advantages to countries that import goods to compete with products from the home country. These are:

    Economies of Scale: As a firm produces more of a product, its cost per unit keeps going down. So if the firm serves domestic as well as foreign market instead of just one, then it can reap the benefit of large scale of production consequently the profits are likely to be higher.

    Network effects refer to the way one person's value for a good or service is affected by the value of that good or service to others. The value of the product or service is enhanced as the number of individuals using it increases. This is also referred to as the 'bandwagon effect'. Consumers like more choices, but they also want products and services with high utility, and the network effect increases utility obtained from these products over others. A good example will be Mobile App such as what's App and software like Microsoft Windows.

9. **(a)** Technical Barriers to Trade (TBT) which cover both food and non-food traded products refer to mandatory 'Standards and Technical Regulations' that define the specific characteristics that a product should have, such as its size, shape, design,

labelling / marking / packaging, functionality or performance and production methods, excluding measures covered by the SPS Agreement. The specific procedures used to check whether a product is really conforming to these requirements (conformity assessment procedures e.g. testing, inspection and certification) are also covered in TBT. This involves compulsory quality, quantity and price control of goods before shipment from the exporting country.

Just as SPS, TBT measures are standards-based measures that countries use to protect their consumers and preserve natural resources, but these can also be used effectively as obstacles to imports or to discriminate against imports and protect domestic products. Altering products and production processes to comply with the diverse requirements in export markets may be either impossible for the exporting country or would obviously raise costs, hurting the competitiveness of the exporting country. Some examples of TBT are: food laws, quality standards, industrial standards, organic certification, eco-labelling, and marketing and label requirements.

(b) An export duty tax is a tax collected on exported goods and may be either specific or ad valorem. The effect of an export tax is to raise the price of the good and to decrease exports. Since an export tax reduces exports and increases domestic supply, it also reduces domestic prices and leads to higher domestic consumption.

10. (a) Arbitrage refers to the practice of making risk-less profits by intelligently exploiting price differences of an asset at different dealing places. On account of arbitrage, regardless of physical location, at any given moment, all markets tend to have the same exchange rate for a given currency.

(b) There are two types of transactions in a forex market; current transactions which are carried out in the spot market and future transactions involving contracts to buy or sell currencies for future delivery which are carried out in forward and futures markets.