



**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:**

**[15 x 2 = 30]**

- (i) \_\_\_\_\_ represents that portion of Total Risk which is attributable to factors that affect the market as a whole.
- (a) Systematic Risk
  - (b) Unsystematic Risk
  - (c) Purchasing Power Risk
  - (d) None of the above
- (ii) If the rate of interest is 12%, what are the doubling periods as per the rule 72 and the rule of 69 respectively?
- (a) 5 Years and 5.2 Years
  - (b) 5.8 Years and 5.3 Years
  - (c) 6 Years and 6.1 Years
  - (d) 6.5 Years and 6.6 Years
- (iii) The first computerised online stock exchange in India was:
- (a) NSE
  - (b) OTCEI
  - (c) BSE
  - (d) MCX
- (iv) What is the value of a levered firm L Ltd. if it has the same EBIT as an unlevered firm U Ltd., (with value of ₹ 700 lakh), has a debt of ₹ 200 lakh, tax rate is 35% under M-M approach?
- (a) ₹ 770 Lakh
  - (b) ₹ 500 Lakh
  - (c) ₹ 630 Lakh
  - (d) ₹ 900 Lakh
- (v) Higher net working capital leads to \_\_\_\_\_ (higher / lower) liquidity and higher profitability.
- (a) Higher
  - (b) Lower
  - (c) No Changes in
  - (d) None of the above

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- (vi) T Ltd. requires ₹ 3 million in cash for meeting its transaction needs over the next 6 months, its planning horizon for liquidity decision. The company currently has the amount in the form of marketable securities. The cash payment will be made evenly over the six month period. T Ltd. earns 12% annual yield on its marketable securities. Conversion and marketable securities into cash entails a fixed cost of ₹ 1000 per transaction. What will be the optimal conversion size as per Baumol model of cash management?
- (a) ₹ 315,628  
(b) ₹ 316,228  
(c) ₹ 317,678  
(d) ₹ 318,426
- (vii) SISFS stands for \_\_\_\_\_.
- (a) Start-up India Seed Fund Strategy  
(b) Start-up India Seed Financial Strategy  
(c) Start-up India Seed Financial Scheme  
(d) Start-up India Seed Fund Scheme
- (viii) The following information is given for a project:  
Annual cash inflow ₹ 8,00,000, Useful life 4 years. Payback period 2.855 years.  
The cost of the project would be -
- (a) ₹ 22,80,000  
(b) ₹ 22,84,000  
(c) ₹ 22,86,000  
(d) ₹ 22,87,800
- (ix) Every debt instrument has \_\_\_\_\_.
- (a) A face value  
(b) A maturity value  
(c) A face value as well as a maturity value  
(d) Liquidity value
- (x) If the current ratio is 2.4:1 and working capital is ₹ 25,20,000, find the amount of current assets and current liabilities.
- (a) Current Assets ₹ 43,20,000 and Current Liabilities ₹ 18,00,000  
(b) Current Assets ₹ 44,00,000 and Current Liabilities ₹ 18,50,000  
(c) Current Assets ₹ 45,50,000 and Current Liabilities ₹ 19,00,000  
(d) Current Assets ₹ 46,60,000 and Current Liabilities ₹ 19,30,000
- (xi) A project has a 10% discounted payback of 2 years with annual after-tax cash inflows commencing from year end 2 to 4 of ₹400 lakh. How much would have been the initial cash outlay which was fully made at the beginning of year 1?
- (a) ₹ 400 lakh  
(b) ₹ 422 lakh  
(c) ₹ 452 lakh

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(d) ₹ 497.20 lakh

(xii) XBRL is the abbreviated form of:

- (a) eXtensible Business Reporting Language
- (b) eXtensive Business Reporting Language
- (c) eXtended Business Reporting Language
- (d) eXtensive Business Reporting Language

(xiii) The geometric distribution is a discrete distribution that assesses:

- (a) the probability of the occurrence of the first success
- (b) the probability of the occurrence of the second success
- (c) the probability of the occurrence of the third success
- (d) the probability of the occurrence of the less success

(xiv) 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.

(xv) If a firm has a DOL of 2.8, it means:

- (a) If sales increase by 2.8%, the EBIT will increase by 1%
- (b) If EBIT increase by 2.896, the EPS will increase by 1%
- (c) If sales rise by 1%, EBIT will rise by 2.8%
- (d) None of the above.

**Answers:**

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
a	c	b	a	a	b	d	b	c	a
(xi)	(xii)	(xiii)	(xiv)	(xv)					
c	a	a	a	c					

**SECTION – B**

(Answer any five questions out of seven questions given. Each question carries 14 Marks.)

[5x14=70]

2. (a) Explain the Registration requirement of NBFCs'. Describe what is residuary Non-Banking Company (RNBC). [7]
- (b) Describe the data mining. Explain the applications of data mining techniques in finance and management. [7]



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**Answer:**

**(a) Registration requirement of NBFCs:**

In terms of Section 45-IA of the RBI Act, 1934, no Non-banking Financial Company can commence or carry-on business of a non-banking financial institution without obtaining a certificate of registration from the Bank and without having a Net Owned Funds of ₹25 lakhs (rupees two crores since April 1999). However, in terms of the powers given to the Bank, to obviate dual regulation, certain categories of NBFCs which are regulated by other regulators are exempted from the requirement of registration with RBI viz. Venture Capital Fund/Merchant Banking companies/Stock broking companies registered with SEBI, Insurance Company holding a valid Certificate of Registration issued by IRDA, Nidhi companies as notified under Section 620A of the Companies Act, 1956, Chit companies as defined in clause (b) of Section 2 of the Chit Funds Act, 1982, Housing Finance Companies regulated by National Housing Bank, Stock Exchange or a Mutual Benefit company.

**NBFCs- Exempted from Registration:**

Housing Finance Companies, Merchant Banking Companies, Stock Exchanges, Companies engaged in the business of stock-broking/sub-broking, Venture Capital Fund Companies, Nidhi Companies, Insurance companies and Chit Fund Companies are NBFCs but they have been exempted from the requirement of registration under Section 45-IA of the RBI Act, 1934 subject to certain conditions. Housing Finance Companies are regulated by National Housing Bank, Merchant Banker/Venture Capital Fund Company/stock-exchanges/stock brokers/sub-brokers are regulated by Securities and Exchange Board of India, and Insurance companies are regulated by Insurance Regulatory and Development Authority. Similarly, Chit Fund Companies are regulated by the respective State Governments and Nidhi Companies are regulated by Ministry of Corporate Affairs, Government of India.

It may also be mentioned that Mortgage Guarantee Companies have been notified as Non-Banking Financial Companies under Section 45 I(f)(iii) of the RBI Act, 1934.

**Residuary Non-Banking Company (RNBC):**

Residuary Non-Banking Company is a class of NBFC which is a company and has as its principal business, the receiving of deposits, under any scheme or arrangement or in any other manner and not being Investment, Asset Financing, Loan Company. These companies are required to maintain investments as per directions of RBI, in addition to liquid assets. The functioning of these companies is different from those of NBFCs in terms of method of mobilization of deposits and requirement of deployment of depositors' funds as per Directions. Besides, Prudential Norms Directions are applicable to these companies also.

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- (b) Data mining, also known as knowledge discovery in data (KDD), is the extraction of patterns and other useful information from massive data sets. Given the advancement of data warehousing technologies and the expansion of big data, the use of data mining techniques has advanced dramatically over the past two decades, supporting businesses in translating their raw data into meaningful information. Nevertheless, despite the fact that technology is always evolving to manage massive amounts of data, leaders continue to struggle with scalability and automation. Through smart data analytics, data mining has enhanced corporate decision making. The data mining techniques behind these investigations may be categorised into two primary purposes: describing the target dataset or predicting results using machine learning algorithms. These strategies are used to organise and filter data, bringing to the surface the most relevant information, including fraud detection, user habits, bottlenecks, and even security breaches.

The widespread use of data mining techniques by business intelligence and data analytics teams enables them to harvest insights for their organisations and industries. Utilizing data mining techniques, hidden patterns and future trends and behaviours in financial markets may be predicted. Typically, sophisticated statistical, mathematical, and artificial intelligence approaches are necessary for data mining, particularly for high-frequency financial data. Among the data mining applications are:

- (i) Detecting money laundering and other financial crimes:

Money laundering is the illegal conversion of black money to white money. In today's society, data mining techniques have advanced to the point where they are deemed suitable for detecting money laundering. The data mining methodology provides a mechanism for bank customers to detect or verify the detection of the anti-money laundering impact.

- (ii) Prediction of loan repayment and customer credit policy analysis:

Loan Distribution is the core business function of every bank. The loan Prediction system automatically computes the size of the characteristics it employs and examines data pertaining to its size. Consequently, data mining aids in the management of all critical data and massive databases by utilising its models.

- (iii) Target marketing:

Together, data mining and marketing work to target a certain market, and they also assist and determine market decisions. With data mining, it is possible to keep earnings, margins, etc. and determine which product is optimal for various types of customers.

- (iv) Design and construction of data warehouses:

The business is able to retrieve or move the data into several huge data warehouses, allowing a vast volume of data to be correctly and reliably evaluated with the aid

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of various data mining methodologies and techniques. It also examines a vast number of transactions.

3. (a) The following is the summary of Financial Ratios and form of a Textile Company having a sale of ₹ 32 lakh:

Sales to net worth (times)	2.3
Current debt to net worth (%)	42
Total debt to net worth (%)	75
Current ratio(times)	2.9
Net sales to inventory (times)	4.7
Fixed asset to net worth (%)	53.2

**Performa Balance Sheet (Amount in ₹)**

Net worth	-----	Fixed assets	-----
Long –term debt	-----	Cash	-----
Current debt	-----	Stock	-----
		Sundry debtors	5,68,889
	-----		-----

Calculate the missing amount of Performa balance sheet.

[7]

- (b) The following is the Balance Sheet of Gama Limited for the year ending March 31, 2023 and March 31, 2024:

**Balance Sheet as on 31<sup>st</sup> March**

Particulars	2023 (₹)	2024 (₹)
<b>Capital and Liabilities:</b>		
Share Capital	6,75,000	7,87,500
General Reserves	2,25,000	2,81,250
Capital Reserve (Profit on Sale of Investment)	- 1,12,500	11,250
Profit & Loss Account	3,37,500	2,25,000
15% Debentures	11,250	2,25,000
Accrued Expenses	1,80,000	13,500
Creditors	33,750	2,81,250
Provision for Dividends	78,750	38,250
Provision for Taxation		85,500
<b>Total</b>	<b>16,53,750</b>	<b>19,48,500</b>
<b>Assets:</b>		
Fixed Assets	11,25,000	13,50,000
Less: Accumulated depreciation	2,25,000	2,81,250
<b>Net Fixed Assets</b>	<b>9,00,000</b>	<b>10,68,750</b>



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Long – Term Investments (at cost)	2,02,500	2,02,500
Stock (at cost)	2,25,000	3,03,750
Debtors (net of provision for doubtful debts of ₹ 45,000 and ₹ 56,250 respectively for 2023 and 2024 respectively)	2,53,125	2,75,625
Bills receivables	45,000	73,125
Prepaid Expenses	11,250	13,500
Miscellaneous Expenditure	16,875	11,250
Total	16,53,750	19,48,500

## Additional Information:

1. During the year 2023-24, fixed assets with a net book value of ₹ 11,250 (accumulated depreciation, ₹ 33,750) was sold for ₹ 9,000.
2. During the year 2023-24, Investments costing ₹ 90,000 were sold, and also Investments costing ₹ 90,000 were purchased.
3. Debentures were retired at a Premium of 10%.
4. Tax of ₹ 61,875 was paid for 2022-23.
5. During the year 2023-24, bad debts of ₹ 15,750 were written off against the provision for Doubtful Debt account.
6. The proposed dividend for 2022-23 was paid in 2023-24.

Prepare a Funds Flow Statement (Statement of changes in Financial Position on working capital basis) for the year ended March 31, 2024. [7]

## Answer:

- (a) Performa Balance Sheet of the Textile Company as on .....

Liabilities	Amount (₹)	Assets	Amount (₹)
Net worth	13,91,304	Fixed assets	7,40,173
Long –term debt	4,59,130	Cash	4,44,869
Current debt	5,84,348	Stock	6,80,851
		Sundry debtors	568889
	24,34,782		24,34,782

## Working Notes:

1. Net worth = ₹ 32,00,000 ÷ 2.3 = ₹ 13,91,304
2. Current debt = (₹ 13,91,304/100) x 42 = ₹ 5,84,348
3. Total debt = (₹ 13,91,304/100) x 75 = ₹ 10,43,478
4. Long-term debt = ₹ 10,43,478 – ₹ 5,84,348 = ₹ 4,59,130
5. Fixed assets = (₹ 13,91,304/1,000) x 532 = ₹ 7,40,173.
6. Current assets = ₹ 5,84,348 x 2.9 = ₹ 16,94,609.
7. Inventory = ₹ 32,00,000 ÷ 4.7 = ₹ 6,80,851.
8. Cash = ₹ 16,94,609 - (₹ 6,80,851 + ₹ 5,68,889) = ₹ 4,44,869





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(b)

In the books of Gama Ltd.

Funds Flow Statement for the year ended March 31, 2024

Sources of Fund	Amount (₹)	Application of Funds	Amount (₹)
Increase in Share Capital	1,12,500	Debenture Redemption	1,12,500
Sale of Assets	9,000	Redemption Premium	11,250
Fund from Operations	3,84,750	Tax paid	61,875
Sale of Investment	1,01,250	Dividend paid	33,750
		Increase in Working Capital	28,125
		Purchase of Fixed Assets	2,70,000
		Purchase of Investment	90,000
	6,07,500		6,07,500

Working notes:

Statement showing Funds from Operations -

Particulars	Amount (₹)	Amount (₹)
Net Profit [2,25,000 – 1,12,500]		1,12,500
Add: Transfer to General Reserve	56,250	
Loss on sale of fixed assets	2,250	
Premium on Redemption of Debentures	11,250	
Provision for Tax	68,625	
Provision for Dividend	38,250	
Depreciation	90,000	
Misc. Expenses. write off	5,625	2,72,250
Funds from Operations		3,84,750

Statement showing changes in Working Capital -

Particulars	₹	
	2023	2024
Current Assets		
Stock	2,25,000	3,03,750
Debtors	2,53,125	2,75,625
Bills Receivables	45,000	73,125
Prepaid Expenses	11,250	13,500
Total Current Assets (A)	5,34,375	6,66,000
Current Liabilities		
Accrued Expenses	11,250	13,500
Creditors	1,80,000	2,81,250
Total Current Liabilities (B)	1,91,250	2,94,750



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Working Capital (A) – (B)	3,43,125	3,71,250
Increase in Working Capital		28,125

Dr. Provision for Doubtful Debt A/c Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Bad debts	15,750	By Balance b/d	45,000
To Balance c/d	56,250	By P & L A/c	27,000
	72,000		72,000

Dr. Provision for Dividends A/c Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Dividend paid	33,750	By Balance b/d	33,750
To Balance c/d	38,250	By P & L A/c	38,250
	72,000		72,000

Dr. Provision for Tax A/c Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Tax paid	61,875	By Balance B/d	78,750
To Balance c/d	85,500	By P & L A/c	68,625
	1,47,375		1,47,375

Dr. Accumulated Depreciation A/c Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Asset sold	33,750	By Balance b/d	2,25,000
To Balance c/d	2,81,250	By P & L A/c	90,000
	3,15,000		3,15,000

Dr. Fixed Assets A/c Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	11,25,000	By Depreciation	33,750
To Bank	2,70,000	By Bank	9,000
		By P & L	2,250
		By Balance c/d	13,50,000
	13,95,000		13,95,000

4. (a) The following are the Balance Sheets of Maharaj Ltd. as on 31.03.23 and 31.03.24:

Particulars	31.03.23 (₹)	31.03.24 (₹)
<b>Current Assets:</b>		
Cash and Bank Balance	23,600	2,000
Debtors	41,800	38,000
Inventory	32,000	26,000



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Other Current Assets	6,400	2,600
Total Current Assets (A)	1,03,800	68,600
Fixed Assets :		
Land and Building	54,000	34,000
Plant and Machinery	62,000	1,57,200
Furniture	5,800	9,600
Total Fixed Assets (B)	1,21,800	2,00,800
Long-term Investment (C)	9,200	11,800
Total Assets (A + B + C)	2,34,800	2,81,200
Current Liabilities (D)	52,400	25,400
Long-term Debt (E)	40,000	65,000
Owners' Equity:		
Equity Share Capital	80,000	1,20,000
Reserve and Surplus	62,400	70,800
Total Owners' Equity (F)	1,42,400	1,90,800
Total Liabilities and Capital (D + E + F)	2,34,800	2,81,200

Prepare Comparative Balance Sheets and study its financial position. [7]

- (b) Jamia Ltd. has on its book the following amounts and specific costs of each type of capital:

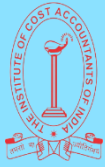
Type of capital	Book value (₹)	Market value (₹)	Specific cost (%)
Debt	8,00,000	7,60,000	5
Preference	2,00,000	2,20,000	8
Equity	12,00,000	18,00,000	15
Retained earnings	4,00,000	6,00,000	13
	26,00,000	33,80,000	

Calculate the weighted average cost of capital using book and market value weights. [7]

Answer:

- (a) Comparative Balance Sheets of Maharaj Ltd. as on 31.03.2023 and 31.03.2024

Particulars	31.03.23 (₹)	31.03.24 (₹)	Amount of increase (+) or decrease (-) (₹)	Percentage increase (+) or decrease (-) %
Current Assets:				
Cash and Bank Balance	23,600	2,000	(-)21,600	(-) 91.5
Debtors	41,800	38,000	(-) 3,800	(-) 9.1
Inventory	32,000	26,000	(-) 6,000	(-) 18.8
Other Current Assets	6,400	2,600	(-) 3,800	(-) 59.4



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Total Current Assets(A)	1,03,800	68,600	(-) 35,200	(-) 33.9
Fixed Assets:				
Land and Building	54,000	34,000	(-) 20,000	(-) 37
Plant and Machinery	62,000	1,57,200	(+) 95,200	(+) 153.5
Furniture	5,800	9,600	(+) 3,800	(+) 65.5
Total Fixed Assets (B)	1,21,800	2,00,800	(+) 79,000	(+) 64.9
Long-term Investment (C)	9,200	11,800	(+) 2,600	(+) 28.3
Total Assets (A + B + C)	2,34,800	2,81,200	(+) 46,400	(+) 19.8
Current Liabilities (D)	52,400	25,400	(-) 27,000	(-) 51.5
Long-term Debt (E)	40,000	65,000	(+) 25,000	(+) 62.5
Owners' Equity:				
Equity Share Capital	80,000	1,20,000	(+) 40,000	(+) 50.0
Reserve and Surplus	62,400	70,800	(+) 8,400	(+) 13.5
Total Owner's Equity (F)	1,42,400	1,90,800	(+) 48,400	(+) 34
Total liabilities and capital (D + E + F)	2,34,800	2,81,200	(+) 46,400	(+) 19.8

**Interpretation of Results:**

Comparative balance sheet shows the balance of different assets and liabilities of two different periods of same company and shows absolute increase / decrease of each item in 2023-24 over 2022-23 and also shows the percentage change. Interpretations of these changes are as follows:

- (i) The current assets of Maharaj Ltd. have decreased by ₹ 35,200 in the year 2023-24 over 2022-23, whereas current liabilities have decrease by ₹ 27,000 only. But it has no adverse effect on short term liquidity or on current ratio because current assets have decreased by 33.9% and current liabilities have decreased by 51.5%.
- (ii) Cash and Bank balance have decreased by 91.5% during the study period. It implies an adverse cash position of the company. The company may face problem in meeting its short-term obligations.
- (iii) The long-term debt of the company has increased by 62.5%, whereas its owners' equity has improved by 34% only. It implies that the financial risk (in terms of dependency on outsiders and in terms of contractual obligation) associated with the company has increased significantly during the period under study.
- (iv) There has been a substantial increase in the fixed assets by the company. The fixed assets have increased by ₹ 79,000 (64.9%). This is mainly due to significant increase in the plant and machinery of the company.
- (v) The plant and machinery have increased by ₹ 95,200 (153.5%). It indicates a remarkable improvement in the production capacity of the company during the study period. Such cost of assets has financed by proprietors' fund and long-term loan raised. It indicates the long-term stability of the business.

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- (b) Determination of weighted average cost of capital using book value weights:

Type of capital	Book value (₹) (BV)	Specific costs (%) (K)	Total cost (₹) BV × K
Debt	8,00,000	5	40,000
Preference	2,00,000	8	16,000
Equity	12,00,000	15	1,80,000
Retained earnings	4,00,000	13	52,000
	26,00,000		2,88,000

$$K_0 = \text{Total cost} / \text{Total amount of capital} = 2,88,000 / 26,00,000 \times 100 = 11.07692\%$$

- Determination of weighted average cost of capital using market value weights:

Type of capital	Market value (₹) (MV)	Specific costs (%) (K)	Total cost (₹) MV × K
Debt	7,60,000	5	38,000
Preference	2,20,000	8	17,600
Equity	18,00,000	15	2,70,000
Retained earnings	6,00,000	13	78,000
	33,80,000		4,03,600

$$K_0 = \text{Total cost} / \text{Total amount of capital} = 4,03,600 / 33,80,000 \times 100 = 11.9408\%$$

The  $K_0$  based upon market value is greater than  $K_0$  upon book value because market value of equity fund is considerably larger than their book value and since these sources of long term funds have higher specific costs, the overall cost of capital increases. The weighted average cost of capital would be the same with both the book value weights and market value weights when there is no difference between the book value and the market value of securities used in raising the capital.

5. (a) A plastic manufacturer has under consideration the proposal of production of high quality plastic bowl. The necessary equipment to manufacture the bowl would cost ₹ 2 lakhs and would last 5 years. The tax relevant rate of depreciation is 20% on written down value. There is no other asset in the block. The expected salvage is ₹ 20,000. The bowl can be sold at ₹ 4 each. Regardless of the level of production, the manufacturer will incur cash cost ₹ 50,000 each year if the project is undertaken. The overhead costs allocated to this new line would be ₹ 10,000. The variable costs are estimated at ₹ 2 per bowl. The manufacturer estimates it will sell about 1,50,000 bowl per year ; the tax rate is 35% .



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Advice the management whether the proposed equipment should be purchased or not. Assume 20% cost of capital and additional working capital requirement, ₹1,00,000. [7]

- (b) A limited company is considering investing 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% on original cost and taxation at 50% of net income. You are required to evaluate the project according to each of the following methods:

1. Payback period method
2. Rate of return on original investment method
3. Rate of return on average investment method
4. Discounted cash flow method taking cost of capital as 10%
5. Net present value index method
6. Internal rate of return method.
7. Modified internal rate of return method. [7]

Answer:

- (a) Cash outflows

Cost of production equipment	₹ 2,00,000
Additional working capital requirement	₹ 1,00,000
	₹ 3,00,000

Determination of CFAT and NPV:

Particulars	Years				
	1	2	3	4	5
Sales revenue (1,50,000 × 4)	6,00,000	6,00,000	6,00,000	6,00,000	6,00,000
Less : Costs					
Variable costs (1,50,000×2)	3,00,000	3,00,000	3,00,000	3,00,000	3,00,000
Additional fixed Costs	50,000	50,000	50,000	50,000	50,000
Depreciation (D)	40,000	32,000	25,600	20,480	Nil
Earnings before Taxes	2,10,000	2,18,000	2,24,400	2,29,520	2,50,000



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Less : Taxes	73,500	76,300	78,540	80,332	87,500
Earning after taxes (EAT)	1,36,500	1,41,700	1,45,860	1,49,188	1,62,500
CFAT (EAT + D)	1,76,500	1,73,700	1,71,460	1,69,668	1,62,500
Add: Recovery of WC					1,00,000
Add: Salvage (SV)					20,000
Add: Tax benefit on short term capital loss (Note 1)					21,672
					3,04,172
Multiplied by PV factor	0.833	0.694	0.579	0.482	0.402
PV (CFAT × PV factor)	1,47,025	1,20,548	99,276	81,780	1,22,278
Total PV(t= 1-5)					5,70,907
Less: Cash Outflow					3,00,000
NPV					2,70,907

Note 1: {₹ 2,00,000-1,18,080 (accumulated depreciation) -₹ 20,000(SV)} × 0.35 = ₹ 21,672.

Note 2: As the block consists of single asset, no depreciation is to be charged in the terminating year as the asset has been sold in the year.

Recommendation: The Company is advised to buy the proposed equipment.

**(b) Working Notes:**

Year	Profit before tax (₹)	Profit after tax @ 50% (₹)	Cash inflows after tax (₹)	Cumulative cash inflows (₹)	Discounting factor @ 10%	Present Value (₹)	Discounting factor @ 20%	Present value @20% (₹)	Discounting factor @ 30%	Present Value @30% (₹)	Discounting factor @ 32%	Present value @32% (₹)
1	1,00,000	50,000	90,000	90,000	0.9091	81,819	0.8333	74,997	0.7692	69,228	0.7576	68,184
2	1,00,000	50,000	90,000	1,80,000	0.8264	74,376	0.6944	62,496	0.5917	53,253	0.5739	51,651
3	80,000	40,000	80,000	2,60,000	0.7513	60,104	0.5787	46,296	0.4552	36,416	0.4348	34,784
4	80,000	40,000	80,000	3,40,000	0.6830	54,640	0.4823	38,584	0.3501	28,008	0.3294	26,352
5	40,000	20,000	60,000	4,00,000	0.6209	37,254	0.4019	24,114	0.2693	16,158	0.2495	14,970
						308193		246487		203063		195941

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## 1. Payback Period Method

$$\begin{aligned}\text{Payback period} &= 2 + ₹ 20,000 / ₹ 80,000 \\ &= 2.25 \text{ years (or) 2 years 3 months}\end{aligned}$$

## 2. Rate of Return on Original Investment Method

$$\begin{aligned}\text{ARR} &= (\text{Average Profit after Tax} / \text{Investment}) \times 100 \\ &= (₹ 40,000 / ₹ 2,00,000) \times 100 = 20\%\end{aligned}$$

## 3. Rate of Return on Average Investment Method

$$\begin{aligned}\text{ARR} &= (\text{Average Profit after Tax} / \text{Average Investment}) \times 100 \\ &= ₹ 40,000 / ([₹ 2,00,000 + 0] / 2) \times 100 = 40\%\end{aligned}$$

## 4. Discounted Cash Flow Method taking Cost of Capital as 10%

Present value of cash inflows after tax (₹)	3,08,193
Less: Outflow (₹)	2,00,000
Net Present Value (₹)	1,08,193

## 5. Profitability Index

$$\begin{aligned}\text{Profitability Index} &= \text{P.V of Cash Inflows} / \text{Cash Outflow} \\ &= ₹ 3,08,193 / ₹ 2,00,000 \\ &= 1.54\end{aligned}$$

Since PI is more than 1 the company can accept the project.

## 6. Internal Rate of Return Method

$$\begin{aligned}\text{IRR} &= L + [P1 - I / P1 - P2] \times d \\ &= 30 + (2,03,063 - 2,00,000) / (2,03,063 - 1,95,941) \times 2 \\ &= 30 + 0.8602 \\ &= 30.8602\%\end{aligned}$$

## 7. Modified Internal Rate of Return (MIRR)

	1	2	3	4	5	Total
Cash inflow after tax (₹)	90,000	90,000	90,000	90,000	90,000	---
Re-investment period	4	3	2	1	0	
Re-investment at	10%	10%	10%	10%	10%	





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Future value factor	(1.1) <sup>4</sup>	(1.1) <sup>3</sup>	(1.1) <sup>2</sup>	(1.1) <sup>1</sup>	1	
Future value (₹)	1,31,769	1,19,790	96,800	88,000	60,000	4,96,359

At MIRR = 2,00,000  $[1 + \text{MIRR}]^5 = ₹ 4,96,359$   
 $= [1 + \text{MIRR}]^5 = ₹ 4,96,359 / ₹ 2,00,000 = 2.48$   
MIRR = 20%.

6. (a) Calculate “Maximum Bank Borrowings” permissible under Method I, II & III of Tandon Committee norms from the following figures and Analyse each method.

Current Liabilities	₹ in lakh	Current Assets	₹ in lakh
Creditors for purchases 200		Raw materials	400
Other current liabilities 100	300	Work in progress	40
Bank borrowings including bills discounted with bankers	400	Finished goods	180
		Receivable including bills discounted with bankers	100
		Other current assets	20
<b>Total</b>	<b>700</b>		<b>740</b>

Assume core current assets are ₹190 lakhs.

[7]

- (b) A firm is considering pushing up its sales by extending credit facilities to the following categories of customers:

- (i) Customers with a 10% risk of non-payment, and
- (ii) Customers with a 30% risk of non-payment.

The incremental sales expected in case of category (i) are ₹ 40,000 while in case of category (ii) they are ₹ 50,000. The cost of production and selling costs are 60% of sales while the collection costs amount to 5% of sales in case of category (i) and 10% of sales in case of category (ii).

Examine and analyze whether the firm has to extend credit facilities to each of the above categories of customers.

[7]

Answer:

- (a) As per Tandon Committee norms -  
Method 1:

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Under Method 1 the proprietor should contribute 25% of Working Capital Gap from their long-term source of finance and the balance is the Maximum Permissible Bank Borrowings.

In the given problem –

Particulars	₹ in lakh
Total Current Assets	740
Less: Current liabilities excluding bank borrowings	300
Working Capital Gap	440
Less: Contribution from long term source of finance (25%)	110
Maximum Permissible Bank Borrowings	330

Comment: Maximum Permissible Bank Borrowings under method 1 is ₹330 lakhs. But existing bank borrowing is ₹400 lakhs. Therefore, the excess bank borrowings of ₹70 lakhs convert into term loan.

Method 2:

Under Method- 2 the proprietor should contribute 25% of Current Assets from their long-term source of finance and the balance is the Maximum Permissible Bank Borrowings.

In the given problem –

Particulars	₹ in lakh
Total Current Assets	740
Less: Current liabilities excluding bank borrowings	300
Working Capital Gap	440
Less: Contribution from long term source of finance (25% of 740)	185
Maximum Permissible Bank Borrowings	255

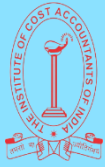
Comment: Maximum Permissible Bank Borrowings under method 2 is ₹255 lakhs. But existing bank borrowing is ₹400 lakhs. Therefore, the excess bank borrowings of ₹145 lakhs convert into term loan.

Method 3:

Under Method 3 the proprietor should contribute the entire investment in Core Current Assets and 25% of remaining current assets from their long-term source of finance and the balance is the Maximum Permissible Bank Borrowings.

In the given problem –

Particulars	₹ in lakh
Total Current Assets	740
Less: Current liabilities excluding bank borrowings	300
Working Capital Gap	440
Less: Contribution from long term source of finance (190+ 25% of (740-190))	328
Maximum Permissible Bank Borrowings	112

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Comment: A maximum permissible bank borrowing under method 3 is ₹ 112 lakh. But existing bank borrowing is ₹ 400 lakh. Therefore, the excess bank borrowings of ₹ 288 lakhs convert into term loan.

**(b)**

Evaluation of Credit Policies  
Category (i) 10% Risk of Non-payment

Particulars	₹
Incremental sales	40,000
Less: Bad debts @ 10%	4,000
Sales realized	36,000
Less: Cost of production and selling cost (40,000 × 60%) 24,000	
Less: Collection cost (40,000 × 5%) 2,000	26,000
Incremental profit	10,000

Category (ii) 30% risk of non-payment

Particulars	₹
Incremental sales	50,000
Less: Bad debts @ 30% (50,000 × 30%)	15,000
Sales realized	35,000
Less: Cost of production and selling cost (50,000 × 60%) 30,000	
Less: Collection cost (50,000 × 10%) 5,000	35,000
Incremental profit	Nil

Comment: Advise to extend credit facility to category (i) customers alone.

7. (a) **Bangabasi Ltd. belongs to a risk-class for which the appropriate capitalisation rate is 10%. It currently has outstanding 2000 equity shares of ₹100 each. The firm is contemplating the declaration of dividend of ₹8 per share at the end of the current financial year. It expects to have net earnings of ₹20,000 and has a proposal for making new investment of ₹24,000. Examine and show that under the Modigliani–Miller assumption, the payment of dividend does not affect the value of the firm. [7]**
- (b) **Calculate the operating leverage for each of the four firms P,Q,R and S from the following price and cost data. Analyze the relationship between levels of fixed costs and the resulting degree of operating leverage? Assume number of units sold is 10,000.**



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Particulars	Firms			
	P	Q	R	S
Sales price per unit	₹20	₹32	₹50	₹70
Variables cost per unit	₹6	₹16	₹20	₹50
Fixed operating cost	₹1,60,000	₹80,000	₹4,00,000	Nil

[7]

**Answer:**

- (a)  $P_0$  = Opening price of each share = ₹100  
 $P_1$  = Market price of each share at the end of the year.  
 $D_1$  = Dividend per share to be paid at the end of the year = ₹ 8  
 $k$  = Cost of capital = 0.10.  
 $n$  = No. of Outstanding share at the beginning of the year = 2,000 shares.  
 $\Delta n$  = No. of additional shares to be issued.  
 $E$  = Earning of the company = ₹20,000.  
 $I$  = Total amount required for investment = ₹24,000.

Valuation of the firm when dividends are paid:

$$(i) P = (P_1 + D_1) / (1 + k)$$

$$100 = (8 + P_1) / (1 + 0.10)$$

$$8 + P_1 = 100 \times 1.10$$

$$P_1 = 110 - 8 = ₹102$$

(ii) Amount required to be raised from the issue of new share

$$(\Delta n P_1) = I - (E - n D_1)$$

$$\text{or, } \Delta n P_1 = ₹24,000 - [₹20,000 - (8 \times ₹2,000)]$$

$$\text{or, } \Delta n P_1 = ₹24,000 - ₹4,000$$

$$\text{or, } \Delta n P_1 = ₹20,000$$

$$(iii) \Delta n P_1 = ₹ 20,000$$

$$\Delta n(102) = 20,000 \quad (P_1 = 102)$$

$$\text{or, } \Delta n = 20,000 / 102$$

(iv) Value of the firm ( $n P_0$ ) =  $\{P (n + \Delta n) - I + E\} \div (1 + k)$ 

$$n P_0 = [102 (2,000 + (20,000 / 102)) - 24,000 + 20,000] \div (1 + 0.10)$$

$$n P_0 = 2,24,000 - 24,000 + 20,000 \div (1 + 0.10)$$

$$n P_0 = 2,20,000 \div 1.10$$

$$n P_0 = ₹ 2,00,000$$

Hence, total value of the firm is ₹2,00,000.

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Valuation of the firm when dividends are not paid:

$$(i) P_0 = (P_1 + D_1) / (1 + k)$$

$$100 = (0 + P_1) / (1 + 0.10)$$

$$P_1 = 100 \times 1.10$$

$$P_1 = ₹110$$

(ii) Amount required to be raised from the issue of new share

$$(\Delta n P_1) = I - (E - n D_1)$$

$$\text{or, } \Delta n P_1 = ₹24,000 - [₹20,000 - (2,000 \times 0)]$$

$$\text{or, } \Delta n P_1 = ₹24,000 - ₹20,000$$

$$\text{or, } \Delta n P_1 = ₹4,000$$

$$(iii) \Delta n P_1 = ₹4,000$$

$$\Delta n(110) = 4,000 \quad (P_1 = 110)$$

$$\text{or, } \Delta n = 4000 / 110$$

(iv) Value of the firm ( $n P_0$ ) =  $\{P(n + \Delta n) - I + E\} \div (1 + k)$

$$n P_0 = [110(2,000 + (4,000 / 110)) - 24,000 + 20,000] \div (1 + 0.10)$$

$$n P_0 = 2,24,000 - 24,000 + 20,000 \div (1 + 0.10)$$

$$n P_0 = 2,20,000 \div 1.10$$

$$n P_0 = ₹2,00,000$$

Hence, total value of the firm is ₹2,00,000.

Thus, it is clear that the total value of the firm remains unchanged whether dividends are paid or not i.e., the payment of dividend does not affect the value of the firm.

(b)

Particulars	Firms			
	P	Q	R	S
Sales (units)	10,000	10,000	10,000	10,000
Sales revenue (unit × price)	2,00,000	3,20,000	5,00,000	7,00,000
Less: Variable cost (units × VC per unit)	60,000	1,60,000	2,00,000	5,00,000
Less : Fixed cost	1,60,000	80,000	4,00,000	NIL
EBIT	(20,000)	80,000	(1,00,000)	2,00,000

$$DOL = (\text{Current sales} - \text{Variable cost}) / \text{Current EBIT}$$

$$DOL(P) = (2,00,000 - 60,000) / 20,000 = 7$$

$$DOL(Q) = (3,20,000 - 1,60,000) / 80,000 = 2$$

$$DOL(R) = (5,00,000 - 2,00,000) / 1,00,000 = 3$$

$$DOL(S) = (7,00,000 - 5,00,000) / 2,00,000 = 1$$

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The operating leverage exists only when there are fixed cost. In this case of firm S, there is no magnified effect on the EBIT due to change in sales. Operating leverage is maximum in firm P, followed by firm R and minimum in firm Q. The interpretation of DOL of 7 is that 1% change in sales results in 7% change in EBIT level in the direction of the change of sales level of firm P.

8. (a) **Describe Quantitative Financial Data and Qualitative Financial Data. Explain Nominal Scale and Ratio Scale in the context of types of data.** [7]
- (b) **Describe how we can do data Visualisation in the right way.** [7]

**Answers:**

- (a) Data plays a very important role in the study of finance and cost accounting. From the inception of the study of finance, accounting and cost accounting, data always played an important role. Be it in the form of financial statements, or cost statements etc the finance and accounting professionals played a significant role in helping the management to make prudent decisions.

The kinds of data used in finance and costing may be quantitative as well as qualitative in nature.

- Quantitative financial data: By the term ‘quantitative data’, we mean the data expressed in numbers. The quantitative data availability in finance is significant. The stock price data, financial statements etc are examples of quantitative data. As most of the financial records are maintained in the form of organised numerical data.
- Qualitative financial data: However, some data in financial studies may appear in a qualitative format e.g. text, videos, audio etc. These types of data may be very useful for financial analysis. For example, the ‘management discussion and analysis’ presented as part of annual report of a company is mostly presented in the form of text. This information is useful for getting an insight into the performance of the business. Similarly, key executives often appear for an interview in business channels. These interactions are often goldmines for data and information.

**Nominal Scale:** Nominal scale is being used for categorising data. Under this scale, observations are classified based on certain characteristics. The category labels may contain numbers but have no numerical value.

Examples could be, classifying equities into small-cap, mid-cap, and large-cap categories or classifying funds as equity funds, debt funds, and balanced funds etc.

**Ratio scale:** The ratio scale possesses all characteristics of the nominal, ordinal, and interval scales. The acquired data can not only be classified and rated on a ratio scale, but also have equal intervals. A ratio scale has a true zero, meaning that zero

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has a significant value. The genuine zero value on a ratio scale allows for the magnitude to be described. For example, length, time, mass, money, age, etc. are typical examples of ratio scales. For data analysis, a ratio scale may be utilised to measure sales, pricing, market share, and client count.

- (b) Finance professionals who are investigating how data visualisation might help their analytics efforts and communication should keep the following in mind:
- Know the objective: Before the development of great images, one must first grasp the objectives. HBR's Berinato suggests, first establishment of the information if it's conceptual or data-driven (i.e. does it rely on qualitative or quantitative data) is required. Then specify if the objective is exploratory or declarative. For instance, if the objective is to display the income from the prior quarter, the goal is declarative. If, on the other hand, one is curious as to whether the income increase correlates with the social media spending, the objective is exploratory. According to Berinato, determining the answers would assist in determining the tools and formats required.
  - Always keep the audience in mind: Who views the data visualisations will determine the degree of detail required. For instance, finance data presentations for the C-suite require high-level, highly relevant information to aid in strategic decision-making. However, if one is delivering a presentation to 'line of business' executives, delving into the deeper details might offer them with knowledge that influences their daily operations.
  - Invest in the best technology: There are a multitude of technological tools that make it simple to produce engaging visualisations in the current digital age. The firm should first implement an ERP that removes data silos and develops a centralised information repository. Then, look for tools that allows to instantly display data by dragging and dropping assets, charts, and graphs; offer search options and guided navigation to assist in answering queries; and enable any member of the financial team to generate graphics.
  - Improve the team's ability to visualise data: Most of the agile finance directors rank their team's data visualisation abilities as good, compared to only twenty-four percent of their counterparts, according to an AICPA survey. While everyone on the finance team can understand the fundamentals of data visualisation, training and a shift in hiring priorities may advance the team's data visualisation skills. Find ways to incorporate user training on data visualisation tools, so that the staff is aware of the options that the technology affords. Additionally, when making new recruits, look out individuals with proficiency in data analytics and extensive data visualisation experience.