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) **If annual effective rate of interest is 10.25% per annum and nominal rate of return is 10% per annum what is the frequency of compounding?**

(a) 1
(b) 3
(c) 2
(d) 4

(ii) **To make the data turn into user friendly information, it should go one/more of following core steps:**

(a) Collection of data
(b) Organising the data
(c) Data processing
(d) All of the above

(iii) **Data science plays an important role in:**

(a) Risk analytics
(b) Customer data management
(c) Consumer analytics
(d) All of the above

(iv) **Maps may be used for displaying:**

(a) Pin code
(b) Country name
(c) State abbreviation
(d) All of the above

(v) **The degree of operating leverage and degree of financial leverage of VINTEX LTD. are 2.00 and 1.5 respectively. What will be the percentage change in EPS, if the sale increases by 10%?**

(a) 10% increase
(b) 15% increase
(c) 30% increase
(d) 35% increase

(vi) **Operating cycle is also called as _____**

(a) Business cycle
(b) Working capital cycle
(c) Working cycle
(d) Current asset cycle

(vii) At Indifference level of EBIT, different capital has _____.
(a) Same EBIT
(b) Same EPS
(c) Same PAT
(d) Same PBT

(viii) Average collection period is 2 months, cash sales and average receivables are ₹ 5,00,000 and ₹6,50,000 respectively. The sales amount would be -
(a) ₹ 40,00,000
(b) ₹ 42,00,000
(c) ₹ 44,00,000
(d) ₹ 48,50,000

(ix) 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

(x) A proposal is not a Capital Budgeting proposal if it:
(a) is related to Fixed Assets
(b) brings long-term benefits
(c) brings short-term benefits only
(d) has very large investment

(xi) Advantage of debt financing is:
(a) Interest is tax-deductible
(b) It reduces WACC
(c) It does not dilute owners control
(d) All of the above.

(xii) ABC Ltd. has a Current Ratio of 1.5: 1 and Net Current Assets of ₹ 5,00,000. What are the Current Assets?
(a) ₹5,00,000
(b) ₹10,00,000
(c) ₹15,00,000
(d) ₹25,00,000

(xiii) XYZ Ltd. has earned 8% Return on Total Assets of ₹ 50,00,000 and has a Net Profit Ratio of 5%. Find out the Sales of the firm.
(a) ₹ 4,00,000
(b) ₹ 2,50,000
(c) ₹ 80,00,000
(d) ₹ 83,33,333.

(xiv) Secondary Market in India is regulated by:

(a) Reserve Bank of India
(b) Securities and Exchange Board of India
(c) Ministry of Finance
(d) Forward Market Commission

(xv) Return on Assets and Return on Investment Ratios belong to:

(a) **Liquidity Ratios**
(b) **Profitability Ratios**
(c) **Solvency Ratios**
(d) **Turnover**

Answer:

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

SECTION – B

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

2. (a) Explain the regulatory role of RBI. [7]

(b) Summarize the various applications of data mining techniques in finance and accounting. [7]

Answer:

(a) (1) Regulator of the Banking System:

The Reserve Bank regulates and supervises the nation's financial system. Different departments of the Reserve Bank oversee the various entities that comprise India's financial infrastructure. RBI oversees:

(A) Commercial Banks and All-India Development Financial Institutions: Regulated by the Department of Banking Operations and Development, supervised by the Department of Banking Supervision.

(B) Urban Co-operative Banks: Regulated and supervised by the Urban Banks Department.

(C) Regional Rural Banks (RRB), District Central Cooperative Banks and State Co-operative Banks: Regulated by the Rural Planning and Credit Department and supervised by NABARD.

(D) Non-Banking Financial Companies (NBFC): Regulated and supervised by the Department of Non- Banking Supervision.

The Board for Financial Supervision oversees the Reserve Bank's regulatory and supervisory responsibilities.

Consumer confidence and trust are fundamental to the proper functioning of the banking system. RBI's supervision and regulation help ensure that banks are stable and that the system functions smoothly.

As the nation's financial regulator, the Reserve Bank handles a range of activities, including:

(A) Licensing
(B) Prescribing capital requirements
(C) Monitoring governance
(D) Setting prudential regulations to ensure solvency and liquidity of the banks
(E) Prescribing lending to certain priority sectors of the economy
(F) Regulating interest rates in specific areas
(G) Setting appropriate regulatory norms related to income recognition, asset classification, provisioning, investment valuation, exposure limits and the like initiating new regulation.

(2) Regulator and Supervisor of Payment and Settlement Systems:

The Payment and Settlement Systems Act of 2007 (PSS Act) gives the Reserve Bank oversight authority, including regulation and supervision, for the payment and settlement systems in the country. In this role, RBI focus on the development and functioning of safe, secure and efficient payment and settlement mechanisms.

The Reserve Bank has a two-tiered structure. The first tier provides the basic framework for our payment systems. The second-tier focusses on supervision of this framework. As part of the basic framework, the Reserve Bank's network of secure systems handles various types of payment and settlement activities. Most operate on the security platform of the Indian Financial Network (INFINET), using digital signatures for further security of transactions. The various systems used are as follows:

(A) Retail payment systems: Facilitating cheque clearing, electronic funds transfer, through National Electronic Funds Transfer (NEFT), settlement of card payments and bulk payments, such as electronic clearing services. Operated through local clearing houses throughout the country.
(B) Large Value Systems: Facilitating settlement of inter-bank transactions from financial markets.

These include:

(A) Real Time Gross Settlement System (RTGS): For funds transfers
(B) Securities Settlement System: For the government securities market.
(C) Foreign Exchange Clearing: For transactions involving foreign currency.
(D) Department of Payment and Settlement Systems: The Reserve Bank's payment and settlement systems regulatory arm.
(E) Department of Information Technology: Technology support for the payment systems and for the Reserve Bank's internal IT systems.

(b) The various applications of data mining techniques in finance and accounting;

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

3. (a) Following are the ratios to the trading activities of National Traders Ltd:

Debtors velocity	**3 months**
Stock velocity	**8 months**
Creditors velocity	**2 months**
Gross profit ratio	**25%**

Gross profit for a year ended 31st December, 2022 amounts to ₹ 4,00,000
Closing stock of the year is ₹ 10,000 above the opening stock.
Bills receivable amount to ₹ 25,000 and Bills payable to ₹ 10,000.
Compute:
(A) Sales
(B) Sundry Debtors
(C) Closing stock &
(D) Sundry creditors. **[7]**

(b) The Balance Sheets of A, B, & C Co. Ltd. as at the end of 2021 and 2022 are given below:

Liabilities	2021 (₹)	2022 (₹)	Assets	2021 (₹)	2022 (₹)
Share Capital	**1,00,000**	**1,50,000**	**Freehold land**	**1,00,000**	**1,00,000**
Share premium		**5,000**	**Plant at cost**	**1,04,000**	**1,00,000**
General Reserve	**50,000**	**60,000**	**Furniture at cost**	**7,000**	**9,000**
Profit & Loss Account	**10,000**	**17,000**	**Investments**	**60,000**	**80,000**
6% Debentures	**70,000**	**50,000**	**Debtors**	**30,000**	**70,000**

Provision for Depreciation on Plant	**50,000**	**56,000**	**Stock**	**60,000**	**65,000**
Provision for Dep. on Furniture	**5,000**	**6,000**	**Cash**	**30,000**	**45,000**
Provision for taxation	**20,000**	**30,000**			
Sundry Creditors	**86,000**	**95,000**			
	3,91,000	**4,69,000**		**3,91,000**	**4,69,000**

A Plant purchased for ₹ 4,000 (Depreciation ₹ 2,000) was sold for Cash for ₹ 800 on September 30, 2022. On June 30, 2022 an item of furniture was purchased for ₹ 2,000. These were the only transactions concerning fixed assets during 2022. A dividend of 22½ % on original shares was paid. You are required to prepare Funds Flow Statement and verify the results by preparing a schedule of changes in Working Capital. **[7]**

Answer:

(a) Computation of Sales, Sundry Debtors, Closing Stock and Sundry creditors:

Given Gross Profit ration = 25%

Gross Profit amount = ₹ 4,00,000

(A) $\text{Sales} = \text{G.P. amount} \times \frac{100}{\text{GP\%}}$

$= ₹\ 4,00,000 \times \frac{100}{25}$

$= ₹\ 16,00,000$

$\text{Debtors} = \text{Sales} \times \frac{3}{12} = ₹\ 16,00,000 \times \frac{3}{12} = ₹\ 4,00,000$

Bills Receivable = ₹ 25,000

(B) Sundry debtors = Total debtors – Bills Receivable = ₹ 4,00,000 - ₹ 25,000 = ₹ 3,75,000

(C) Stock Velocity given = 8 months

Cost of Goods Sold (COGS) = Sales –GP = ₹ 16,00,000 - ₹ 4,00,000 = ₹ 12,00,00

Let 'x' be the opening stock, then the closing stock = x +10,000

⇨ $\text{Average stock} = \frac{x + (x + 10{,}000)}{2} = \frac{2x + 10{,}000}{2}$

⇨ Average Stock = x+ 5000

$\frac{\text{COGS}}{\text{AvgStock}} = \text{InventoryTurnover}$

$* \text{Inventory Holding period (or) stock} = \frac{12\,\text{months}}{\text{InventoryTurnover}} = 8$

$\text{Inventory Turnover} = \frac{12}{8} = \frac{3}{2} = 1.5$

Avg. Stock = $\frac{12,00,000}{1.5}$

Avg. Sock = ₹ 8,00,000

Avg. Stock = x+5000

⇨ X=795000

Opening Stock = ₹ 7,95,000

Closing Stock = x+10000 =₹ 7,95,000 + ₹ 10,000 = ₹ 8,05,000

(D) Sundry creditors:

Opening Stock + Purchase – Closing Stock = COGS

7,95,000 + Purchase – 8,05,000 = 12,00,000

Purchases = 12,10,000

Creditors Velocity = 2 Months

Creditors = 12,10,000 × $\frac{2}{12}$ = 2,01,667

(-) Bill payable = 10,000

Sundry Creditors → = 1,91,667

(b)

P & L Adjustment A/C

Particulars	₹	Particulars	₹
To General Reserve	1,000	By Balance b/d	10,000
To Depreciation	9,000	By Funds from operations	49,700
To Loss on Sale of plant	1,200		
To Dividend	22,500		
To Balance c/d	17,000		
	59,700		59,700

Provision for depreciation on plant		
Closing Bal	-	56,000
Opening Balance	50,000	
(-) Sold	(2,000)	
		48,000
Dep on Furniture		8,000
Total Depreciation		1,000
		9,000

	2021	2022
A. Current assets		
Debtors	30,000	70,000
Sock	60,000	65,000
Cash	30,000	45,000
	1,20,000	1,80,000

B. Current Liabilities		
Provision for tax	20,000	30,000
Creditors	86,000	95,000
	1,06,000	1,25,000
C. Working Capital (A-B)	14,000	55,000
Increase in Working Capital	41,000	
	55,000	55,000

Funds Flow statement for the year 2022:

Sources:	
Funds from operations	49,700
Issue of Shares	55,000
Sales of Plant	800
	1,05,500
Applications:	
Increase in working capital	41,000
Redemption of Debentures	20,000
Purchase of Furniture	2,000
Purchase of Investments	20,000
Payment of Dividend	22,500
	1,05,500

4. (a) Presented below are revenue and expense data for the XYZ Company:

	2022 (₹)	**2021 (₹)**
Sales	**8,16,000**	**6,56,500**
Sales returns and allowances	**16,000**	**6,500**
Cost of goods sold	**4,00,000**	**3,12,000**
Selling Expenses	**2,00,000**	**1,30,000**
General Expenses	**1,20,000**	**78,000**
Miscellaneous Income	**6,400**	**6,500**
Income Tax	**32,000**	**67,600**

You are required to prepare a comparative statement for the year 2022 and 2021 for the company and also comment on the relationships revealed in the comparative income statement. [7]

(b) The following are the extracts from the financial statements of ABC Ltd.

	(₹ In lakhs)
Operating profit	**105**
Less: Interest on debenture	**33**
	72
Less: Income-tax	**36**
Net Profit	**36**
Equity share capital (share of ₹ 10 each)	**200**

Reserves ad surplus	**100**
15% Non-convertible debentures	**220**
	520

The market price per equity share is ₹ 12 and per debenture is ₹ 93.75. You are required to calculate:

(A) the earnings per share.

(B) the percentage of cost of capital to the company for the debenture fund and the equity. **[7]**

Answer:

(a)

Comparative Income Statement

	Amount (₹)		%	
	2022	2021	2022	2021
Sales	8,16,000	6,56,500	102.0	101.0
Less: Sales returns and allowances	16,000	6,500	2.0	1.0
Net Sales	8,00,000	6,50,000	100.0	100.0
Less: Cost of goods sold	4,00,000	3,12,000	50.0	48.0
Gross Profit (A)	4,00,000	3,38,000	50.0	52.00
Less: Operation Expenses:				
Selling Expenses:	2,00,000	1,30,000	25.00	20.00
General Expenses	1,20,000	78,000	15.00	12.00
Total operating Expenses (B)	3,20,000	2,08,000	40.00	32.00
Net Operating Income (A) - (B)	80,000	1,30,000	10.00	20.00
Add: Miscellaneous Income	6,400	6,500	0.80	1.00
Income before Tax	86,400	1,36,500	10.80	21.00
Less: Income Tax	32,000	67,600	4.00	10.4
Net Income after Tax	54,400	68,900	6.8	10.6

The following are the significant rendered by the comparative income statement:

(i) The ratio of gross profit decreased from 52% to 50% because of increase in the ratio of cost of goods sold. The company suffered ₹ 16,000 (i.e., 2% of ₹ 8,00,000) decrease in potential gross profit.

(ii) The rate of selling expenses rose from 20% to 25% because of increase in advertising expenses.

(iii) There is 3% of increase in general expenses. This may be due to strike in the plant.

(iv) The increase in sales returns and allowances may be due to poor product quality or too aggressive sales policy.

(b)

(A) Earnings per Share:

Profit available for equity share-holders 36l

No. of equity shared = $\frac{200l}{10}$ =20 lakh shares

EPS= $\frac{36l}{20l} = \frac{Profits\ available\ to\ Equity\ holders}{No.\ of\ Equity\ shares}$ = ₹ 1.8 per share

(B) (i) Cost of debentures:

K_d based on Book Value:

$$K_d = \frac{\frac{Int(1-T)}{NS} X100}{= \frac{33l(1-0.5)}{220l} X100 = 7.5\%}$$

K_d based on Market Value of Debenture:

Market value of debentures $= \frac{220}{100} X 93.75 = 206.25l$

$$Kd = \frac{33l(1-0.5)}{206.25l} X100 = 8\%$$

(ii) Cost of equity

$$K_e = \frac{EPS}{NPS} X100 = \frac{1.8}{12} X100 = 15\%$$

$$K_e \text{ based on Book value} = = \frac{\frac{\text{Earning to EQ holders}}{\text{EQ holders (Capital + Reserves)}}}{= \frac{36l}{300l} X100 = 12\%}$$

5. (a) A project requires an initial investment of ₹ 2,25,000 and is expected to generate the following net cash inflows:
Year 1 (2019): ₹ 95,000;
Year 2 (2020): ₹ 80,000;
Year 3 (2021): ₹ 60,000;
Year 4 (2022): ₹ 55,000.
Assess and compute net present value of the project if the minimum desired rate of return is 12%. [7]

(b) United Industries Ltd. has an investment budget of ₹ 100 lakhs for 2023-24. It has short listed two projects A and B after completing the market and technical appraisals. The management wants to complete the financial appraisal before making the investment. Further particulars regarding the two projects are given below:

	(₹ Lakhs)	
Particulars	**A**	**B**
Investment required	**100**	**90**
Average annual cash inflow before depreciation and tax (estimate)	**28**	**24**

Salvage value: Nil for both projects. Estimate life – 10 years for both projects.
The company follows straight line method of charging depreciation. Its tax rate is 50%.
You are required to calculate:
i) Payback period and ii) IRR for the 2 projects.

Note: P.V of an annuity of ₹ 1 for ten years at different discount rate is given below:

Rate %	10	11	12	13	14	15
Annuity Value of return	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188

[7]

Answer:

(a)

Computation of PVECF

Period	Cash Inflows Amount (₹)	PVIF @ 12%	Present Value (₹)
Year 1 (2018)	95,000	0.893	84,835
Year 2 (2019)	80,000	0.797	63,760
Year 3 (2020)	60,000	0.712	42,720
Year 4 (2021)	55,000	0.636	34,980
PVECF (Total)			2,26,295

Here, Initial investment = ₹ 2,25,000.

Now, NPV = PVECF – Initial Investment

Where,

= ₹ (2,26,295 – 2,25,000) = ₹ 1,295

The project seems attractive because its net present value is positive.

(b) W.N:- Cash Inflows

[₹ in lakhs]

	Project A	Project B
CIF before Depr. And Tax	28	24
(-) Depr. $\left(\frac{100}{10}\right)\left(\frac{90}{10}\right)$	10	9
PBT	18	15
(-) Tax @ 50%	9	7.5
PAT	9	7.5
(+) Dep	10	9
	19	16. 5
Cash outflow (or) cost		
Payback period $\left(\frac{100}{19}\right)\left(\frac{90}{16.5}\right)$	100 5.263 years 5 yrs 3.12m 5 yrs 3m 4d	90 5.454 years 5 years 5.44m 5 year 5m 13d

IRR for project A:

As Inflows from project are uniform, then the

Cumulative DCG/ Annuity factor at IRR = $\frac{100l}{19l}$ = 5.263

From the given annuity table, 5.26 lies between the value 5.2161 and 5.4262 i.e., lies between 13% and 14%

P.V of CIF @ 13% = 5.4262 x 19l = 103.097l

P.V of CIF @ 14% = 5.2161 x 19l = 99.105l

$$IRR = \text{lower rate} + \frac{\text{P.V of CIF@law rate} - \text{P.V.Co}}{\text{P.V.Of CIF@ lowrate} - \text{P.V of CIF@Highrate}} \text{ X Rage}$$

$$= 13 + \frac{103.097\text{l} - 100\text{l}}{103.097\text{l} - 99.105\text{l}} \text{ X1}$$

$$= 13 + \frac{3.097\text{l}}{3.992\text{l}}$$

$$= 13 + 0.776$$

$$= 13.776$$

IRR of Project B:

$$\text{Cumulative DCG/ Annuity factor at IRR} = \frac{90\text{l}}{16.5\text{l}} = 5.454$$

From the given annuity table, 5.454 lies between the value 5.4262 and 5.6502 i.e., lies between 12% and 13%

P.V of CIF @ 12% = 5.6502 x 16.5l = 93.228l

P.V of CIF @ 13% = 5.4262 x 16.5l = 89.532l

$$IRR = \text{lower rate} + \frac{\text{P.V of CIF@law rate} - \text{P.V.Co}}{\text{P.V.Of CIF@ lowrate} - \text{P.V of CIF@Highrate}} \text{ X Rage}$$

$$= 12 + \frac{93.228\text{l} - 90\text{l}}{93.228\text{l} - 89.532\text{l}} \text{ X1}$$

$$= 12 + \frac{3.228\text{l}}{3.696\text{l}}$$

$$= 12 + 0.873$$

$$= 12.873$$

6. (a) The board of Directors of Nanak Engineering Company Private Ltd. request you to prepare a statement showing the Working Capital requirements forecast for a level of activity of 1,56,000 units of production.

The following information is available for your calculation:

A.

	Per unit (₹)
Raw materials	**90**
Direct labour	**40**
Overheads	**75**
	205
Profits	**60**
Selling price per unit	**265**

B. (i) Raw materials are in stock on average one month.

(ii) Materials are in process, on average 2 weeks.

(iii) Finished goods are in stock, on average 1 month.

(iv) Credit allowed by supplier one month.

(v) Time lag in payment from debtors two months.

(vi) Lag in payment of wages 1½ week.

(vii) Lag in payment of overheads is one month.

20% of the output is sold against cash. Cash in hand and at bank is expected to be ₹60,000. It is to be assumed that production is carried on evenly throughout the year, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month. [7]

(b) Surya Industries Ltd. is marketing all its products through a network of dealers. All sales are on credit and the dealers are given one-month time to settle bills. The company is thinking of changing the credit period with a view to increase its overall profits. The marketing department has prepared the following estimates for different periods of credit:

Particulars	Present Policy	Plan I	Plan II	Plan III
Credit period (in months)	1	1.5	2	3
Sales (₹ Lakhs)	120	130	150	180
Fixed costs (₹ Lakhs)	30	30	35	40
Bad debts (% of sales)	0.5	0.8	1	2

The company has a contribution/sales ratio of 40% further it requires a pre-tax return on investment at 20%. Examine each of the above proposals and recommend the best credit period for the company. [7]

Answer:

(a) Computation of working capital:

Current assets:

1.	Raw Material [1,56,000 x 90 x $\frac{4}{52}$]		10,80,000
2.	Martial – in – process		
	RM – [1,56,000 x 90 x $\frac{2}{52}$]	5,40,000	
	Labour [1,56,000 x 40 x $\frac{2}{52}$ x 50%]	1,20,000	
	OH [1,56,000 x 75 x $\frac{2}{52}$ x 50%]	2,25,000	8,85,000
3.	FG (156000 x 205 x $\frac{4}{52}$)		24,60,000
4.	Debtors (1,56,000 x 265 x $\frac{8}{52}$ x 80%)		50,88,000
5.	Cash in hand required		60,000
			95,73,000

Current Liabilities:

(1)	Creditors for material [1,56,000 x 90 x $\frac{4}{52}$]	10,80,000
(2)	O/S Wages [1,56,000 x 40 x $\frac{1.5}{52}$]	1,80,000
(3)	O/S OH [1,56,000 x 75 x $\frac{4}{52}$]	9,00,000
		21,60,000

Working capital = CA-CL = 95,73,000 – 21,60,000 = 74,13,000

(b)

	Amount in ₹ lakhs			
Fixed Costs	30	30	35	40
Profit Before Bad debts and ROI in Debtors	18	22	25	32
Cost	(120-18) 102	(130-22) 108	125	148
Amt. invested in Receivable	(102 x 1/12) 8.5	13.5	20.83	37
Required return on investment in receivables @ 20%	(8.5 x 20%) 1.7	2.7	4.166	7.4
Bad debs (%)	0.5	0.8	1	2
Bad debts amount	0.60	1.04	1.5	3.6
Net profit (18-17-0.60)	15.7	18.26	19.334	21

Better to choose plan – III as it gives the highest Net Income.

7. (a) Assuming no taxes and given the earnings before interest and taxes (EBIT), interest (I) at 10% and equity capitalisation rate (K_e) below, calculate the total market value of each firm under Net Income approach:

Firms	EBIT	I	K_e
	₹	₹	
X	2,00,000	20,000	12.0%
Y	3,00,000	60,000	16.0%
Z	5,00,000	2,00,000	15.0%
W	6,00,000	2,40,000	18.0%

Also determine the weighted average cost of capital for each firm. [7]

(b) Calculate the degree of operating leverage (DOL), degree of financial leverage (DFL) and the degree of combined leverage (DCL) for the following firms and interpret the results.

	Firm K	Firm L	Firm M
1. Output (Units)	60,000	15,000	1,00,000

2. Fixed costs (₹)	**7,000**	**14,000**	**1,500**
3. Variable cost per unit (₹)	**0.20**	**1.50**	**0.02**
4. Interest on borrowed funds (₹)	**4,000**	**8,000**	**—**
5. Selling price per unit (₹)	**0.60**	**5.00**	**0.10**

[7]

Answer:

(a)

Computation of Value of each firm and WACC

	X	Y	Z	W
EBIT	2,00,000	3,00,000	5,00,000	6,00,00
Interest @ 10%	(20,000)	(60,000)	(2,00,000)	(2,40,000)
EBY/EAT	1,80,000	2,40,000	3,00,000	3,60,000
Ke	12.0%	16.0%	15.0%	18.0%
Value of equity $\left(\frac{EAT}{Ke}\right)$	15,00,000	15,00,000	20,00,000	20,00,000
Value of Debt $\left(\frac{Interest}{Kd}\right)$	2,00,000	6,00,000	20,00,000	24,00,000
Value of the firm	17,00,000	21,00,000	40,00,000	44,00,000
Ko= $\left(\frac{EBIT}{Value}\right)X100$	11..764%	14.28%	12.5%	13.63%

(b) Computation of Operating Leverage, Financial Leverage, Combined Leverage for the three firms:

	K	L	M
Production Qty	60,000	15,000	1,00,000
Selling Price	0.6	5	0.10
Sales	36,000	75,000	10,000
V.C	(0.2)	(1.50)	(0.02)
	12,000	22,500	2,000
Contribution	24,000	52,500	8,000
Fixed cost	7,000	14,000	1,500
EBIT	17,000	38,500	6,500
Operating Leverage	24,000	52,500	8,000
	17,000	38,500	6,500
EBIT	1.41	1.36	1.23
(-) Interest	17,000	38,500	6,500
EBT	4,000	8,000	-
Financial Leverage	17,000	38,500	6,500
	13,000	30,500	6,500
	1.30	1.26	1
	24,000	52,500	8,000
	13,000	30,500	6,500
Combined Leverage $\left(\frac{C}{EBT}\right)$	1.846	1.72	1.23

8. (a) Interpret the various types of data used in Finance and Costing. [7]

(b) Describe Data Analytics and the steps involved in Data Analytics. [2+5=7]

Answer:

(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.

There is another way of classifying the types of data. The data may be classified also as:

(i) Nominal
(ii) Ordinal
(iii) Interval
(iv) Ratio

Each gives a distinct set of traits that influences the sort of analysis that may be conducted. The differentiation between the four scale types is based on three basic characteristics:

(A) Whether the sequence of answers matters or not
(B) Whether the gap between observations is significant or interpretable, and
(C) The existence or presence of a genuine zero.

We will briefly discuss these four types below:

(i) 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.

(ii) Ordinal Scale: Ordinal scale is being used for classifying and put it in order. The numbers just indicate an order. They do not specify how much better or worse a stock is at a specific price compared to one with a lower price. For example, the top 10 stocks by P/E ratio.

(iii) Interval scale: Interval scale is used for categorising and ranking using an equal interval scale. Equal intervals separate neighbouring scale values. As a result of scale's arbitrary zero point, ratios cannot be calculated. For example, temperature scales. The temperature of 40 degrees is 5 degrees higher than that of 35 degrees. The issue is that a temperature of 0 degrees Celsius does not indicate the absence of temperature.
A temperature of 20 degrees is thus not always twice as hot as a temperature of 10 degrees.

(iv) 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 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) Data analytics is the science of evaluating unprocessed datasets to draw conclusions about the information they contain. It helps us to identify patterns in the raw data and extract useful information from them.
Applications containing machine learning algorithms, simulation, and automated systems may be utilised by data analytics procedures and methodologies. For human usage, the systems and algorithms process unstructured data.
These data are evaluated and used to assist firms in gaining a deeper understanding of their customers, analysing their promotional activities, customising their content, developing content strategies, and creating new products.
Data analytics enables businesses to boost market efficiency and increase profits.

Following are the steps for data analytics:

- Step 1: Criteria for grouping data: Data may be segmented by a variety of parameters, including age, population, income, and sex. The data values might be either numeric or category.
- Step 2: Collecting the data: Data may be gathered from several sources, including internet sources, computers, personnel, and community sources.
- Step 3: Organizing the data: After collecting the data, it must be arranged so that it can be analysed. Statistical data can be organised on a spreadsheet or other programme capable of handling statistical data.
- Step 4: Cleaning the data: The data is initially cleansed to verify that there are no duplicates or errors. The document is then examined to ensure that it is comprehensive. Before data is sent to a data analyst for analysis, it is beneficial to rectify or eliminate any errors by cleaning the data.
- Step 5: Adopt the right type of data analytics process:
  There are four types of data analytics process:
  (i) Descriptive analytics
  (ii) Diagnostics analytics
  (iii) Predictive analytics
  (iv) Prescriptive analytics