FINANCIAL MANAGEMENT AND BUSINESS DATA ANALYTICS

Time Allowed: 3 Hours Full Marks: 100

The figures in the margin on the right side indicate full marks.

SECTION – A (Compulsory)

1. Choose the correct option from the four alternatives given: [15 × 2 = 30]

(i) How long it will take ₹ 60,000 to double at a compound rate of 12% per annum?

A. 5 years
B. 6 years
C. 7 years
D. 8 years

(ii) Relationship between annual effective rate of interest and annual nominal rate of interest is, if frequency of compounding is more than 1:

A. Effective Rate < Nominal rate
B. Effective Rate > Nominal rate
C. Effective Rate = Nominal rate
D. None of the above

(iii) Risk of two securities having different expected return can be compared with:

A. standard deviation of securities
B. variance of securities
C. coefficient of variation
D. mean

(iv) Prime duty of a merchant banker is:

A. Maintaining records of clients
B. Giving loans to clients
C. Working as a Capital Market Intermediary
D. None of the above

(v) The Term short selling means

A. Selling shares less as need to sell in the contract.
B. Selling shares without owning them
C. Selling shares in anticipation of shares price rises.
D. Selling Shares without voting rights.

(vi) Inventory Turnover measures the relationship of inventory with:

A. Average sales
B. Cost of goods sold
C. Total purchases
D. Total assets

(vii) In the Dividend Yield Ratio the denominator is

A. Earnings Per Share
B. Dividend Per Share
C. Market Price Per Share
D. Book value Per Share

(viii) In Case of GDR issue the invitation to participate in the issue cannot be extended to _____ US investors.

A. Institutional
B. Retail
C. Private Equity
D. All the above

(ix) MJ Ltd. has issued 5000, 10% Debentures of ₹ 100 each. The rate of inflation is 6%. Calculate the real cost of debt.

A. 3.77%
B. 3.90%
C. 4.10%
D. 4.57%

(x) If the cost of the project is ₹22,84,000, the useful life is 5 years and the annuity is ₹8,00,000, then the Pay- Back Period is:

A. 3 years
B. 2 years 11 months
C. 2 years 9 months
D. 2 years 8 months

(xi) Evaluation of Capital Budgeting proposals is based on Cash Flows because:

A. Cash Flows are easy to calculate
B. Cash Flows are suggested by SEBI
C. Cash is more important than profit
D. Cash Flows are suggested by RBI

(xii) On the basis of _____, working capital is classified as gross working capital and net working capital.

A. concept
B. time
C. future
D. work

(xiii) If the Annual demand of raw materials is 40,000 units, the price per unit is ₹ 2, the ordering cost per order is ₹ 1,000 and the carrying cost percentage of average inventory is 10%, then the number of orders based on EOQ will be:

A. 3 orders
B. 2 orders
C. 1 order
D. 4 orders

(xiv) The abbreviation of NLP is

A. National Language Processing
B. Natural Language Processing
C. National Linear Processing
D. Natural Linear Processing

(xv) A scatter plot displays several unique data points _____.

A. on a single graph
B. on two different graphs
C. on four different graphs
D. none of the above

Answer:

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)
B (72/ 12)	B	C	C	B	B	C	B	A [(1.10/ 1.06) -1]	B (2284000/ 800000)	C	A	B	B	A

Section – B

(Answer any 5 questions out of 7 questions given. Each question carries 14 Marks) [5 × 14 = 70]

2. (a) Distinguish between the Primary Market and Secondary Market in the context of capital market. [7]

(b) Describe Descriptive Analytics? Explain the information revealed by Descriptive Analytics. [7]

Answer:

(a) The differences between Primary Market and Secondary Market are as follows:

	Primary Capital Market	**Secondary Capital Market**
Nature of Securities	It deals with new securities, i.e. securities which were not previously avail-able, and are offered for the first time tothe investors.	It is a market for old securities which have been issued already and granted stock exchange quotation.

	Primary Capital Market	Secondary Capital Market
Sale/Purchase	Securities are acquired from issuing companies themselves.	Securities are purchased and sold by the investors without any involvement of the companies.
Basis	Primary Market	Secondary Market
Nature of Financing	It provides funds to new enterprises & also for expansion and diversification of the existing one and its contribution to company financing is direct.	It does not supply additional funds to company since the company is not involved in transaction.
Liquidity	It does not lend any liquidity to the securities.	The secondary market provides facilities for the continuous purchase and sale of securities, thus lending liquidity and marketability to the securities.
Organisational difference	It is not rooted in any particular spot and has no geographical existence. it has neither any tangible form nor any administrative organisational set up.	Secondary markets have physical existence in the form of stock exchange and are located in a particular geographical area having an administrative organisation.
Requirement	Helps in creating new capital.	Helps in maintenance of existing capital.
Volume	Volume of transaction is low as compared to secondary market.	Volume of transaction is high as compared to primary market.

(b) Descriptive analytics is a frequently employed style of data analysis in which historical data is collected, organised, and presented in a readily digestible format. Descriptive analytics focuses exclusively on what has already occurred in an organisation and, unlike other types of analysis, does not utilise its results to draw inferences or make forecasts. Rather, descriptive analytics serves as a basic starting point to inform or prepare data for subsequent analysis.

In general, descriptive analytics is the simplest kind of data analytics, since it employs simple mathematical and statistical methods, such as arithmetic, averages, and percentage changes, rather of the complicated computations required for predictive and prescriptive analytics. With the use of visual tools such as line graphs, pie charts, and bar charts to communicate data, descriptive analytics can and should be readily understood by a broad corporate audience.

Information disclosed by Descriptive Analytics:

An organisation uses descriptive analytics regularly in its day-to-day operations. Examples of descriptive analytics that give a historical overview of an organization's activities include company reports on inventory, workflow, sales, and revenue. These types of reports collect data that can be readily aggregated and utilised to provide snapshots of an organization's activities.

Social analytics are virtually always a type of descriptive analytics. The number of followers, likes, and posts may be utilised to calculate, for example, the average number of replies per post, page visits, and response time. Facebook and Instagram comments are additional instances of descriptive analytics that may be utilised to better comprehend user sentiments.

However, descriptive analytics does not seek to go beyond the surface data and analysis; extra inquiry falls outside the scope of descriptive analytics, and conclusions and predictions are not derived from descriptive analysis. Nevertheless, this research can show patterns and significance by comparing historical data. An annual income report, for instance, may look financially encouraging until it is compared against the same report from past years, which reveals a declining trend.

3. (a) The capital structure of X Ltd. is given below:

Particulars	₹ in lakh
Equity share capital (₹100 each)	40.00
12% Preference share capital (₹100 each)	20.00
15% Debentures	16.00
16% Long term loan from bank	14.00
Profit after tax @40%	12.00

Proposed equity dividend is 20%
Calculate (i) Interest Coverage Ratio (ii) Preference Dividend Coverage Ratio (iii) Equity dividend coverage ratio. **[7]**

(b) From the following summary of cash account of Y Ltd. for the year ended 31.03.2025, calculate Cash Flow from Operating Activities using Direct Method and prepare Cash Flow Statement.

Particulars	₹	Particulars	₹
To Balance b/d	10,00,000	By Cash Purchase	10,40,000
To Cash Sales	12,00,000	By Paid to creditors	11,52,000
To Collection from debtors	12,80,000	By Rent paid	4,00,000
To Dividend received	16,000	By Administrative Exp.	2,00,000
To Bank Loan	12,00,000	By Income Tax	2,40,000
To Proceeds from Sale of Investment		By Purchase of Investment	7,20,000
To Trade Commission	6,40,000	By Repayment of Loan	8,00,000
	3,20,000	By Interest on Bank Loan	56,000
		By Balance c/d	10,48,000
	56,56,000		56,56,000

[7]

Answer:

(a) (i) Interest coverage ratio = PBIT/Annual Interest

Calculation of PBIT

Particulars	₹
PBT = PAT /(1-t) = 1200000/(1-0.40)	20,00,000
Add: Interest (1600000 × 15% + 1400000 × 16%)	4,64,000
PBIT	24,64,000

So, Interest Coverage Ratio = 24,64,000/ 4,64,000 = 5.31 times

(ii) Preference dividend coverage ratio
= PAT/Preference dividend
= 1200000 / (2000000 × 12%)
= 1200000 / 240000
= 5 times

(iii) Equity dividend coverage ratio
= (PAT – Preference Dividend)/Equity Dividend
= (1200000 – 240000)/(4000000 × 20%)
= 960000/800000
= 1.2 times

(b)

Cash Flow Statement
For the year ended on 31.03.2025

Particulars	₹	₹
Cash Flow from Operating Activities		
Cash Sales		12,00,000
Collection from Trade Receivables		12,80,000
Trade Commission received		3,20,000
		28,00,000
Less: Cash purchase	10,40,000	
Less: Paid to creditors	11,52,000	
Less: Payment of Rent	4,00,000	
Less: Payment of administration expenses	2,00,000	27,92,000
Cash Generated from Operations		8,000
Less: Payment of Income Tax		2,40,000
		(2,32,000)
Cash Flow from Investing Activities		
Sale of investment	6,40,000	
Dividend received	16,000	
Purchase of investment	(7,20,000)	

Particulars	₹	₹
Cash Flow from Financing Activities		(64,000)
Bank loan raised	12,00,000	
Repayment of loan	(8,00,000)	
Interest on bank loan	(56,000)	
		3,44,000
		48,000
Add: Opening Cash Balance		10,00,000
Closing Cash Balance		10,48,000

4. (a) Z Ltd. provides you the following Income Statement for the year ended 31st March 2022 and 2023.

Particular	31.03.2022 (₹)	31.03.2023(₹)
Net Sales	**12,50,000**	**15,60,000**
Less: Cost of Goods Sold	**5,50,000**	**7,60,000**
Gross Profit	**7,00,000**	**8,00,000**
Less: Other Operating Expenses	**2,00,000**	**2,60,000**
Operating Profit	**5,00,000**	**6,00,000**
Less: Interest on Long-term Debt	**50,000**	**60,000**
Profit Before Tax (PBT)	**4,50,000**	**5,40,000**

Prepare a Common Size Income Statement and comment on the financial performance of the company. [7]

(b) P Ltd. has the following capital structure:

Particulars	Book Value (₹)	Market Value (₹)
Equity Share Capital (50,000 shares of ₹ 10 each)	**5,00,000**	**9,00,000**
13% Preference Capital (1,000 shares of ₹ 100 each)	**1,00,000**	**90,000**
Reserve and Surplus	**3,00,000**	**--**
12% Debentures (3,000 debentures of ₹ 100 each)	**3,00,000**	**2,90,000**

The expected dividend per share is ₹ 1.40 and the dividend per share is expected to grow at a rate of 9 per cent forever. Preference shares are redeemable after 5 years at par whereas debentures are redeemable after 6 years at par. The tax rate for the company is 30 percent. Calculate the weighted average cost of capital for the existing capital structure using market value as weights. [7]

Answer:

(a)

Z Ltd.

Common Size Income Statement

For the year ended on 31st March 2022 and 2023

Particular	2022 (₹)	2023 (₹)
Net Sales	100%	100%
Less: Cost of Goods Sold $\left(\frac{Cost\ of\ Goods\ Sold}{Net\ Sales} x\ 100\right)$	44%	48.70%

Particular	2022 (₹)	2023 (₹)
Gross Profit $\left(\frac{Gross\ Profit}{Net\ Sales} x\ 100\right)$	56%	51.28%
Less: Other Operating Expenses $\left(\frac{Other\ Operating\ Expenses}{Net\ Sales} x\ 100\right)$	16%	16.67%
Operating Profit $\left(\frac{Operating\ Profit}{Net\ Sales} x\ 100\right)$	40%	38.46%
Less: Interest on Long-term Debt $\left(\frac{Interest}{Net\ Sales} x\ 100\right)$	4%	3.84%
Profit Before Tax (PBT) $\left(\frac{PBT}{Net\ Sales} x\ 100\right)$	36%	34.60%

Comments:

(i) The PBT to net sales has decreased from 36% in the year 2021-22 to 34.60% in the year 2022-23. It indicates that the profit earning capacity of the company has declined during the study period. This decline in the profitability of the company has been mainly due to significant increase in the cost of goods sold of the company.

(ii) The interest on long-term debt to net sales has declined from 4% in the 2021-22 to 3.84% in 2022-23. It implies that the financial burden of the company has reduced significantly during the study period, which has contributed to the marginally limit the fall of PBT.

(b) Calculation of Specific Cost of Capital:

1. Equity Share Capital:

$K_e = \frac{D_1}{P_0} + g = \frac{1.40}{18} + 0.09 = 16.77\%$

Note: The market price of the share, P_0 has been taken at = 9,00,000/50000 = ₹18

MV of ESC = 900000 x 500000/800000 = ₹5,62,500

MV of RS = 900000 x 300000/800000 = ₹3,37,500

2. As the Preference Shares are redeemable after 5 years, the cost of capital may be found as follows:

$K_p = \frac{PD+\frac{1}{N}(RV-MP)}{\frac{1}{2}(RV+MP)} = \frac{13+\frac{1}{5}(100-90)}{\frac{1}{2}(100+90)} = \frac{15}{95} = 15.8\%$

Note: The market price of preference share is ₹ 90,000/1,000 = ₹90.00.

3. As the debentures are redeemed after 6 years, the cost of capital may be found as follows:

$K_d = \frac{INT\ (1-t)+\frac{1}{N}(RV-MP)}{\frac{1}{2}(RV+MP)} = \frac{12\ (1-0.30)+\frac{1}{6}(100-96.67)}{\frac{1}{2}(100+96.67)} = 9.10\%$

Note: The market price of debentures is ₹ 2,90,000/3,000 = ₹96.67.

Calculation of WACC (Using MV Weights):

Sources	MV (₹)	Weights (W_i)	Specific Cost (K_i) (%)	Weighted Cost ($W_i K_i$) (%)
ESC	5,62,500	0.439	16.77	7.36
RS	3,37,500	0.264	16.77	4.43
PSC	90,000	0.070	15.8	1.11
Debentures	2,90,000	0.227	9.10	2.07
Total	12,80,000	1.0000		14.97

The weighted average cost of capital is 14.97%.

5. (a) **A firm proposes to market a cheaper variety of its existing brand to be sold for ₹20 per unit, estimated product-life being five years. The sales volume for the five years has been estimated to be 30,000 units for the first year, 40,000 units for each of the next two years and 20,000 units for each of the last two years. The variable cost p.u is ₹10. Production of the cheapest brand will entail an initial expenditure of ₹4,50,000 in purchasing and installing a new plant with estimated economic life of five years and scrap value of ₹50,000. The fixed cost of ₹2,00,000 per annum including depreciation on the plant on straight-line basis will be needed for producing and marketing the cheaper brand. Introduction of this cheaper variety is also likely to have an adverse impact on the demand of the existing dearer brand resulting in loss of contribution estimated at ₹20,000 per annum. Assuming cost of Capital to be 10% and marginal tax rate to be 40%, you are required to evaluate the proposal and give your reasoned recommendation as to its acceptance or rejection. The PV factors at 10% for five years are 0.909, 0.826, 0.751, 0.683 and 0.621.** **[7]**

(b) **Seema Limited is considering investing in a project requiring a capital outlay of ₹2,00,000. Forecast for annual income after depreciation but before tax is as follows:**

Year	₹
1	1,00,000
2	1,00,000
3	80,000
4	80,000
5	40,000

Depreciation may be taken as 20% of original cost and taxation at 50% of net income.

As a Cost and Management Accountant you are required to evaluate the project according to each of the following methods.

(i) **Pay-back Period method.**

(ii) **Rate of return (ARR) on original investment method.**

(iii) **Rate of return (ARR) on average investment method.**

(iv) **Discounted Payback Period method taking cost of capital as 10%.** **[7]**

Answer:

(a) **Calculation of CFAT**

Year	Sales (units)	CBDT (₹)	Depreciation (₹)	Taxable Profit (₹)	Tax @ 40%	Loss of Contribution (₹)	CFAT (₹)
	a	b	c	d	e	f	g = d – e + c - f
1	30,000	180000	80000	100000	40000	20000	120000
2	40,000	280000	80000	200000	80000	20000	180000
3	40,000	280000	80000	200000	80000	20000	180000
4	20,000	80000	80000	Nil	Nil	20000	60000
5	20,000	80000	80000	Nil	Nil	20000	110000*

*Including scrap value of ₹50000

Depreciation = (450000 – 50000)/5 = ₹80000 p.a.

Fixed cost excluding depreciation = 200000 – 80000 = ₹120000

CBDT = Sales Qty x (SPPU – VCPU)– FC excluding Depreciation

= Sales Qty x (20 – 10) - 120000

Calculation of NPV

Year	CFAT (₹)	PVIF @ 10%	PV of CF
1	120000	0.909	109080
2	180000	0.826	148680
3	180000	0.751	135180
4	60000	0.683	40980
5	110000*	0.621	68310
Total PVCF			502230
(-) Initial Investment			450000
NPV			52230

Since NPV of the project is positive, it may be recommended.

(b) (i) Pay-back Period Method

Statement of Net Cash Inflow

Year	Profit after depreciation (₹)	Tax (₹)	Profit before depreciation but after tax (₹)
1	1,00,000	50,000	90,000
2	1,00,000	50,000	90,000
3	80,000	40,000	80,000
4	80,000	40,000	80,000
5	40,000	20,000	60,000

Depreciation = 200000 x 20% = ₹40,000

Pay-back Period

₹ 1,80,000 is recovered in 2 years. The balance of ₹ 20,000 will be recovered in $\frac{20000}{80000}$ *or* 0.25 year.

Hence, pay-back period is 2.25 years

(ii) Rate of Return on Original Investment Method

Years	Net profit after tax and depreciation (₹)
1	50,000
2	50,000
3	40,000
4	40,000
5	20,000
Total Return	**2,00,000**
Average Annual Return Rate of Return = $\frac{40000}{200000}\times 100$ = 20%	= 200000/5 = 40,000

(iii) Rate of Return on Average Investment Method

ARR = $\frac{40000}{100000}$x100 = 40%

(iv) Discounted Payback Period Method

Year	Net profit before dep. but after tax (₹)	Discount Factor @ 10%	Present Value (₹)	Cumulative PV (₹)
1	90,000	0.909	81,810	81810
2	90,000	0.826	74,340	156150
3	80,000	0.751	60,080	216230
4	80,000	0.683	54,640	270870
5	60,000	0.621	37,260	308130

DPBP = 2 + (200000 – 156150)/(216230 – 156150) = 2.73 years

6. (a) From the following information prepare a statement showing the Estimated Working Capital Requirements:

Projected annual sales	**36,000 units**
Analysis of sales	**₹**
Raw materials	**6 per unit**
Labour	**4 per unit**
Overhead	**3 per unit**
Profit	**2 per unit**
Selling Price	**15 per unit**

Additional information:

(i) Raw materials in stock 1 month
(ii) Production process 2 months
(iii) Finished goods in store 3 months
(iv) Credit allowed to debtor 4 months
(v) Credit allowed by suppliers 2 months
(vi) Monthly wages and expenses are paid twice on 1st and 16th at each month.
(vii) Production is carried on evenly during the year and expenses and wages accrue similarly.
(viii) Cash is to be kept at 10% of the net working capital. **[7]**

(b) A. Ltd. has a current annual sales of level of 20,000 units at ₹ 300 per unit. The variable cost per unit is ₹ 200 per unit and the fixed costs amount to ₹ 6,00,000 per annum. The present credit allowed by the company is one month. The company is considering a proposal to increase the credit period to two months and three months and has made the following estimates:

Credit Policy	Existing	Proposed	
	1 Month	2 Months	3 Months
Increase in sales	--	15%	30%
% of Bad debts	1%	3%	5%

There will be increase in fixed cost by ₹ 1,00,000 on account of increase in sales beyond 15 per cent of present level. The company plans on a pre-tax return of 20 per cent on investment in receivables. Prepare the policy to be accepted. **[7]**

Answer:

(a) Projected annual sales = 36,000 units

So, Sales per month = 36,000/12 = 3000 units

Statement of Cost

	Total (₹)
Raw materials (3000 × 6)	18,000
Labour (3000 × 4)	12,000
Overhead (3000 × 3)	9,000
Profit (3000 × 2)	6,000
Selling price (3000 × 15)	45,000

Working Note 1:

Since wages and expenses accrue similarly and they are paid at 1st and 16th of every month, so lag period in payment of wages and overheads in respect of W.I.P = 2/2 = 1 month

Statement Showing Working Capital Requirement

	Monthly Average Cost (₹)	Net Block (months)	Amount (₹)	Amount (₹)
A. Current Assets				
Stock: (i) Raw materials	18,000	1		18,000
(ii) Work-in-progress:				
Raw Materials	18,000	2	36,000	
Wages	12,000	1	12,000	
Overhead	9,000	1	9,000	57,000
(iii) Finished Goods:				
Raw Materials	18,000	3	54,000	
Wages	12,000	3	36,000	
Overhead	9,000	3	27,000	1,17,000
				1,92,000
(iv) Debtors:				
Raw Materials	18,000	4	72,000	
Wages	12,000	4	48,000	
Overhead	9,000	4	36,000	
Profit	6,000	4	24,000	1,80,000
Total Current Assets				3,72,000

	Monthly Average Cost (₹)	Net Block (months)	Amount (₹)	Amount (₹)
B. Current Liabilities				
Creditors for materials	18,000	2	36,000	
Outstanding wages	12,000	1/2	6,000	
Outstanding expenses	9,000	1/2	4,500	
				46,500
Net Working Capital requirement (A-B)				3,25,500
Add: cash in hand (10% of NWC)				32,550
Working Capital requirement				3,58,050

(b)

Evaluation of Alternative Credit Policies

	Existing	Proposal I	Proposal II
Credit Period	1 month	2 months	3 months
No. of Units	20000	23000	26000
Sales @ ₹ 300 per unit (₹)	60,00,000	69,00,000	78,00,000
(–) Variable Cost @ ₹200 per unit	40,00,000	46,00,000	52,00,000
(–) Fixed Cost	6,00,000	6,00,000	7,00,000
Surplus	14,00,000	17,00,000	19,00,000
(-) Bad Debts 1/3/5% of Sales	60,000	2,07,000	3,90,000
Profit (A)	13,40,000	14,93,000	15,10,000
Total Cost	46,00,000	52,00,000	59,00,000
Average Debtors at Cost	3,83,333	8,66,667	14,75,000
Interest Cost @ 20% (B)	76,667	1,73,333	2,95,000
Net Profit (A – B)	12,63,333	13,19,667	12,15,000
Incremental Profit	---	56,334	(-) 48,333

Since the incremental profit is higher under Proposal I, it should be accepted.

7. (a) X Ltd. belongs to a risk class for which the appropriate price-earnings ratio is 10. It currently has 25,000 equity shares selling at ₹50 each. The company is contemplating the declaration of ₹4 as dividend per share at the end of the current financial year which has just started. Given the assumption of Modigliani and Miller, answer the following:

(i) Calculate the price of the share at the end of the year if dividend is not declared and if dividend is declared?

(ii) Assume that the firm paying the dividend has net profit of ₹2,50,000 and makes investment of ₹5,00,000 during the period, Calculate how many new shares must be issued?

(iii) If the firm decides not to pay any dividend, Calculate how many new shares will it require to issue? [7]

(b) B Ltd. has sales of ₹20,00,000, variable cost of ₹14,00,000 and fixed costs of ₹4,00,000 and debt of ₹10,00,000 at 10% rate of interest. Calculate the values of operating, financial and combined leverage? If the firm wants to double its earnings before interest and tax (EBIT), how much of a rise in sales would be needed on a percentage basis? [7]

Answer:

(a) (a) Given, Price-Earnings ratio (P/E) = 10

So, Cost of Capital (k) = 1/ Price-earnings ratio = 1/ 10 = 0.10 = 10%

Current market price per share (P_0) = ₹50

We know that, as per M-M, current market price per share (P_0) = $\frac{D_1+P_1}{1+k}$

where, D_1 = Dividend per share at the end of the year, P_1 = Price (Terminal value) per share at the end of the year

(i) Price per share at the end of the year when dividend is not declared (i.e. $D_1 = 0$):

Conditionally, $50 = \frac{0+P_1}{1+0.10}$ or, $P_1 = 55$

Price per share at the end of the year when dividend is declared (i.e. D_1 = ₹4):

Conditionally, $50 = \frac{4+P_1}{1+0.10}$ or, $P_1 = 51$

(b) New shares to be issued when dividend is declared:

Given, I = amount of investment required = ₹5,00,000

E = Earnings i.e. net profit available = ₹2,50,000

n = existing number of shares = 25,000

m = Number of new shares to be issued

Conditionally, $mP_1 = I – (E – nD_1)$

m x 51 = 5,00,000 – (2,50,000 – 25,000 x 4)

m = 6,863 (approximately)

(c) New shares to be issued when dividend is not declared:

Here, $D_1 = 0$

Conditionally, $mP_1 = I – (E – nD1)$

m x 55 = 5,00,000 – (2,50,000 – 25,000 x 0)

m = 4,545 (approximately)

(b)

Statement of Profitability

Particulars	₹
Sales	20,00,000
(-) Variable cost	14,00,000
Contribution	6,00,000
(-) Fixed cost	4,00,000
EBIT	2,00,000
(-) Interest @ 10% on ₹10,00,000	1,00,000
EBT	1,00,000

Operating Leverage = Contribution/EBIT = 600000/200000 = 3
Financial Leverage = EBIT/EBT = 200000/100000 = 2
Combined Leverage = Contribution/EBT = 6
By definition, degree of operating leverage
= Percentage change in EBIT/ Percentage change in sales

Since, degree of operating leverage = 3, it implies that for 1% increase in sales, EBIT increases by 3%.

So, for 100% increase in EBIT, sales must increase by 100/3 = $33\frac{1}{3}$ %.
Thus, required increase in sales = 2000000 x 33.33% = ₹6,66,667

8. (a) Discuss the six core steps that may turn the data into user friendly information. **[7]**

(b) Discuss the various techniques of data mining. **[7]**

Answer:

(a) To make the data turn into user friendly information, it should go through six core steps:

1. **Collection of data:** The collection of data may be done with standardized systems in place. Appropriate software and hardware may be used for this purpose. Appointment of trained staff also plays an important role in collecting accurate and relevant data.
2. **Organising the data:** The raw data needs to be organized in an appropriate manner to generate relevant information. The data may be grouped, arranged in a manner that create useful information for the target user groups.
3. **Data processing:** At this step, data needs to be cleaned to remove the unnecessary elements. If any data point is missing or not available, that also need to be addressed. The options available for presentation format for the data also need to be decided.
4. **Integration of data:** Data integration is the process of combining data from various sources into a single, unified form. This step includes creation of data network sources, a master server and users accessing the data from master server. Data integration eventually enables the analytics tools to produce effective, actionable business intelligence.
5. **Data reporting:** Data reporting stage involves translating the data into a consumable format to make it accessible by the users. For example, for a business firm, they should be able to provide summarized financial information e.g. revenue, net profit etc. The objective is, a user, who wants to understand the financial position of the company should get the relevant and accurate information.
6. **Data utilization:** At this ultimate step, data is being utilized to back corporate activities and enhance operational efficiencies and productivity for the growth of business. This makes the corporate decision making really 'data driven'.

(b) Using various methods and approaches, data mining transforms vast quantities of data into valuable information. Here are a few of the most prevalent:

(i) Association rules:

An association rule is a rule-based technique for discovering associations between variables inside a given dataset. These methodologies are commonly employed for market basket analysis, enabling businesses to better comprehend the linkages between various items. Understanding client consumption patterns helps organisations to create more effective cross-selling tactics and recommendation engines.

(ii) Neural Networks:

Primarily utilised for deep learning algorithms, neural networks replicate the interconnection of the human brain through layers of nodes to process training data. Every node has inputs, weights, a bias (or threshold), as well as an output. If the output value exceeds a predetermined threshold, the node "fires" and passes data to the subsequent network layer. Neural networks acquire this mapping function by supervised learning and gradient descent, changing based on the loss function. When the cost function is zero or close to it, we may have confidence in the model's ability to produce the correct answer.

(iii) Decision tree:

Using classification or regression algorithms, this data mining methodology classifies or predicts likely outcomes based on a collection of decisions. As its name implies, it employs a tree-like representation to depict the potential results of these actions.

(iv) K-nearest neighbour:

K-nearest neighbour, often known as the KNN algorithm, classifies data points depending on their closeness to and correlation with other accessible data. This technique assumes that comparable data points exist in close proximity to one another. Consequently, it attempts to measure the distance between data points, often by Euclidean distance, and then assigns some on the most common category or average.