PART – I
(MCQ Portion)

30 Marks

- ***Answers to MCQs are to be marked on the OMR answer sheet as given on the cover page of the descriptive answer book only. Answer to MCQs, if written inside the descriptive answer book shall not be evaluated.***
- ***Please write and darken correct MCQ booklet number in the OMR answer sheet. The correct MCQ booklet number must also be written in the attendance register.***

Case Scenario-I

Aarav Mehta, an expert in derivatives, provides following data :

Bond Forward ; A mutual fund holds a GoI security (FV ₹ 100, 7.10% p. a. coupon, semi-annual) with current dirty price ₹ 102.80. Next coupon due in 60 days; forward matures in 240 days (only one coupon received before expiry); continuous risk-free rate = 6.10% p. a. The fund proposes a short bond forward.

Currency Forward : An Indian exporter expects USD 2 million after 180 days and wishes to hedge against USD depreciation. Spot = ₹ 95.1237/USD; continuous INR rate = 5.75% p.a.; continuous USD rate = 4.25% p.a.

Assumptions : Actual/365 day-count; continuous compounding where stated; ignore taxes/costs/margins/spreads/counterparty risk; bond prices per ₹ 100 FV.

Exponential values : e^(-0.0100)=0.99002271; e^(0.0401)=1.04092484; e^(0.0074) = 1.00742469

(Round off all intermediate and final calculations to four decimal places.)

From the information given above, choose the correct answer to the Q. No. **1** and **2** :

1. What is the no-arbitrage forward price of the Government security, per ₹ 100 face value, that the mutual fund should use for its proposed short forward contract ? **2**

(A) ₹103.3486

(B) ₹103.0107

(C) ₹99.2929

(D) ₹ 10.6811

2. What are the 180-day USD/INR forward rate and the corresponding rupee proceeds locked in by the exporter under the proposed currency forward hedge ? **2**

(A) ₹ 95.8300 USD; ₹ 19.1660 crore

(B) ₹ 94.4216 USD; ₹ 18.8880 crore

(C) ₹ 96.5680 USD; ₹ 19.3110 crore

(D) ₹ 95.4800 USD; ₹ 19.1010 crore

Case Scenario-II

Kalyan Resources Ltd. (KRL), an Indian multinational with mining operations in Australia, requires GBP-denominated floating-rate finance for its UK expansion. Bridgeworth Engineering plc (BEP), a British engineering company, requires AUD- denominated floating-rate finance for a long-term Australian infrastructure project. Both companies intend to raise funds for five years, with interest payable every six months.

Current spot exchange rate : AUD 1 = GBP 0.5000

Floating-rate borrowing costs available to each company :

Company	AUD Market	GBP Market
KRL	BBSW + 90 bps	SLIBOR + 70 bps
BEP	BBSW + 65 bps	SLIBOR + 35 bps

Funding requirements : KRL requires GBP 50 million; BEP requires AUD 100 million.

Continental Merchant Bank (CMB) proposes an intermediated currency swap under which KRL borrows AUD 100 million and swaps into GBP, and BEP borrows GBP 50 million and swaps into AUD. The agreed principal exchange is based on the prevailing spot exchange rate.

Ignore principal exchanges unless specifically required. Interest is settled every six months on the respective notional principal.

Cash Flow	Currency	Rate
CMB pays KRL	AUD	BBSW + 90 bps
CMB pays BEP	GBP	SLIBOR + 35 bps
KRL pays CMB	GBP	SLIBOR + A bps
BEP pays CMB	AUD	BBSW + R bps

From the information given above, choose the correct answer to the Q. Nos. **3** to **6** :

3. Calculate the maximum permissible value of A such that Kalyan Resources Ltd. (KRL) is not worse off than borrowing directly in the GBP floating-rate market. **1**

(A) 65 bps

(B) 67 bps

(C) 70 bps

(D) 72 bps

4. Calculate the maximum permissible value of R such that Bridgeworth Engineering plc (BEP) is not worse off than borrowing directly in the AUD floating-rate market. **1**

(A) 61 bps

(B) 63 bps

(C) 65 bps

(D) 67 bps

5. Assume A = 67 bps and R = 61 bps. Calculate the six-monthly interest-cost saving available to Kalyan Resources Ltd., compared with direct borrowing in the GBP market. **1**

(A) GBP 5,000

(B) GBP 7,500

(C) GBP 10,000

(D) GBP 15,000

6. Assume A = 67 bps and R = 61 bps. Calculate the six-monthly interest-cost saving available to Bridgeworth Engineering plc, compared with direct borrowing in the AUD floating-rate market. **1**

(A) AUD 20,000

(B) AUD 40,000

(C) AUD 25,000

(D) AUD 30,000

Case Scenario-III

Kaveri Sovereign Bond Fund manages a large portfolio of Government of India (GoI) securities. Ahead of the upcoming RBI Monetary Policy announcement, the investment committee expects an immediate parallel upward shift of 50 basis points in the sovereign yield curve and is reviewing alternative duration-positioning strategies to manage interest- rate risk.

To eliminate first-order interest-rate risk while comparing portfolio structures, the committee constructs two portfolios having identical modified duration :

- Portfolio 1 (Bullet) : 100% investment in the 10-year GoI Security.
- Portfolio 2 (Barbell) : Investment in the 2-year and 20-year GoI Securities, with portfolio weights selected so that its modified duration equals that of Portfolio 1.

Security	Coupon	Modified Duration	Convexity
2-year GoI	6.50%	1.86	5.2
10-year GoI	5.75%	9.52	104.8
20-year GoI	6.25%	16.23	292.8

(Round off all calculations to two decimal places)

From the information given above, choose the correct answer to the Q. Nos. **7** to **10** :

7. Calculate the proportion of Portfolio 2 to be invested in the 2-year GoI security so that the modified duration of Portfolio 2 equals the modified duration of Portfolio 1. **1**

(A) 46.69%

(B) 50.00%

(C) 53.31%

(D) 58.75%

8. Using the weight determined for the 2-year GoI security, calculate the proportion to be invested in the 20-year GoI security and verify the resulting modified duration of Portfolio 2. **1**

(A)46.69% in the 20-year security; Portfolio 2 modified duration = 8.57

(B)50.00% in the 20-year security; Portfolio 2 modified duration = 9.05

(C)53.31% in the 20-year security; Portfolio 2 modified duration = 9.52

(D)53.31% in the 20-year security; Portfolio 2 modified duration = 13.10

9. Using the duration-matching weights, calculate the weighted convexity of Portfolio 2. **1**

(A) 104.80

(B) 149.00

(C) 158.52

(D) 292.80

10. Calculate the excess weighted convexity of Portfolio 2 (Barbell) over Portfolio 1 (Bullet). **1**

(A) 53.72

(B) 46.69

(C) 62.20

(D) 187.75

Case Scenario-IV

An investor has the portfolio shown below. The beta of KC Ltd. is unknown.

	Number of Shares (lakh)	Price per share (₹)	Beta
RP Ltd.	8	187.5	1.40
BP Ltd.	10	275	1.20
KC Ltd.	6	125	?

The investor thinks that the risk of portfolio is very high and wants to reduce the portfolio beta; for this purpose proportionate quantity of shares will be sold. The investor considered two alternatives to reduce portfolio risk :

- Alternative I : Proportionately dispose of a part of the portfolio and invest the proceeds in risk-free securities. He invested ₹ 15 crore in Treasury Bills and achieved the desired portfolio beta.
- Alternative II : Instead of selling shares, he sold 150 Nifty Futures contracts (Nifty Futures = 26,000; Contract multiplier = ₹ 50), achieving exactly the same target beta.

From the information given above, choose the correct answer to the Q No. **11** to **14** :

11. What is the original portfolio beta and beta of KC Limited ? **2**

(A) 1.2165 and 0.91

(B) 1.1250 and 0.30

(C) 1.30 and 1.47

(D) 1.2750 and 1.30

12. What is the targeted portfolio beta achieved under both alternatives ? **1**

(A) 0.85

(B) 0.79

(C) 0.89

(D) 0.91

13. After proportionately selling part of the equity portfolio and investing in Treasury Bills, the investor still has _____ shares in RP Limited and _____ shares in BP Limited. **2**

(A) 4,80,000 shares in RP Limited and 6,00,000 in BP Limited

(B) 5,60,000 shares in RP Limited and 7,00,000 in BP Limited

(C) 2,40,000 shares in RP Limited and 3,00,000 in BP Limited.

(D) 8,00,000 shares in RP Limited and 10,00,000 shares in BP Limited

14. Which of the following statements are correct ? **1**

(i) Selling part of the equity portfolio proportionately does not change the beta of the remaining equity portfolio.

(ii) Investment in Treasury Bills reduces the overall portfolio beta because Treasury Bills normally have zero beta.

(iii) Shorting stock index futures changes the composition of the equity portfolio.

(A) (i) and (ii) only

(B) (ii) and (iii) only

(C) (i), (ii) and (iii)

(D) (i) and (iii) only

Case Scenario-V

ANP Ltd., an Indian company, has imported goods from a US supplier for USD 5,01,840.

The amount is payable after six months. The following information is available :

Spot rate	₹ 88.20 - ₹ 88.40 per USD	
6 months forward rate	₹ 89.10 - ₹ 89.80 per USD	
	India	US
Borrowing rates	7.50% p.a.	6% p.a.
Deposit rate	6% p.a.	4.0% p.a.
USD call option contract size	USD 10,455	
Exercise price	₹ 90 per USD	
6-month USD call option premium	₹ 1.20 per USD	

From the information given above, choose the correct answer to the Q. No. **15** to **19** :

15. What will be the rupee cost of the USD payable under forward cover ? **1**

(A) ₹ 4,51,23,780

(B) ₹ 4,50,65,232

(C) ₹ 4,51,65,600

(D) ₹ 4,47,13,944

16. What is the approximate INR cost of the USD payable under a money-market hedge ? **1**

(A) ₹ 4,57,67,808

(B) ₹ 4,50,65,232

(C) ₹ 4,51,23,780

(D) ₹ 4,55,67,072

17. Under the currency option hedge, what is the effective cost per USD in INR, including the option premium ? **1**

(A) ₹ 91.20

(B) ₹ 87.20

(C) ₹ 89.80

(D) ₹ 90.00

18. The six-month spot rate for ANP Ltd. is expected to be ₹ 86/USD with a probability of 40% and ₹ 94/USD with a probability of 60%. What is the expected INR cost if ANP Ltd. remains unhedged ? **1**

(A) ₹ 4,55,67,072

(B) ₹ 4,51,65,600

(C) ₹ 4,37,60,448

(D) ₹ 4,31,58,024

19. ANP Ltd. has a USD call option with an exercise price of ₹ 90/USD and a premium of ₹ 1.20/USD. The six-month spot rate is expected to be ₹ 86/USD with a probability of 40% and ₹ 94/USD with a probability of 60%.

Which of the following statements are correct ? **2**

(i) At ₹ 86/USD, the USD call option is out-of-the-money; therefore, ANP Ltd. should not exercise the option, and its effective cost including the premium will be ₹ 87.20/USD.

(ii) At ₹ 94/USD, the USD call option is in-the-money; therefore, ANP Ltd. should exercise the option, and its effective cost including the premium will be ₹ 91.20/USD.

(iii) The probability-weighted expected cost under the currency option hedge is approximately ₹ 4,49,14,680.

(iv) The probability-weighted expected effective exchange rate under the currency option hedge is approximately ₹ 89.50/USD.

(A) (i), (ii), (iii) and (iv)

(B) (i), (ii) and (iii) only

(C) (i), (iii) and (iv) only

(D) (i) and (ii) only

Case Scenario-VI

JBC Ltd. is evaluating a five-year investment project. Selling price per unit is ₹ 1,000 and variable cost per unit is ₹ 600. Expected annual variable cost is ₹ 3.60 crore. Annual depreciation for tax purposes is ₹ 50 lakh. The corporate tax rate is 30%, and the after-tax salvage value at the end of Year 5 is ₹ 40 lakh. No working-capital investment is required, and all operating cash flows are received at the end of each year.

The following sensitivity factors have been estimated :

- Sales volume sensitivity factor with respect to NPV = +5.00. A 1% increase in sales volume increases NPV by ₹ 6.06 lakh.
- Annual fixed cost sensitivity factor with respect to NPV = –1.00.
- Cost of capital sensitivity factor with respect to NPV = –2.40.

For all sensitivity factors, a 1% change in the specified variable is assumed to occur independently, with all other variables remaining constant. The sensitivity factor represents the percentage change in the relevant project outcome divided by the percentage change in the specified variable. The IRR sensitivity factor is expressed in relative percentage terms and not in percentage points.

The project's IRR is 16% and its cost of capital is 12%. The five-year PV annuity factor at 12% is 3.6048.

(Round-off all calculations to two decimal places)

From the information given above, choose the correct answer to the Question No. **20** to **23** :

20. By considering the sales-volume sensitivity factor with respect to NPV, what will be the NPV of the project ? **1**

(A) ₹ 101.00 lakh

(B) ₹ 121.20 lakh

(C) ₹ 132.50 lakh

(D) ₹ 145.20 lakh

21. By considering the sensitivity related to fixed cost, what will be the approximate annual fixed operating cost of the project ? **1**

(A) ₹ 42.03 lakh

(B) ₹ 45.60 lakh

(C) ₹ 48.03 lakh

(D) ₹ 52.50 lakh

22. What will be the approximate annual operating cash flow and initial investment of the project, respectively ? **2**

(A) ₹ 141.97 lakh and ₹ 428.50 lakh

(B) ₹ 145.20 lakh and ₹ 435.60 lakh

(C) ₹ 149.38 lakh and ₹ 439.98 lakh

(D) ₹ 152.40 lakh and ₹ 451.20 lakh

23. If the cost of capital increases by 2% relative to its existing level, what will be the revised cost of capital and approximate NPV, respectively ? **2**

(A) 14.00% and ₹ 116.40 lakh

(B) 12.24% and ₹ 115.38 lakh

(C) 12.24% and ₹ 116.40 lakh

(D) 14.00% and ₹ 121.20 lakh

PART – II
(Descriptive Portion)

70 Marks

(Candidates are required to give descriptive answers for this part inside the answer book)

1. Question paper comprises 6 questions. Answer Question No. 1 which is compulsory and any 4 out of the remaining 5 questions.

2. Working notes should form part of the answer.

3. Answers to the questions are to be given only in English except in the case of candidates who have opted for Hindi Medium. If a candidate has not opted for Hindi Medium, his/her answers in Hindi will not be evaluated.

4. Candidates are required to write the question number legibly.

1. (a) An investor participates in the RBI primary auction for a 364-day Treasury Bill having a Face Value of ₹ 5,00,000, at a yield of 6.50% p.a. At the date of the original investment, a 91-day Treasury Bill is also available at a yield of 6.35% p.a. **1+1+1+1+2=6**

The investor chooses the 364-day Treasury Bill. After holding it for 91 days, the investor sells it in the secondary market. On the date of sale, Treasury Bills having a residual maturity of 273 days are trading at a yield of 6.20% p.a. (Use 1 Year = 365 Days).

Required :

(i) Determine the Issue Price paid by the investor for the 364-day Treasury Bill at the primary auction.

(ii) Determine the Secondary Market Sale Price realized by the investor after holding it for 91 days.

(iii) Determine the annualized yield actually realized by the investor on sale of the Treasury Bill after the 91-day holding period.

(iv) Determine the price at which the alternative 91-day Treasury Bill could have been purchased on the date of the original investment.

(v) With the benefit of the actual secondary-market yield prevailing after 91 days, compare the return generated by investing in the 364-day Treasury Bill and selling it after 91 days, and investing in the 91-day Treasury Bill and holding it to maturity. Identify which strategy generated the superior return and briefly explain the reason for the difference.

(Round off all intermediate and final calculations to two decimal places.)

1. (b) SRS Ltd. is planning to import a machine from Japan costing ¥ 1,680 lakh. The company can avail of a domestic loan at 18% p.a., compounded quarterly, to finance the import. Alternatively, the Tokyo branch of an India-based bank offers 180-day credit at 2% p.a. against the opening of an irrevocable letter of credit. **4**

The following information is available :

- Spot 1 USD = ₹ 88.00
- Spot 1 USD = ¥ 165.00
- 180-day forward 1 USD = ₹ 90
- 180-day forward 1 USD = ¥ 172.80
- LC commission : 2% p.a. of the LC amount, prorated for 180 days
- Domestic bank processing fee : 0.50% of the loan amount

Required :

Evaluate the financing alternatives and advise SRS Ltd. whether it should accept the Tokyo branch's credit offer. Your recommendation should be supported by the effective rupee cost of each alternative and the resulting financial saving.

1. (c) Vanguard Synthetics Ltd. has formulated an aggressive strategy to capture rising market demand. The CEO believes that the strength of this strategy alone will ensure sustained long-term growth. However, the company's manufacturing facilities are operating at full capacity, and no immediate expansion of infrastructure is planned. **2+2 =4**

Separately, the Board proposes to move from merely maintaining the company's overall stock of capital assets to adopting a strong concept of sustainability.

Required :

(i) Critically evaluate whether a growth strategy alone can ensure sustainable long-term growth in the circumstances described.

(ii) Examine whether maintaining the overall stock of capital assets would satisfy the Board's proposed objective, distinguishing among the very weak, weak, and strong concepts of sustainability.

2. (a) JalDhara Irrigation Infrastructure Ltd. (JIIL), an NSE-listed agri-infrastructure company, is evaluating the KGCL Project under the commences immediately and is completed over three years. Commercial operations begin in Year 4 and continue in perpetuity. **2+4 =6**

Project Cash Flows (₹ crore)

Year	0	1	2	3	4	5	6 → ∞
Land & mobilisation	(53)	–	–	–	–	–	–
Development cost	–	(40)	(55)	(30)	–	–	–
Operating cash flow (after tax)	–	–	–	–	85	110	Grows @ 6% p.a.

Capital Structure & Market Data

- Equity shares outstanding : 12 crore
- Current market price : ₹ 145 per share

- Existing debt : ₹ 380 crore
- Geared cost of equity (K_e) : 16% p.a.
- Market borrowing cost (pre-tax K_d) : 11% p.a.
- Risk-free rate (R_f) : 7% p.a.
- Expected market return (R_m) : 13% p.a.
- Corporate tax rate : 25%

Financing Plan - The project cost of ₹ 178 crore will be financed by :

- NABARD LTIF loan : ₹ 120 crore @ 8% p.a.
- Market-rate bank loan : ₹ 58 crore @ 11% p.a.

Both loans are drawn immediately, carry annual interest payments and are repaid through a bullet payment at the end of Year 5. Loan processing and legal costs of ₹ 3.50 crore are incurred immediately and are tax-deductible.

Distress Risk : The rating agency estimates a 3% probability of financial distress during the construction and ramp-up period. In the event of distress, project operating assets are expected to realise only 70% of their unlevered value.

Additional Assumptions :

1. Assume risk-free rate as the cost of debt for ungearing.
2. Interest tax shields and the contractual interest-rate subsidy shall be discounted at the cost of the respective debt tranche.
3. The tax benefit on issue costs is realised at the end of Year 1.

Required :

(i) Using the data provided, evaluate the ungeared cost of equity and the base-case all-equity Net Present Value for JIIL's proposed project.

(ii) Using the data provided, evaluate the Adjusted Present Value after incorporating financing side-effects and expected financial distress cost, and recommend whether JIIL should proceed with the project.

(Round off all intermediate and final calculations to two decimal places.)

PV Factor Table

Rate	Basis	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
14.14%	PVIF	0.8761	0.7676	0.6725	0.5892	0.5162
14.74%	PVIF	0.8715	0.7596	0.6620	0.5770	0.5028
15.34%	PVIF	0.8670	0.7517	0.6517	0.5650	0.4899
8%	PVIFA	—	—	—	—	3.993
11%	PVIFA	—	—	—	—	3.696
7%	PVIF	0.935	—	—	—	—

2. (b) An investor had purchased a 3-month call option on the equity shares of KG Limited (KGL) for ₹ 10, with a strike price of ₹ 260. The current market price of KGL stock is ₹ 250. The market analysts expect that the KGL stock will trade between ₹ 220 to ₹ 300 in three months' time from now. However, an investor is not sure of what will be the spot price of KGL stock at the time of expiry of his option contract i.e. after three months. **1+1+2=4**

Therefore, the investor has done an extensive market research and gathered the information about the possible price range of KGL stock price. As per his analysis the expected stock price of KGL and the related probability is given below.

Expected Price (₹)	240	260	280	300	320	340
Probability	0.05	0.10	0.25	0.35	0.20	0.05

The investor wants to calculate the following to understand possible outcome of the call option he had purchased :

(i) Expected share price at the end of 3 months.

(ii) Value of the call option at the end of 3 months, if the exercise price prevails.

(iii) If the option is held to its maturity, the expected value of the call option.

2. (c) **Scenario 1 :** **2+2 =4**

OM Finance Ltd. securitized Unsecured Personal Loans with an average interest rate of 13% p.a. Due to increased competition and regulatory changes, banks have started offering personal loan refinancing at 10% p.a. Many creditworthy borrowers are now prepaying their existing loans to avail cheaper refinancing options, causing the SPV to receive collections much faster than anticipated.

Scenario 2 :

MD Finance Ltd. has securitized a pool of Car Loans with floating interest rates (Repo Rate + 3.0%). The SPV has issued Pass-Through Certificates to investors with a fixed coupon of 8.0% per annum. Recently, RBI increased the repo rate by 50 basis points to control inflation.

Categorize the specific type of market risk in each of the above independent securitization scenarios, providing brief justification for your answer.

3. (a) Bharat Engineering Ltd. (BEL), an Indian manufacturer, is negotiating an export contract with a first-time customer in Kalinda. BEL will receive KLR 165,000,000 after three months and requires immediate short-term finance equal to the full spot rupee value of the receivable. **6**

Exchange rates (KLR per ₹ 1)

Particulars	Bid	Ask
Spot	64.20	65.10
3-month Forward	66.80	68.15
6-month Forward	69.40	70.90

Rupee interest rates: Borrowing 9.75% p.a. ; Investing 6.60% p.a. Alternative I : Export Credit Insurance with Forward Cover: Premium 1.15% of the spot rupee equivalent. Covers 95% of loss from political risk; 90% of loss from commercial default. Admissible claims settled after six months.

Alternative II : Non-Recourse Export Factoring: Guaranteed proceeds ₹ 24,70,000 after three months if paid on time; ₹ 23,80,000 after six months on commercial default. Immediate finance of 80% of ₹ 24,70,000 at 9.50% p.a. Admin fee 2.75% of ₹ 24,70,000. Any balance of BEL's working-capital requirement not covered by the factor's advance is met through BEL's own short-term borrowing.

Alternative III : Confirmed Irrevocable Documentary LC : Incorporates a 90-day bill discountable immediately in Kalinda at 21% p.a. (360-day convention). LC fees ₹ 45,000.

There is a 95% probability of normal payment after three months and a 5% probability of commercial default. No political-risk event is expected. For the purpose of this question, under Alternative I, assume that, in the event of commercial default, the three-month forward contract is cancelled without gain or loss and the insured claim is covered using a six-month forward contract.

Assumptions :

(i) Insurance premium, admin fee and LC fee require no separate financing;

(ii) Taxes and regulatory compliance costs are ignored.

Required :

Evaluate the three alternatives and recommend the most beneficial alternative to BEL. Show all workings and state clearly any assumptions made.

3. (b)A Mutual Fund Advisor is interested in understanding the performance of two close ended equity Mutual Fund Schemes viz; Amaze Growth Fund and Blue-Chip Fund. **4**

The Net Asset Value (NAV) (beginning of the month) of Amaze Growth Fund is ₹ 125.50, which contains 97% of equity investments and the remaining 3% is in cash. Similarly, Blue-Chip Fund's NAV (beginning of the month) is ₹ 95.25, which contains 99% of equity investments and the balance 1% is in cash.

Following is other information provided :

Particulars	Equity Mutual Fund Schemes	
	Amaze Growth Fund	Blue-Chip Fund
Sharpe Ratio	1.5	1.75
Treynor's Ratio	12	15
Standard Deviation of Fund Returns	8.5%	7%

There is no change in portfolios during the next one month and annual average cost is ₹ 6 per unit for both the schemes.

If the equity share market increases by 5% within a month, calculate the expected NAV of the above two mutual fund schemes at the end of the month.

Note : Consider 12 months in a year and ignore number of days for particular month.

3. (c) Mr. Raghav, a newly appointed quantitative analyst at Zenith Capital, proposes a new algorithmic trading desk to the Chief Investment Officer (CIO). He claims to have cracked market patterns and makes the following three assertions to justify his strategy : **3+1 =4**

1. "By analyzing daily and weekly price data of mid-cap stocks, I have found that a price change in one period is highly correlated with the price change in a subsequent period. By perfectly timing these time lags, we can predict short-term trends and generate assured profits."

2. "I have mapped the series of consecutive 'up' (+) and 'down' (–) days for various stocks. My analysis shows that the total number of these sequences (where signs do not differ) in the market is statistically very different from a purely random series, allowing us to anticipate when a new sequence will begin."
3. "My algorithm employs a strict rule: buy a stock when it rises by at least 5%, and sell it immediately when it drops by at least 5% from its subsequent high. My back-testing proves that this active strategy will heavily outperform a passive 'buy and hold' approach, even after paying heavy brokerage commissions on the frequent transactions."

Requirement : As a financial consultant well-versed in the Efficient Market Theory, evaluate the empirical validity of Mr. Raghav's three assertions based on the standard tests used to verify the weak form of market efficiency, and give your overall conclusion on whether the proposed algorithmic trading desk should be approved.

4. (a) GHL Ltd. currently pays a dividend of ₹ 14 per share, and its current market price is ₹ 860 per share. The dividend is expected to grow annually on a compounded basis for the next three years. There is a 60% probability that the annual compounded growth rate will be 8% throughout the three-year period and a 40% probability that it will be 10% throughout the three-year period. These growth scenarios are mutually exclusive and exhaustive. Assume that the applicable growth rate under each scenario will continue indefinitely from Year 4 onwards. **5**

The present Stock Market Index is 22,640. There is an 80% probability that it will reach 32,000 after three years and a 20% probability that it will remain at 22,640. Assume these are the only possible outcomes. The risk-free rate is 7% p.a., and GHL's beta is 1.50.

(Round off the interim and final calculations to four decimal places.)

Required :

(i) Calculate the expected dividend per share after three years by incorporating the probability of each growth scenario and annual compounding.

(ii) Assess GHL's required return using CAPM and calculate its probability-weighted terminal value at the end of Year 3 using the Gordon Growth Model under the two growth scenarios.

(iii) Recommend whether to Buy, Hold or Sell GHL by comparing its probability-weighted present intrinsic value with the current market price, and interpret the results.

4. (b) B Limited is medium-size diversified manufacturing company engaged in plastic products for industrial applications. The company has been using traditional accounting measures such as Net Profit, Earnings Per Share (EPS), Return on Capital Employed (RoCE) and Return on Sales (RoS) to evaluate the company performance and also its divisions. **5**

However, the CFO of B Limited observed that, a division may report high accounting profit while still failing to generate sufficient returns to reward investors for the capital employed. Therefore, the CFO is considering adopting Economic Value Added (EVA) as a key performance and valuation tool. The CFO believes that EVA not only provides a better measure of managerial performance but can also be used to estimate the intrinsic value of the company.

The financial information of B Limited for the recent financial year 2025-26 is provided below :

Balance Sheet of B Limited as on 31st March, 2026

Equity and Liabilities	**(₹ in lakhs)**
Shareholders' Funds :	
Paid-up capital of ₹ 10 of 10,00,000 shares	100
Reserves & Surplus	80
Total Shareholders' Funds	**180**
Non-Current Liabilities	
Long-term Debt @ 12% p. a	90
Current Liabilities	
Short-term Borrowings	40
Accounts Payables	35
Other Current Liabilities	20
Total Current Liabilities	**95**
Total Liabilities	**365**
Assets	
Non-Current Assets :	
Land & Building	120
Plant, Machinery & Equipment	100
Furniture and Fixtures	10
Total Non-Current Assets	**230**
Current Assets :	
Inventory	55
Trade Receivables	50
Cash & Bank Balance	25
Other Current Assets	5
Total Current Assets	**135**
Total Assets	**365**

Income and Expenditure Statement of B Limited for the Financial Year 2025-26

Particulars	Amount (₹ in lakhs)
Revenue from Operations	400
Other Income	10
Total Income	410
Cost of Materials / Purchases	210
Employee Expenses	55
Manufacturing & Operating Expenses	35
Selling & Administrative Expenses	25
Depreciation	15
Interest Expense	10
Total Expenditure	350
Profit Before Tax	60
Tax Expense	15
Profit After Tax	45

Note :

1. Provision for bad debts of ₹ 5 lakhs is included in the Selling and Administrative Expenses and the same amount is reduced from Trade Receivables.
2. The company's pre-tax debt is 12% and tax rate is 25%.

The company uses Capital Asset Pricing Model (CAPM) to estimate its cost of equity. Risk-free (R_f) rate is 8%, Beta (β) of the stock of B Limited is 1.25, the Market Return (R_m) is 16%.

You are required to compute the Economic Value Added of B Limited for the year 2025-26.

4. (c) Mr. Hemant is holding 100 equity shares of Vee Ltd. which is being quoted at ₹ 2,100 per share. He is interested in hedging downside risk of his holding as he is going to sell them after 2 months. A 2-month Call option is available at a premium of ₹ 60 per share and a 2-month put option is available at a premium of ₹ 50 per share. The strike price in both cases is ₹ 2,200. **4**

You are required to :

(i) Suggest the position Mr. Hemant should take in the option market to hedge his holding in the Vee Ltd.

(ii) Calculate his final position if after 2 months i.e., on the day of exercise the actual market price of per share of Vee Ltd. happens to be ₹ 2000, 2100, 2200, 2300 and 2400.

(iii) Give your observation on the value of holding of Mr. Hemant in Vee Ltd. due to hedging.

OR

4. (c) Examine the following statements and determine whether each statement is True or False. Give a suitable reason for your answer. **1×4 =4**

(i) VC investment generally involves investing in early-stage businesses with high growth potential, but also with a relatively high risk of failure.

(ii) VC due diligence is performed only to assess the financial statements of the start-up and does not normally consider the promoter, business model, technology, market potential, or legal risks.

(iii) VC investors generally seek an exit through mechanisms such as IPO, strategic sale, secondary sale, or acquisition, rather than necessarily holding the investment indefinitely.

(iv) A venture capital investor normally provides funds to a start-up without acquiring any ownership interest or requiring any participation in the management or strategic decisions of the venture.

5. (a) Vasudhara Global Industries Ltd. (VGIL) is an Indian multinational headquartered in Mumbai, engaged in manufacturing and export of specialty chemicals and industrial coatings. It has wholly owned subsidiaries in : **8**

- Singapore (SGD functional currency) — specialises in industrial solvents
- Germany (EUR functional currency) — specialises in performance coatings

Treasury policy : (i) evaluate alternatives on consolidated Group cash cost; (ii) net reciprocal inter-company obligations where feasible; (iii) intra-group funding support carries commercial compensation benchmarked to the external alternatives available to the funding and recipient units; (iv) prefer external borrowing only if it yields lower consolidated cost.

Funding Need & Constraints

- Singapore needs SGD 10,000,000 immediately for working capital; cannot borrow locally due to temporary credit restrictions → would borrow offshore for 1 month if no Group support.
- Germany has EUR 5,000,000 surplus but ring-fenced (unavailable for remittance/conversion/pooling).
- Reciprocal obligations maturing in 2 days :
  - o Germany owes HQ EUR 3,000,000 (technical fees)
  - o HQ owes Germany EUR 4,000,000 (imports)
- HQ has unrestricted INR credit access.
- HQ owes Singapore SGD 10,000,000 payable in 1 month for raw materials purchase.

Market Data

Item	Value
SGD/INR spot	₹ 58.4200 per SGD
1-month forward premium on SGD	₹ 0.1800 per SGD
HQ INR borrowing rate	8.50% p.a.
Offshore SGD borrowing rate (Singapore)	5.00% p.a.
Period	1 month = 1/12 year; simple interest
Assumptions	Ignore taxes, transaction costs, exchange controls

Required :

(i) Recommend settlement of reciprocal EUR obligations and quantify residual EUR obligation.

(ii) For each route below, compute consolidated Group cash cost at month-end (INR) and effective INR cost per SGD of the original SGD 10,000,000 and recommend which route should be adopted keeping in mind the overall Treasury Policy of HQ.

Routes :

- **Route 1 :** Singapore borrows SGD 10 million externally for 1 month. HQ enters 1-month forward to buy SGD sufficient to settle its trade payable plus Singapore's external interest. At maturity, Singapore uses remittance to repay external borrowing + interest.
- **Route 2 :** HQ borrows INR for 1 month, converts and immediately remits SGD 10 million to Singapore as advance settlement of trade payable (no discount/compensation). At original due date, no amount payable/ recoverable; HQ repays INR borrowing + interest.
- **Route 3 :** HQ borrows INR for 1 month, converts and advances SGD 10 million to Singapore as interest-bearing intra-group loan. At original due date, loan principal is set off against HQ's SGD trade payable; intra-group interest settled separately at agreed rate.

Note : Consolidated Group cash cost means the total INR cash outflow at month-end.

(iii)Determine the commercially acceptable range for the intra-group lending rate under Route 3 so neither party is worse off than under its own external alternative. Interpret whether the chosen rate within this range alters consolidated Group cost from (ii).

(Round off all intermediate and final calculations to four decimal places.)

5. (b) A financial advisor is evaluating three securities against the BSE Sensex : **6**

Security	(σ)	Correlation with Index
A	24%	0.72
B	16%	0.90
C	14%	0.55

The standard deviation of the market portfolio is 20%. Under the single-index model, the unsystematic variances of A, B and C are 277.40, 48.64 and 136.71, respectively. Residual returns are mutually uncorrelated. An investor initially invests 40% in A, 35% in B and 25% in C.

Required :

(i) Calculate the beta of each security and assess their relative market sensitivity.

(ii) Calculate the initial portfolio beta and total portfolio risk.

(iii)Replace the security having the highest beta. Invest the released amount in the two remaining securities in the 60:40 ratio with 60% allocated to the security having lower beta. Calculate the revised portfolio beta and total standard deviation. Evaluate and recommend whether the restructuring should be adopted.

6. (a) A debt mutual fund holds two bonds X & Y having the following characteristics : **4+3 =7**

Particulars	Bond X	Bond Y
Current Market Price	980	1045
Modified Duration	4.2 Years	6.8 Years
Convexity	28	62

Fund Manager expects a parallel shift in the yield curve and considers two possible scenarios :

Scenario-I : YTM increases by 60 basis points

Scenario-II : YTM decreases by 60 basis points

Fund Manager makes the following statements :

1. "Since Bond Y has higher convexity, its price will fall less than Bond X when interest rate rises"
2. "If interest rates fall, Bond Y should provide a higher percentage price gain than Bond X"
3. "For a small change in interest rates, modified duration is sufficient and convexity may be ignored"

Required :

(i) Calculate the estimated percentage change in the price of each bond under both the scenarios using modified duration and convexity.

(ii) Examine the above three statements and state whether the Fund Manager is correct or incorrect with reasons in light of the calculations done in (i) above.

6. (b) JLP Corp plans to acquire ALP Corp. The following information is available : **1+2 +2+ 2=7**

Particulars	JLP Corp	ALP Corp
Total current earnings	₹ 400 Crore	₹ 100 Crore
Number of outstanding shares	100 crore	50 crore
Market price per share	₹ 48	₹ 14

Required :

(i) Based on the combined P/E ratio of 12 and assuming no synergy gain, recommend the maximum exchange ratio acceptable to JLP shareholders.

(ii) Considering a combined P/E ratio of 8 and a 5% synergy benefit, advise ALP shareholders on the minimum exchange ratio they should accept.

(iii)Assuming no synergy gain, evaluate the P/E multiple at which the maximum exchange ratio acceptable to JLP and the minimum exchange ratio acceptable to ALP become equal.

(iv)If JLP offers an exchange ratio of 0.60:1, with the combined P/E ratio remaining at 12 and no synergy benefit, evaluate whether the proposed acquisition would be EPS accretive or dilutive and advise JLP shareholders accordingly.