Mock Test Paper - Series I: March, 2024

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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.