Time Allowed: 3 Hours **Full Marks: 100**

The figures in the margin on the right side indicate full marks.
Where considered necessary, suitable assumptions may be made and clearly indicated in the answer.
Answer Question No. 1 and any five from Question No. 2, 3, 4, 5, 6, 7 and 8.

SECTION - A

1. (a)

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

(b)

(i)	True
(ii)	False
(iii)	False
(iv)	True
(v)	True
(vi)	True
(vii)	True

(c)

(i)	bell-shaped
(ii)	Finance
(iii)	greater
(iv)	systematic
(v)	money
(vi)	efficiency

SECTION - B

2. (a) Systematic risk represents that portion of total risk which is attributable to factors that affect the market as a whole. It arises out of external and uncontrollable factors, which are not specific to a security or industry to which such security belongs. Different types of systematic risks are discussed below:

(i) Market Risk: These are risks that are triggered due to social, political and economic events. These risks arise due to changes in demand and supply, expectations of the investors, information flow, investor's risk perception, etc. consequent to the social, political or economic events.

(ii) Interest Rate Risk: Uncertainty of future market values and extent of income in the future, due to fluctuations in the general level of interest, is known as Interest Rate Risk. These are risks arising due to fluctuating rates of interest and cost of corporate debt.

(iii) Purchasing Power Risk: Purchasing Power Risk is the erosion in the value of money due to the effects of inflation.

(b) (i) The two segments of capital market namely primary market and secondary market are interrelated.

The securities issued in the primary market are invariably listed on a secondary market (recognized stock exchange) for dealings in them. The practice of listing of new issues on the stock market is of immense utility to the potential investors who can be sure that when they receive an allotment of new issues, they will subsequently be able to dispose them off any time in the stock exchange.

The stock exchanges exercise considerable control over the organisation of new issues. The new issues of securities which seek stock quotation/listing have to comply with statutory rules as well as regulations framed by the stock exchanges.

The markets for new and old securities are, economically, an integral part of a single market- the capital market. When value of share increases, the volume of new issue increases and vice-versa. The functioning of secondary market has direct influence on the activities of new issue market. If stock market performs well then it also inspires the new issue market.

(ii) The features of Certificate of Deposits are as follows:

(i) CDs can be issued to individuals, corporations, companies, trusts, funds, associates, etc.

(ii) NRIs can subscribe to CDs on non-repatriable basis.

(iii) CDs attract stamp duty as applicable to negotiable instruments.

(iv) Banks have to maintain SLR and CRR on the issue price of CDs. no ceiling on the amount to be issued.

(v) The minimum issue size of CDs is rs1 lakh and in multiples thereof.

(vi) CDs are transferable by endorsement and delivery.

(vii) The minimum lock-in-period for CDs is 15 days.

3. (a) Workings:

Dr. Profit & Loss A/C Cr.

Particulars	₹	Particulars	₹
To Dividend	1,84,000	By Bal. b/f	1,28,000
To Loss on sale of Machinery	16,000	By Profit on Redemption	6,400
To Prov. For Tax	72,000	By Fund from Operation	4,09,600
To Loss on sale of Investment	8,000	(bal.fig)	
To Prov. for Depreciation	80,000		
To Bal c/f	1,84,000		
	5,44,000		5,44,000

Dr. 10% Debenture A/C Cr.

Particulars	₹	Particulars	₹
To Bank A/c	1,53,600	By Bal. b/f	7,20,000
To Profit & Loss	6,400		
To Bal c/f	5,60,000		
	7,20,000		7,20,000

Dr. Machinery A/C Cr.

Particulars	₹	Particulars	₹
To Bal b/f	4,16,000	By Machinery Disposal	96,000
To Bank A/c	24,000		
To Bank A/c (bal.fig)	2,16,000	By Bal c/f	5,60,000
	6,56,000		6,56,000

Dr. Provision for Tax A/c Cr.

Particulars	₹	Particulars	₹
To Bank	80,000	By Bal. b/f	1,04,000
		By Profit & Loss	72,000
To Bal c/f	96,000	(bal.fig)	
	1,76,000		1,76,000

Dr. Investment A/C Cr.

Particulars	₹	Particulars	₹
To Bal b/f	8,80,000	By Bank	2,80,000
		By Profit & Loss	8,000
		By Bal c/f	5,92,000
	8,80,000		8,80,000

Dr. Machinery Disposal A/C Cr.

Particulars	₹	Particulars	₹
To Machinery	96,000	By Provision for Dep.	48,000
		By Bank	32,000
		By Profit & Loss	16,000
	96,000		96,000

Dr. Provision for Depreciation A/C Cr.

Particulars	₹	Particulars	₹
To Machinery Disposal	48,000	By Bal. c/f	3,20,000
To Bal c/f	3,52,000	By Profit & Loss	80,000
	4,00,000		4,00,000

XYZ Ltd.
Cash Flow Statement
For the Year ended on 31.03.2021

Particulars	₹	₹
I. Cash Flow from Operating Activities:		
Fund from Operation	4,09,600	
(-) Increase in Inventory	1,92,000	
(+) Decrease in Trade Receivables	1,92,000	
(-) Increase in Prepaid Expenses	8,000	
(-) Decrease in Trade Payables	56,000	
C/F after working capital changes	3,45,600	
(+) Debenture Interest	72,000	
	4,17,600	
(-) Taxes paid	80,000	
C/F from operating activities		3,37,600

II. Cash Flow from Investing Activities:		
Machinery purchased	(24,000)	
Machinery sold	32,000	
Sale of investment	2,80,000	
Purchase of machinery	(2,16,000)	72,000
III. Cash Flow from Financing Activities		
Dividend Paid	(1,84,000)	
Debenture redeemed	(1,53,600)	
Debenture interest paid	(72,000)	(4,09,600)
(+) Opening cash and cash equivalent		Nil
Closing cash and cash equivalent		7,20,000
		7,20,000

(b) As per Altman's Model (1968) of Corporate Distress Prediction:

$Z = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 1.0\ X_5$

Here, the five variables are as follows:

X_1 = Working Capital to Total Assets = 30%

X_2 = Retained Earnings to Total Assets = 40%

X_3 = EBIT to Total Assets = 25%

X_4 = Market Value of Equity Shares to Book Value of Total Debt =130%

X_5 = Sales to Total Assets = 1.5 times

Hence, Z-score = (1.2 × 30%) + (1.4 × 40%) + (3.3 × 25%) + (0.6 × 130%) + (1 × 1.50)

= 0.36 + 0.56 + 0.825 + 0.78 + 1.50

= 4.025

Comment: As the calculated value of Z-score is much higher than 2.99, it can be strongly predicted that the company is a non-bankrupt company.

4. (a)

Calculation of the Cost of Equity:	₹
Equity Share	4,00,000
Reserves and Surplus	2,60,000
Equity (Shareholder's) Fund	6,60,000

Book Value Per Share = 6,60,000/40,000 = ₹ 16.50.

Equity Dividend Per Share = 12/100 ×10 = ₹ 1.20

Therefore, Cost of Equity (%) = 1.20/16.50 × 100 = 7.273%

Computation of Weighted Average Cost of Capital:

Type of Capital	Amount (₹)	Before Tax	After Tax	Weighted Average Cost %
Equity funds	6,60,000	7.273%	7.273%	48,000
Debentures	1,70,000	8%	4%	6,800
Total	8,30,000			54,800

Weighted Average Cost of Capital = 54800/8,30,000 × 100 = 6.602%.

(b) Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset. When combining multiple data sources, there are many opportunities for data to be duplicated or mislabeled. If data is incorrect, outcomes and algorithms are unreliable, even though they may look correct. There is no one absolute way to prescribe the exact steps in the data cleaning process because the processes will vary from dataset to dataset.

Ultimately, having clean data would boost overall productivity and provide with the greatest quality information for decision-making. Benefits include:

(i) Error correction when numerous data sources are involved.

(ii) Fewer mistakes result in happier customers and less irritated workers.

(iii) Capability to map the many functions and planned uses of your data.

(iv) Monitoring mistakes and improving reporting to determine where errors are originating can make it easier to repair inaccurate or damaged data in future applications.

(v) Using data cleansing technologies will result in more effective corporate procedures and speedier decision-making.

5. (a) (i) Given, Cost of Capital (k) = 18% = 0.18

Return on Investment (r) = 24% = 0.24

Earnings per share (E) = (10,00,000 × 0.24)/1,00,000 = ₹2.40

Retention ratio (b) = 50% = 0.50

As per Gordon's Model, value per share = $P = \frac{E\,(1-b)}{k-b\times r} = \frac{2.40\,(1-0.5)}{0.18-0.5\times 0.24}$ = ₹20

If payout ratio (1 – b) = 10% i.e., 0.10, then, retention ratio (b) = 90% = 0.90

Value per share = $\frac{2.40\,(1-0.9)}{0.18-0.9\times 0.24}$ = (-) ₹6.67

Now, if payout ratio (1 – b) = 90% i.e., 0.90, then, retention ratio (b) = 10% = 0.10

Value per share = $P = \frac{2.40\,(1-0.1)}{0.18-0.1\times 0.24}$ = ₹13.85

In this case r > k, so the firm is a growth firm. Hence, according to Gordon Model as the retention ratio increases the value per share also increases. Therefore, the optimal policy for the firm is to retain as much as possible. However, according to Gordon, maximum retention ratio should be lower than k/r i.e., 0.18/0.24 = 2/3.

(ii) As per Walter's Model, value per P = $\frac{D+\frac{r}{k}(E-D)}{k}$

where P = Market price per share; D = Dividend per share; E = Earnings per share; r = Rate of Return on Investment; k = Cost of Capital

Here, r = 20% or 0.20, k = 16% or 0.16

E = [30 – (100 × 12%)]/3 = ₹6

Let D/P ratio is x

So, D = ₹6 × x = ₹6x

Conditionally, P = $\frac{D+\frac{r}{k}(E-D)}{k}$

or, 42 = $\frac{6x+\frac{0.20}{0.16}(6-6x)}{0.16}$

or, x = 0.52

So, the required dividend payout ratio is 52%.

(b) Following are the key factors that an analyst should keep in mind during data visualization to avoid common errors:

i) Understanding the audience:

Before incorporating the data into visualisation, the objective should be fixed, which is to present large volumes of information in a way that decision-makers can readily ingest. A great visualisation relies on the designer comprehending the intended audience and executing on three essential points:

a) Who will read and understand the material and how will they do so? Can it be presumed that it understands the words and ideas employed, or if there is a need to provide it with visual cues (e.g., a green arrow indicating that good is ascending)? A specialist audience will have different expectations than the broader public.

b) What are the expectations of the audience, and what information is most beneficial to them?

c) What is the functional role of the visualisation, and how may users take action based on it? A visualisation that is exploratory should leave viewers with questions to investigate, but visualisations that are instructional or confirmatory should not.

ii) Setting up a clear framework

The designer must guarantee that all viewers have the same understanding of what the visualisation represents. To do this, the designer must establish a framework consisting of the semantics and syntax within which the data information is intended to be understood.

Lines and bars are basic, schematic geometric forms that are important to several types of visualisations; lines join, implying a relationship. On the other hand, bars confine and divide. In experiments, when participants were asked to analyse an unlabeled line or bar graph, they viewed lines as trends and bars as discrete relations, even when these interpretations were inconsistent with the nature of the underlying data.

iii) Telling a story

In its instructional or positive role, visualisation is a dynamic type of persuasion. There are few kinds of communication as convincing as a good story. To do this, the visualization must give the viewer a story. Stories bundle information into a framework that is readily recalled, which is crucial in many collaborative circumstances in which the analyst is not the same person as the decision-maker or just has to share knowledge with peers. Data visualisation lends itself nicely to becoming a narrative medium, particularly when the tale comprises a large amount of data.

In order to comprehend the data and connect with the visualization's audience, creators of visualisations must delve deeply into the information. Good designers understand not only how to select the appropriate graph and data range, but also how to create an engaging story through the visualisation.

6. (a) Calculation of cash flow before depreciation and tax (CBDT)

Year	Sales (Units)	Sales @ ₹ 20 p.u (₹)	Variable Cost @ ₹ 10 p.u (₹)	Fixed Cost excluding Depreciation (₹)	CBDT (₹)
1	30000	6,00,000	3,00,000	1,20,000	1,80,000
2	40000	8,00,000	4,00,000	1,20,000	2,80,000
3	40000	8,00,000	4,00,000	1,20,000	2,80,000
4	20000	4,00,000	2,00,000	1,20,000	80,000
5	20000	4,00,000	2,00,000	1,20,000	80,000

Note: Depreciation = ₹ (4,50,000 – 50,000)÷5 = ₹ 80,000 p.a.

Fixed cost excluding depreciation = ₹ (2,00,000 – 80,000) = ₹ 1,20,000

Calculation of cash flow after tax (CFAT)

Year	CBDT (₹)	Depreciation	Taxable Profit (₹)	Tax (₹)	CFAT excluding Loss of Contribution	Loss of Contribution (₹)	CFAT (₹)
(1)	(2)	(3)	(4)	(5)	(6) = (2)-(5)	(7)	(8) = (6)+(7)
1	1,80,000	80,000	1,00,000	40,000	1,40,000	20,000	1,20,000
2	2,80,000	80,000	2,00,000	80,000	2,00,000	20,000	1,80,000
3	2,80,000	80,000	2,00,000	80,000	2,00,000	20,000	1,80,000
4	80,000	80,000	Nil	Nil	80,000	20,000	60,000
5	80,000	80,000	Nil	Nil	80,000	20,000	1,10,000*

Note: * the cash flow of fifth year includes ₹ 50,000 scrap value.

Calculation of NPV

Year	CFAT(₹)	PVIF @ 10%	PV of CF
1	1,20,000	0.909	109080
2	1,80,000	0.826	148680
3	1,80,000	0.751	135180
4	60,000	0.683	40980
5	1,10,000*	0.621	68310
Total PV			502230
(-) Initial Investment			450000
NPV			52230

Comment: Since NPV is positive, the proposal may be accepted.

(b) Calculation for DPBP

Year	CIAT (₹)	PVIF @ 10%	PV of CIAT	Cumulative PV
1	10,000	0.909	9090	9090
2	15,000	0.826	12390	21480
3	20,000	0.751	15020	36500
4	25,000	0.683	17075	53575
5	20,000	0.621	12420	65995

From the table it appears that initial investment of ₹ 60000 is recovered along with the interest cost of fund in between 4th and 5th year.

We apply simple interpolation to get

$$\frac{DPBP-4}{5-4} = \frac{60000-53575}{65995-53575}$$

Or, DPBP -4 = 0.52

Or DPBP = 4.52 years

So, the Discounted Payback Period is 4.52 years.

7. (a) Evaluation of proposed credit policies (Amount in ₹ lakh)

	Present	**Proposed (No. of days)**		
	(20)	I (30)	II (40)	III(50)
(a) Sales revenue	60	65	70	74
Less: Variable costs (VC)	42	45.5	49	51.8
Total Contribution	18	19.5	21	22.2
Less: Fixed Cost (FC)	8	8	8	8
Profit	10	11.5	13	14.2
Increase in profit due to increase in total contribution compared to present profit	---	1.5	3	4.2
(b) Investment in debtors/receivables:				
Total costs (V+FC)	50	53.5	57	59.8
Debtors' turnover ratio (DT)				
(360 ÷ Average collection period)	18	12	9	7.2
Average investment in debtors				
(Total cost ÷ DT)	2.78	4.46	6.33	8.31
Additional investment compared to present level	--	1.68	3.55	5.52
Cost of additional investment @25%	--	0.42	0.89	1.38
(c) Incremental profit [(a) - (b)]	--	1.08	2.11	2.82

Recommendation: Policy III (average collection period 50 days) is recommended as it yields maximum profit.

(b) Statement of Determine Net working Capital of Camellia Ltd.

(A) Current Assets	₹	₹
(i) Raw materials (25,000 units × 2 × ₹ 20)		10,00,000
(ii) Work in process		
Raw Materials (12,500 units × ₹ 10)	1,25,000	
Direct Labour (12,500 units × ₹ 2.5)	31,250	
Overhead (12,500 units × ₹ 7.5)	93,750	2,50,000
(iii) Finished Goods (25,000 units × ₹ 40)		10,00,000
(iv) Debtors (3,00,000 × ₹ 40 × 2)/12		20,00,000
(v) Minimum Cash Balance		25,000
Total		42,75,000
(B) Current Liabilities		
(i) Creditors for 1 month (3,00,000 × ₹ 20 × 1)/12		5,00,000
(C) Net Working Capital (NWC) (A-B)		37,75,000

Alternatively, in work-in-process [Item A(iii) above] Raw Materials may be valued at 12,500 units x ₹ 20 = ₹ 2,50,000. Debtors [item A(iv) above] may also be valued at [3,00,000 x ₹ 50 (selling price) x 2] / 12 = ₹ 25,00,000. Calculation of Net Working Capital will change accordingly.

8. (a) (i) Weak AI, also known as Narrow AI or Artificial Narrow Intelligence (ANI), is AI that has been trained and honed to do particular tasks. Most of the AI that surrounds us today is powered by weak AI. This form of artificial intelligence is anything but feeble; it allows sophisticated applications such as Apple's Siri, Amazon's Alexa, IBM Watson, and driverless cars, among others.

Artificial General Intelligence (AGI) and Artificial Super Intelligence (AIS) comprise strong AI (ASI). Artificial general intelligence (AGI), sometimes known as general artificial intelligence (AI), is a hypothetical kind of artificial intelligence in which a machine possesses human-level intellect, a self-aware consciousness, and the ability to solve problems, learn, and plan for the future. Superintelligence, also known as Artificial Super Intelligence (ASI), would transcend the intelligence and capabilities of the human brain. Despite the fact that strong AI is yet totally theoretical and has no practical applications, this does not preclude AI researchers from studying its development. In the meanwhile, the finest instances of ASI may come from science fiction, such as HAL from 2001: A Space Odyssey, a superhuman, rogue computer aide.

(ii) Given that deep learning and machine learning are frequently used interchangeably, it is important to note the distinctions between the two. As stated previously, both deep learning and machine learning are subfields of artificial intelligence; nonetheless, deep learning is a subfield of machine learning.

Neural networks truly constitute deep learning. "Deep" in deep learning refers to a neural network with more than three layers, which includes inputs and outputs, and may be termed a deep learning method. Typically, this is depicted by the following diagram.

Deep learning and machine learning differ in how their respective algorithms learn. Deep learning automates a significant portion of the feature extraction step, reducing the need for manual human involvement and enabling the usage of bigger data sets. Deep learning may be thought of as "scalable machine learning," as stated by Lex Fridman. Classical or "non-deep" machine learning requires more human interaction to learn. Human specialists develop the hierarchy of characteristics in

order to comprehend the distinctions between data inputs, which often requires more structured data to learn.

Deep machine learning can utilise labelled datasets, also known as supervised learning, to educate its algorithm, although a labelled dataset is not required. It is capable of ingesting unstructured data in its raw form (e.g., text and photos) and can automatically establish the hierarchy of characteristics that differentiate certain data categories from one another. It does not require human interaction to interpret data, unlike machine learning, allowing us to scale machine learning in more exciting ways.

(b) While data analytics is an important tool for decision making, managers should never take an important analysis at face value. A deeper understanding of hidden insights that lie underneath the surface of the data set need to be explored, and what appears on the surface should be looked with some scepticism.

The emergence of new data analytics tools and techniques in financial environment allows the accounting and finance professionals to gain unique insights into the data, but at the same time creating very unique challenges while exercising scepticism. As the availability of data is bigger now, analysts and auditors not only getting more information, but also is facing challenges about managing and investigating red flags.

One major concern about the use of data analytics is the likelihood of false positives, i.e. the data may identify few potential anomalies that could be later identified as reasonable and explained variation of data.

Studies show that the frequency of false positives increase proportionately with the size and complexity of data. Few studies also show that analysts face problems while determining outliers using data analytics tools.

Professional scepticism is an important focus area for practitioners, researchers, regulators and standard setters. At the same time, professional scepticism may result into additional costs e.g. strained client relationships, and budget coverages.

Under such circumstances, it is important to identify and understand conditions in which the finance and audit professionals should apply professional scepticism. There is a requirement to keep a fine balance between costly scepticism and underutilizing data analytics to keep the cost under control.