Mock Test Paper - Series I: March, 2024

Date of Paper: 6 March, 2024

Time of Paper: 2 P.M. to 5 P.M.

FINAL COURSE: GROUP – I

PAPER – 2: ADVANCED FINANCIAL MANAGEMENT

Time Allowed – 3 Hours **Maximum Marks – 100**

1. *The question paper comprises two parts, Part I and Part II.*
2. *Part I comprises Case Scenario based Multiple Choice Questions (MCQs)*
3. *Part II comprises questions which require descriptive type answers.*

PART I – Case Scenario based MCQs (30 Marks)

Part I is compulsory.

Case Scenario I

Mr. Y has invested in the three mutual funds (MF) as per the following details:

Particulars	MF 'X'	MF 'Y'	MF 'Z'
Amount of Investment (₹)	4,00,000	8,00,000	4,00,000
Net Assets Value (NAV) at the time of purchase (₹)	10.30	10.10	10
Dividend Received up to 31.03.2023 (₹)	9,000	0	6,000
NAV as on 31.03.2023 (₹)	10.35	10	10.30
Effective Yield per annum as on 31.03.2023 (percent)	9.66	-11.66	24.15

Assume 1 Year = 365 days

On the basis of above information, choose the most appropriate answer to the following questions:

1. Total NAV of MF 'Y' as on 31.03.2023 would be approximately ……
   (a) ₹ 401941.73
   (b) ₹ 412000.00
   (c) ₹ 792079.20
   (d) ₹ 82500.00
2. Total Yield of MF 'X' in terms of ₹ would be approximately ……..
   (a) ₹ 10941.73
   (b) ₹ 7,920.80
   (c) ₹ 18,000.00
   (d) ₹ 12450.45
3. Number of days for which MF 'X' is held would be approximately……
   (a) 31 Days
   (b) 68 Days

(c) 103 Days

(d) 85 Days

4. Number of days for which MF 'Y' is held would be……

(a) 31 Days

(b) 68 Days

(c) 103 Days

(d) 85 Days **(4 x 2 = 8 Marks)**

Case Scenario II

ABC Ltd. is planning to expand its business and therefore raising fund by issuing a convertible bond of ₹ 10 crore. An investor "Mr. X" is interested to invest in the bond of ABC Ltd. Mr. X has following data related to the convertible bond.

The data given below relates to a convertible bond:

Face value	₹ 250
Coupon rate	12%
No. of shares per bond	20
Market price of share	₹ 12
Straight value of bond	₹ 235
Market price of convertible bond	₹ 265
Maturity	5 Years

You, being an expert of the matter, are required to answer his questions. Select the most appropriate alternative:

5. The percentage of downside risk of the bond is approximately……..

(a) 10.42%

(b) 6.38%

(c) 2.13%

(d) 12.77%

6. The conversion premium in percentage term of the bond is……..

(a) 12.77%

(b) 10.42%

(c) 2.18%

(d) 13.45%

7. The conversion parity price of the stock is……

(a) ₹ 11.75

(b) ₹ 12.00

(c) ₹ 13.25

(d) ₹ 12.50

8. If he wants a yield of 15% the maximum price he should be ready to pay for is…….

(a) 217.41

(b) 224.81

(c) 240.00

(d) 232.32 **(4 x 2 = 8 Marks)**

Case Scenario III

Suppose you are a financial consultant and following 3 clients have approached to you seeking advise on the investment to be made in securities. All these clients have different background and risk appetite as well as perception to the market.

- Client A wants to invest in Fixed income avenues and therefore he is looking at the credit rating of the securities as well as financial ratios such as interest coverage, earning power etc and the general prospect of the industry.
- Client B wants to earn a fixed income over a period of time by holding the security till its maturity.
- Client C wants to earn more by taking more risk. Therefore, he is more interested to invest in stocks. He believes that Price reflects all information found in the record of past prices and volumes.

On the basis of above information, choose the most appropriate answer to the MCQs.

9. The main factor to be considered in selecting fixed income avenue for client A shall be……..

(a) Yield to maturity

(b) Risk of Default

(c) Tax Shield

(d) Liquidity

10. The main factor that have to be evaluated in the selection of Bond for Client B shall be……..

(a) Yield to maturity

(b) Risk of Default

(c) Tax Shield

(d) Liquidity

11. If Weak form efficiency is prevailing in the market then which approach is best for selection of Equity Shares?

(a) Technical Analysis

(b) Fundamental Analysis

(c) Random selection Analysis

(d) None of the above. **(3 x 2 = 6 Marks)**

Case Scenario IV

AES Ltd. wants to acquire DNF Ltd. and has offered a swap ratio of 1:2 (0.5 shares for every one share of DNF Ltd.). Following information is provided:

	AES Ltd.	DNF Ltd.
Profit after tax	₹ 36,00,000	₹ 7,20,000
Equity shares outstanding (Nos.)	12,00,000	3,60,000
PE Ratio	10 times	7 times
Market price per share	₹ 30	₹ 14

On the basis of above information, choose the most appropriate answer to the following questions:

12. The number of equity shares to be issued by AES Ltd. for acquisition of DNF Ltd. would be……

    (a) 1,68,000

    (b) 1,80,000

    (c) 2,40,000

    (d) 3,00,000

13. The EPS of AES Ltd. after the acquisition would be……

    (a) ₹ 2

    (b) ₹ 3

    (c) ₹ 3.13

    (d) ₹ 4.00

14. The equivalent earnings per share of DNF Ltd. would be……..

    (a) ₹ 1

    (b) ₹ 1.50

    (c) ₹ 1.57

    (d) ₹ 2.00

15. If AES Ltd. PE multiple remains unchanged then its expected market price per share after the acquisition would be……

    (a) ₹ 14

    (b) ₹ 30

    (c) ₹ 31.30

    (d) ₹ 40.00 **(4 x 2 = 8 Marks)**

PART – II DESCRIPTIVE QUESTIONS

Question No.1 is compulsory. Candidates are required to answer any four questions from the remaining five questions.

Working notes should form part of the answers.

Maximum Marks – 70 Marks

1. (a) XYZ Ltd. an Indian firm needs to pay JAPANESE YEN (JY) 1 crore on 30th June. In order to hedge the risk involved in foreign currency transaction, the firm is considering two alternative methods i.e. forward market cover and currency option contract.

On 1st April, following quotations (JY/INR) are made available:

Spot	3 months forward
1.7825/1.8245.	1.8726./1.8923

The prices for forex currency option on purchase are as follows:

Strike Price	JY 1.8855
Call option (June)	JY 0.047
Put option (June)	JY 0.098

For excess or balance of JY covered, the firm would use forward rate as future spot rate.

You are required to recommend cheaper hedging alternative for XYZ LTD.

Note: Except rates round off other calculations to nearest rupees. **(6 marks)**

(b) The expected returns and Beta of three stocks are given below

Stock	A	B	C
Expected Return (%)	20	13	17
Beta Factor	1.9	0.8	1.4

If the risk-free rate is 9% and the expected rate of return on the market portfolio is 14%, examine which of the above stocks are over, under or correctly valued in the market? What shall be the strategy? **(4 Marks)**

(c) What do you mean by the term Unicorn? State the features a Start-up should possess to be referred as a Unicorn? **(4 Marks)**

2. (a) DK Ltd. is considering an investment proposal in Sri Lanka involving an initial investment of LKR 25 billion. The current spot exchange rate is INR/LKR 0.370. The risk free rate in India is 6% and the same in Sri Lanka is 5.02%.

The project will generate a cash flow of LKR 5 billion in the first year. The cash flow will increase by LKR 1 billion each year for the next 4 years. The project will wind up on completion of 5 years with no salvage value. The required rate of return for the project is 8%

(i) You are required to find out the investment worth of the project by using

(1) Home Currency Approach

(2) Foreign Currency Approach

(ii) Compare the outcome under both the approaches.

Given:

PVIF (8%, t)	0.92593	0.85734	0.79383	0.73503	0.68058
PVIF (7%, t)	0.93457	0.87344	0.81630	0.76290	0.71299

Note: Excepts rates show all calculations in Billion upto four decimal points. **(6 Marks)**

(b) On the basis of the following information:

Current dividend (Do) = ₹ 5

Discount rate (k) = 10.5%

Growth rate (g) = 4%

(i) Calculate the present value of stock of ABC Ltd.

(ii) Evaluate whether the stock is overvalued if stock price is ₹ 70, ROE = 18% and EPS (E_0) = ₹ 4.50 applying:

(1) PE Multiple Approach and

(2) Earning Growth Model (using discount rate of 10.5%). **(4 Marks)**

(c) Explain the concept of Sustainable Growth Rate and also state assumptions of Sustainable growth model. **(4 Marks)**

3. (a) Mr. X is interested in investing ₹ 4,00,000 for which he is considering following three alternatives:

(i) Invest ₹ 4,00,000 in Security A

(ii) Invest ₹ 4,00,000 in Security B

(iii) Invest ₹ 2,40,000 in Security A and ₹ 1,60,000 in Security B

Average annual return earned on Security A and Security B is 15% and 14% respectively. Risk free rate of return is 10% and Market Rate of Return is 12%.

Covariance of returns of Security A , Security B and Market portfolio are as follows:

	Security A	Security B	Market
Security A	4.800	4.300	3.370
Security B	4.300	4.250	2.800
Market	3.370	2.800	3.100

On the basis of above information evaluate the following:

(i) Expected Return of Security A, B and Portfolio.

(ii) Variance of return of Security A, Security B and Market.

(iii) Variance and Standard Deviation of Portfolio.

(iv) Systematic and Unsystematic Risks of Security A, Security B and Portfolio.

(10 Marks)

(b) Either

Tokenization to some extent resembles the process of Securitization. Explain the term "Tokenization " and also illustrate the similarities between Tokenization and Securitization.

(4 Marks)

(b) Or

While in securitization the securities issued by SPV are backed by the loans and receivables the CDOs are backed by pool of bonds, asset backed securities, REITs, and other CDOs. Describe the main types of risk associated with investment in CDOs. **(4 Marks)**

4. (a) ABC Ltd. has ₹ 600 million, 12 per cent bonds outstanding with six years remaining to maturity. Since interest rates are falling, ABC Ltd. is contemplating of refunding these bonds with a ₹ 600 million issue of 6 year bonds carrying a coupon rate of 10 per cent. Issue cost of the new bond will be ₹ 12 million and the call premium is 4 per cent. ₹ 18 million being the unamortized portion of issue cost of old bonds can be written off no sooner the old bonds are called off. Marginal tax rate of ABC Ltd. is 30 per cent. Examine the bond refunding decision.

[PVIFA (7%, 6 years) = 4.766]

Note: Carry out calculations in ₹ Million and round off calculations upto 4 decimal points.

(6 Marks)

(b) Mr. A established the following strategy on the stock of D Ltd. which is currently trading at ₹ 1000 per share:

(1) Purchased one 3-month call option with a premium of ₹ 60 at an exercise price of ₹ 1100 per share.

(2) Purchased one 3-month put option with a premium of ₹ 10 at an exercise price of ₹ 900 per share.

Appraise the position of Mr. A if after 3-months the price of D Ltd. stock:

(i) remains at ₹ 1000.

(ii) falls at ₹ 700.

(iii) rises to ₹ 1300.

Assume the option size is 100 shares of D Ltd. **(4 Marks)**

(c) List out the areas where the concept of Value at Risk (VAR) can be applied? **(4 Marks)**

5. (a) Following information is given in respect of Alpha Ltd., which is expected to grow at a rate of 20% p.a. for the next three years, after which the growth rate will stabilize at 8% p.a. normal level, in perpetuity.

	For the year ended March 31, 2023
Revenues	₹ 15,000 Crores
Cost of Goods Sold (COGS)	₹ 6,000 Crores
Operating Expenses	₹ 4,500 Crores
Capital Expenditure	₹ 1,500 Crores
Depreciation (included in Operating Expenses)	₹ 1,200 Crores

During high growth period, Revenues & Earnings before Interest & Tax (EBIT) will grow at 20% p.a. and capital expenditure net of depreciation will grow at 15% p.a.

From year 4 onwards, i.e. normal growth period revenues and EBIT will grow at 8% p.a. and incremental capital expenditure will be offset by the depreciation. During both high growth & normal growth period, net working capital requirement will be 25% of revenues.

Out of total capital, 60% constitute Equity and rest is Debt. The cost of equity is 17.53% and pre-tax cost of debt is 16%.

Corporate Income Tax rate is 30%.

Required:

Estimate the value of Alpha Ltd. using Free Cash Flows to the Firm (FCFF).

The PVIF @ 15 % for the three years are as below:

Year	t_1	t_2	t_3
PVIF	0.8696	0.7561	0.6575

Note: Carry out calculation in ₹ Crore and round off figures upto two decimal points.

(8 Marks)

(b) A trader is having in its portfolio shares worth ₹ 170 lakhs at current price and cash ₹ 30 lakhs. The beta of share portfolio is 1.6.

Evaluate:

(i) Current portfolio beta

(ii) Portfolio beta after 3 months if the trader on current date goes for long position on ₹ 200 lakhs Nifty futures and after 3 months the price of shares dropped by 3.2%.

(6 Marks)

6. (a) Suppose a dealer quotes 'All-in-cost' for a generic swap at 8% against six-month MIBOR flat. If the notional principal amount of swap is ₹10,00,000.

(i) Calculate semi-annual fixed payment.

(ii) Produce the first floating rate payment for (i) above if the six month period from the effective date of swap to the settlement date comprises 181 days and that the corresponding MIBOR was 6% on the effective date of swap.

In (ii) above, if the settlement is on 'Net' basis, how much the fixed rate payer would pay to the floating rate payer?

Generic swap is based on 30/360 days basis. **(6 Marks)**

(b) The Textile Manufacturing Company Ltd. is considering one of two mutually exclusive proposals, Projects M and N, which require cash outlays of ₹ 17,00,000 and ₹ 16,50,000 respectively. The certainty-equivalent (C.E) approach is used in incorporating risk in capital budgeting decisions. The current yield on Treasury bond is 6%. The expected net cash flows and their respective certainty equivalents are as follows:

Project M			Project N	
Year-end	**Cash Flow ₹**	**C.E.**	**Cash Flow ₹**	**C.E.**
1	9,00,000	0.8	9,00,000	0.9
2	10,00,000	0.7	9,00,000	0.8
3	10,00,000	0.5	10,00,000	0.7

Present value factors of ₹ 1 discounted at 6% at the end of year 1, 2 and 3 are 0.943, 0.890 and 0.840 respectively.

Required:

(i) Recommend which project should be accepted?

(ii) Suppose if risk adjusted discount rate method is to be used for evaluation then which project would be appraised with a higher discount rate and why? **(8 Marks)**

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FINAL COURSE: GROUP – I

PAPER – 2: ADVANCED FINANCIAL MANAGEMENT

ANSWER TO PART – I CASE SCENARIO BASED MCQS

1 **Option (c)**

2. **Option (a)**

3 **Option (c)**

4. **Option (a)**

5. **Option (d)**

6. **Option (b)**

7. **Option (c)**

8. **Option (b)**

9. **Option (b)**

10. **Option (a)**

11. **Option (b)**

12. **Option (b)**

13. **Option (c)**

14. **Option (c)**

15. **Option (c)**

ANSWERS OF PART – II DESCRIPTIVE QUESTIONS

1. (a) (i) Forward Cover

3-month Forward Rate = $\frac{1}{1.8726}$ = ₹ 0.5340/JY

Accordingly, INR required for JY 1,00,00,000 (1,00,00,000 X ₹ 0.5340) = ₹ 53,40,000

(ii) Option Cover

To purchase JY 1,00,00,000, XYZ LTD shall enter into a Put Option @ JY 1.8855/INR

	₹
Accordingly, outflow in INR $\left(\frac{\text{JY}\,1,00,00,000}{1.8855}\right)$	53,03,633
Premium $\left(\frac{\text{INR}\,5303633 \times 0.098}{1.7825}\right)$	2,91,588
	55,95,221

Since outflow of cash is least in case of Forward Cover, same should be opted for.

(b) Required Rate of Return is given by

$$R_j = R_f + \beta (R_m - R_f)$$

For Stock A, $R_j = 9\% + 1.9 (14\% - 9\%) = 18.50\%$

Stock B, $R_j = 9\% + 0.8 (14\% - 9\%) = 13.00\%$

Stock C, $R_j = 9\% + 1.4 (14\% - 9\%) = 16.00\%$

Required Return %	Expected Return %	Valuation	Decision
18.50%	20.00%	Under Valued	Buy
13.00%	13.00%	Correctly Valued	Hold
16.00%	17.00%	Under Valued	Buy

(c) A Unicorn is a privately held start-up company which has achieved a valuation US$ 1 billion. This term was coined by venture capitalist Aileen Lee, first time in 2013. Unicorn, a mythical animal represents the statistical rarity of successful ventures.

A start-up is referred as a Unicorn if it has following features:

(i) A privately held start-up.

(ii) Valuation of start-up reaches US$ 1 Billion.

(iii) Emphasis is on the rarity of success of such start-up.

(iv) Other common features are new ideas, disruptive innovation, consumer focus, high on technology etc.

However, it is important to note that in case the valuation of any start-up slips below US$ 1 billion it can lose its status of 'Unicorn'. Hence a start-up may be Unicorn at one point of time and may not be at another point of time.

2. (a) Working Notes:

Calculation of Forward Exchange Rates

End of Year	₹	₹/LKR
1	$0.37 \times \frac{1.06}{1.052}$	0.373
2	$0.373 \times \frac{1.06}{1.052}$	0.376
3	$0.376 \times \frac{1.06}{1.052}$	0.379
4	$0.379 \times \frac{1.06}{1.052}$	0.382
5.	$0.382 \times \frac{1.06}{1.052}$	0.385

1. Home Currency Approach

Year	Cash Flow Billion LKR	₹ / LKR	Cash flow Billion ₹	PVF @ 8%	PV Billion ₹
1	5	0.373	1.865	0.92593	1.7269
2	6	0.376	2.256	0.85734	1.9342
3	7	0.379	2.653	0.79383	2.1060
4	8	0.382	3.056	0.73503	2.2463
5	9	0.385	3.465	0.68058	2.3582
					10.3716
Less: Investment	25	0.37			9.2500
				NPV	1.1216

2. Foreign Currency Approach

(1 + 0.06) (1+ Risk Premium) = 1.08

1 + Risk Premium = 1.08/1.06 = 1.01887

Therefore, Risk adjusted LKR Rate = 1.01887 × 1.0502 – 1 = 0.07 i.e. 7%

Calculation of NPV

Year	Cash Flow (Billion LKR)	PVF @ 7%	PV (Billion LKR)
1	5	0.93457	4.6729
2	6	0.87344	5.2406
3	7	0.81630	5.7141
4	8	0.76290	6.1032
5	9	0.71299	6.4169
			28.1477
Less: Investment			25.0000
		NPV	3.1477

Thus, Rupee NPV of the Project = ₹ 0.37 × 3.1477 = ₹ 1.1646 billion

Decision: NPV is positive in the approach so, project will worth investment.

(b) (i) Present Value of the stock of ABC Ltd. is:-

$$Vo = \frac{5(1.04)}{0.105-0.04} = ₹\ 80/-.$$

(ii) (A) Value of stock under the PE Multiple Approach

Particulars	
Actual Stock Price	₹ 70.00
Return on equity	18%
EPS	₹ 4.50
PE Multiple (1/Return on Equity) = 1/18%	5.56
Market Price per Share	₹ 25.02

Since, Actual Stock Price is higher, hence it is overvalued.

(B) Value of the Stock under the Earnings Growth Model

Particulars	
Actual Stock Price	₹ 70.00
Return on equity	18%
EPS	₹ 4.50
Growth Rate	4%
Market Price per Share [EPS ×(1+g)]/(K_e – g) = ₹ 4.50x 1.04 / (0.105-0.04)	₹ 72

Since, Actual Stock Price is lower, hence it is slightly undervalued.

(c) The sustainable growth rate (SGR), concept by Robert C. Higgins, of a firm is the maximum rate of growth in sales that can be achieved, given the firm's profitability, asset utilization, and desired dividend payout and debt (financial leverage) ratios. The sustainable growth rate is a measure of how much a firm can grow without borrowing more money. After the firm has passed this rate, it must borrow funds from another source to facilitate growth. Variables typically include the net profit margin on new and existing revenues; the asset turnover ratio, which is the ratio of sales revenues to total assets; the assets to equity ratio; and the retention rate, which is defined as the fraction of earnings retained in the business.

SGR = ROE x (1- Dividend payment ratio)

Sustainable growth model assume that the business wants to:

1) maintain a target capital structure without issuing new equity;
2) maintain a target dividend payment ratio; and
3) increase sales as rapidly as market conditions allow.

3. (a) Working Notes:

(1) Beta of each Security

$$\beta = \frac{Cov(\text{Security}, Market)}{Varianceof\ Market}$$

$$\beta_A = \frac{3.370}{3.100} = 1.087$$

$$\beta_B = \frac{2.800}{3.100} = 0.903$$

(2) Weight of Security A in portfolio = $\frac{2,40,000}{4,00,000} = 0.60$

Weight of Security B in portfolio = $\frac{1,60,000}{4,00,000}$ = 0.40

(3) Portfolio Beta

0.60 x 1.087 + 0.40 x 0.903 = 1.013

(i) Expected Return

Security A Return = 10% + 1.087(12% - 10%) = 12.17%.

Security B Return = 10% + 0.903(12% - 10%) = 11.81%.

Portfolio Return = 10% + 1.013(12% - 10%) = 12.03%.

(ii) Variance of Returns

$$Cor_{i,j} = \frac{Cov(i,j)}{\sigma_i \sigma_j}$$

Accordingly, for Security A

$$1 = \frac{Cov(A,A)}{\sigma_A \sigma_A}$$

σ_A^2= 4.800

Accordingly, for Security B

$$1 = \frac{Cov(B,B)}{\sigma_B \sigma_B}$$

σ_B^2= 4.250

Accordingly, for Market Return

$$1 = \frac{Cov(M,M)}{\sigma_M \sigma_M}$$

σ_M^2 = 3.100

Alternatively, by referring diagonally the given Table these values can identified as follows:

$Variance_A$ = 4.800

$Variance_B$ = 4.250

$Variance_M$ = 3.100

(iii) Variance and Standard Deviation of Portfolio Variance

$\sigma_{AB}^2 = w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + 2w_A w_B Cov_{A,B}$

= $(0.60)^2(4.800) + (0.40)^2(4.250) + 2(0.60)(0.40)(4.300)$

Variance = 4.472

Standard Deviation

$\sigma_{AB} = \sqrt{4.472}$ = 2.115

(iv) Systematic and Unsystematic Risks of Security A, Security B and Portfolio

Systematic Risk = $\beta^2\sigma_m^2$

Accordingly,

Systematic Risk of Security A = $(1.087)^2$ x 3.10 = 3.663

Systematic Risk of Security B = $(0.903)^2$ x 3.10 = 2.528

Systematic Risk of Portfolio = $(1.013)^2$ x 3.10 = 3.181

Unsystematic Risk = Total Risk – Systematic Risk

Accordingly,

Unsystematic Risk of Security A = 4.80 – 3.663 = 1.137

Unsystematic Risk of Security B = 4.250 – 2.528 = 1.722

Unsystematic Risk of Portfolio = 4.472 – 3.181 = 1.291

(b) Tokenization is a process of converting tangible and intangible assets into blockchain tokens. Digitally representing anything has recently acquired a lot of traction. It can be effective in conventional industries like real estate, artwork etc.

Tokenization and Securitization

Since tokenization of illiquid assets attempts to convert illiquid assets into a product that is liquid and tradable and hence to some extent it resembles the process of Securitization. Hence, following are some similarities between Tokenization and Securitization:

(i) Liquidity: - First and foremost both Securitization and Tokenization inject liquidity in the market for the assets which are otherwise illiquid assets.

(ii) Diversification: - Both help investors to diversify their portfolio thus managing risk and optimizing returns.

(iii) Trading: - Both are tradable hence helps to generate wealth.

(iv) New Opportunities: - Both provide opportunities for financial institutions and related agencies to earn income through collection of fees.

OR

The main types of risk associated with investment in CDOs are as follows:

(i) Default Risk: - Also called 'credit risk', it emanates from the default of underlying party to the instruments. The prime sufferers of these types of risks are equity or junior tranche in the waterfall.

(ii) Interest Rate Risk: - Also called Basis risk and mainly arises due to different basis of interest rates. For example, asset may be based on floating interest rate but the liability may be based on fixed interest rates. Though this type of risk is quite difficult to manage fully but commonly used techniques such as swaps, caps, floors, collars etc. can be used to mitigate the interest rate risk.

(iii) Liquidity Risk: - Another major type of risk by which CDOs are affected is liquidity risks as there may be mismatch in coupon receipts and payments.

(iv) Prepayment Risk: - This risk results from unscheduled or unexpected repayment of principal amount underlying the security. Generally, this risk arises in case assets are subject to fixed rate of interest and the debtors have a call option. Since, in case of falling interest rates they may pay back the money.

(v) Reinvestment Risk: - This risk is generic in nature as the CDO manager may not find adequate opportunity to reinvest the proceeds when allowed for substitutions.

(vi) Foreign Exchange Risk: - Sometimes CDOs are comprised of debts and loans from countries other than the country of issue. In such a case, in addition to above mentioned risks, CDOs are also subject to the foreign exchange rate risk.

4. (a) (i) Calculation of initial outlay:-

		₹ (million)
a.	Face value	600
	Add:-Call premium	24
	Cost of calling old bonds	624
b.	Gross proceed of new issue	600
	Less: Issue costs	12
	Net proceeds of new issue	588
c.	Tax savings on call premium and unamortized cost 0.30 (24+18)	12.60

∴ Initial outlay = ₹ 624 million – ₹ 588 million – ₹ 12.60 million = ₹ 23.40 million

(ii) Calculation of net present value of refunding the bond:-

Saving in annual interest expenses	₹ (million)
[600 x (0.12 – 0.10)]	12.00
Less:- Tax saving on interest and amortization	
0.30 x [12 + (18-12)/6]	3.90
Annual net cash saving	8.10
PVIFA (7%, 6 years)	4.766
∴ Present value of net annual cash saving	₹ 38.6046 million
Less:- Initial outlay	₹ 23.40 million
Net present value of refunding the bond	₹ 15.2046 million

Decision: The bonds should be refunded

(b) Total premium paid on purchasing a Call and Put option

= (₹ 60 per share × 100) + (₹ 10 per share × 100).

= ₹ 6,000 + ₹ 1000 = ₹ 7,000

(i) In this case, Mr. A exercises neither the Call option nor the Put option as both will result in a loss for him.

Accordingly, the Ending value = - ₹ 7,000 + zero gain = - ₹ 7,000

i.e Net loss = ₹ 7000

(ii) Since the price of the stock is below the exercise price of the Call, the Call will not be exercised. Only Put is valuable and hence is exercised. Accordingly,

Total Premium paid = ₹ 7,000

Ending value = – ₹ 7000 + ₹ [(900 – 700) × 100] = – ₹ 7000 + ₹ 20,000 = ₹ 13,000

∴ Net gain = ₹ 13,000

(iii) Since the price of stock rises above the exercise price of Put, the Put will not be exercised. Only Call is valuable and hence is exercised. Accordingly,

Total Premium paid = ₹ 7,000

Ending value = – ₹ 7000 + ₹ [(1300-1100) × 100]

= - ₹ 7000 + ₹ 20000

Net gain = ₹ 13,000

(c) VAR can be applied in the following areas:

(a) to measure the maximum possible loss on any portfolio or a trading position.

(b) as a benchmark for performance measurement of any operation or trading.

(c) to fix limits for individuals dealing in front office of a treasury department.

(d) to enable the management to decide the trading strategies.

(e) as a tool for Asset and Liability Management especially in banks.

5. (a) Determination of forecasted Free Cash Flow to the Firm (FCFF)

(₹ in crores)

	Yr. 1	Yr. 2	Yr. 3	Terminal Year
Revenue	18000.00	21600.00	25920.00	27993.60
COGS	7200.00	8640.00	10368.00	11197.44
Operating Expenses	3960.00*	4752.00	5702.40	6158.59
Depreciation	1440	1728	2073.60	2239.49
EBIT	5400	6480	7776	8398.08
Tax @30%	1620	1944	2332.80	2519.42
EAT	3780	4536	5443.20	5878.66
Capital Exp. – Dep.	345	396.76	456.26	-
∆ Working Capital	750	900	1080	518.40
Free Cash Flow (FCF)	2685	3239.24	3906.94	5360.26

* Excluding Depreciation.

Calculation of WACC

= 60% x 17.53% + 40% x 16% (1-0.30)

= 15%

Present Value (PV) of FCFF during the explicit forecast period is:

FCFF (₹ in crores)	PVF @ 15%	PV (₹ in crores)
2685.00	0.8696	2334.88
3239.24	0.7561	2449.19
3906.94	0.6575	2568.81
		7352.88

PV of the terminal, value is:

$$\frac{5360.26}{0.15 - 0.08} \times \frac{1}{(1.15)^3} = ₹\ 76575.14 \text{ Crore} \times 0.6575 = ₹\ 50348.16 \text{ Crore}$$

The value of the firm is :

₹ 7352.88 Crores + ₹ 50348.16 Crores = ₹ 57701.04 Crores

(b) **(i) Current Portfolio Beta**

Current Beta for share portfolio = 1.6

Beta for cash = 0

Current portfolio beta = 170/200 x 1.6 + 0 x 30/200 = 1.36

(ii) Portfolio beta after 3 months:

$$\text{Beta for portfolio of shares} = \frac{\text{Change in value of portfolio of share}}{\text{Change in value of market portfolio (Index)}}$$

$$1.6 = \frac{0.032}{\text{Change in value of market portfolio (Index)}}$$

Change in value of market portfolio (Index) = (0.032 / 1.6) x 100 = 2%

Position taken on 100 lakh Nifty futures : Long

Value of index after 3 months = ₹ 200 lakh x (1.00 - 0.02)

= ₹ 196 lakh

Mark-to-market paid = ₹ 4 lakh

Cash balance after payment of mark-to-market = ₹ 26 lakh.

Value of portfolio after 3 months = ₹170 lakh x (1 - 0.032) + ₹26 lakh

= ₹190.56 lakh

Change in value of portfolio = $\frac{200\text{lakh} - 190.56\text{lakh}}{200\text{ lakh}} = 4.72\%$

Portfolio beta = 0.0472/0.02 = 2.36

6. (a) (i) Semi-annual fixed payment

= (N) (AIC) (Period)

Where N = Notional Principal amount = ₹ 10,00,000

AIC = All-in-cost = 8% = 0.08

$$= 10,00,000 \times 0.08 \left(\frac{180}{360}\right)$$

$$= 10,00,000 \times 0.08\ (0.50)$$

$$= 10,00,000 \times 0.04 = ₹\ 40,000/-$$

(ii) Floating Rate Payment

$= N (MIBOR) \left(\frac{dt}{360}\right)$

$= 10,00,000 \times 0.06 \times \frac{181}{360}$

= 10,00,000 × 0.06 (0.503) or 10,00,000 × 0.06 (0.502777)

= 10,00,000 × 0.03018 or 10,00,000 × 0.030167 = ₹ 30,180 or 30,167

(iii) Net Amount

= (i) – (ii)

= ₹ 40,000 – ₹ 30,180 = ₹ 9820

or = ₹ 40,000 – ₹ 30,167 = ₹ 9,833

(b) (i) Statement Showing the Net Present Value of Project M

Year end	*Cash Flow (₹) (a)*	*C.E. (b)*	*Adjusted Cash flow (₹) (c) = (a) × (b)*	*Present value factor at 6% (d)*	*Total Present value (₹) (e) = (c) × (d)*
1	9,00,000	0.8	7,20,000	0.943	6,78,960
2	10,00,000	0.7	7,00,000	0.890	6,23,000
3	10,00,000	0.5	5,00,000	0.840	4,20,000
					17,21,960
Less: Initial Investment					17,00,000
Net Present Value					21,960

Statement Showing the Net Present Value of Project N

Year end	*Cash Flow (₹) (a)*	*C.E. (b)*	*Adjusted Cash flow (₹) (c) = (a) × (b)*	*Present value factor (d)*	*Total Present value (₹) (e) = (c) × (d)*
1	9,00,000	0.9	8,10,000	0.943	7,63,830
2	9,00,000	0.8	7,20,000	0.890	6,40,800
3	10,00,000	0.7	7,00,000	0.840	5,88,000
					19,92,630
Less: Initial Investment					16,50,000
Net Present Value					3,42,630

Decision: Since the net present value of Project N is higher, so the project N should be accepted.

(ii) Since Certainty - Equivalent (C.E.) Co-efficient of Project M (2.0) is lower than Project N (2.4), Project M is riskier than Project N and as "higher the riskiness of a cash flow, the lower will be the CE factor". Thus if risk adjusted discount rate (RADR) method is used, Project M would be analysed with a higher rate.