FINAL COURSE: GROUP – I

PAPER – 2: ADVANCED FINANCIAL MANAGEMENT

ANSWER TO PART – I CASE SCENARIO BASED MCQS

1.   **Option (d)**

2.   **Option (b)**

3   **Option (b)**

4.   **Option (b)**

5.   **Option (c)**

6.   **Option (b)**

7.   **Option (c)**

8.   **Option (c)**

9.   **Option (b)**

10. **Option (a)**

11. **Option (d)**

12. **Option (a)**

13. **Option (b)**

14. **Option (c)**

15. **Option (c)**

ANSWERS OF PART – II DESCRIPTIVE QUESTIONS

1.   (a)   (i)   **Method I**

Stock's return

Small cap growth = 4.5 + 0.80 x 6.85 + 1.39 x (-3.5) + 1.35 x 0.65 = 5.9925%

Small cap value = 4.5 + 0.90 x 6.85 + 0.75 x (-3.5) + 1.25 x 0.65 = 8.8525%

Large cap growth = 4.5 + 1.165 x 6.85 + 2.75 x (-3.5) + 8.65 x 0.65 = 8.478%

Large cap value = 4.5 + 0.85 x 6.85 + 2.05 x (-3.5) + 6.75 x 0.65 = 7.535%

Expected return on market index

0.25 x 5.9925 + 0.10 x 8.8525 + 0.50 x 8.478 + 0.15 x 7.535 = 7.7526%

Method II

Expected return on the market index

= 4.5% + [0.1x0.9 + 0.25x0.8 + 0.15x0.85 + 0.50x1.165] x 6.85 + [(0.75 x 0.10 + 1.39 x 0.25 + 2.05 x 0.15 + 2.75 x 0.5)] x (-3.5) + [{1.25 x 0.10 + 1.35 x 0.25 + 6.75 x 0.15 + 8.65 x 0.50)] x 0.65

= 4.5 + 6.85 + (-7.3675) + 3.77 = 7.7525%.

(ii) Using CAPM,

Small cap growth   = 4.5 + 6.85 x 0.80 = 9.98%

Small cap value   = 4.5 + 6.85 x 0.90 = 10.665%

Large cap growth   = 4.5 + 6.85 x 1.165 = 12.48%

Large cap value   = 4.5 + 6.85 x 0.85 = 10.3225%

Expected return on market index

= 0.25 x 9.98 + 0.10 x 10.665 + 0.50 x 12.45 + 0.15 x 10.3225 = 11.33%

(iii) Let us assume that Mr. NK will invest X_1% in Small cap value stock and X_2% in Large cap growth stock

$X_1 + X_2 = 1$

$0.90 X_1 + 1.165 X_2 = 1$

$0.90 X_1 + 1.165(1 - X_1) = 1$

$0.90 X_1 + 1.165 - 1.165 X_1 = 1$

$0.165 = 0.265 X_1$

$\dfrac{0.165}{0.265} = X_1$

$0.623 = X_1$ and $X_2 = 0.377$

62.30% in Small cap value stocks

37.70% in Large cap growth stocks.   **(6 marks)**

(b) **(i)** NAV of the Fund

$$= \frac{₹\,1,97,000 + ₹\,2,41,30,000 + ₹\,26,44,000 + ₹\,6,74,90,000 + ₹\,7,77,000}{800000}$$

$$= \frac{₹\,9,52,38,000}{800000} = ₹\,119.0475 \text{ rounded to } ₹\,119.05$$

(b) The revised position of fund shall be as follows:

Shares	No. of shares	Price	Amount (₹)
A Ltd.	10000	19.70	1,97,000
B Ltd.	50000	482.60	2,41,30,000
C Ltd.	28000	264.40	74,03,200
D Ltd.	100000	674.90	674,90,000
E Ltd.	30000	25.90	7,77,000
Cash			2,40,800
			10,02,38,000

No. of units of fund $= 800000 + \dfrac{5000000}{119.0475} = 842000$ **(4 marks)**

(c) VAR is a measure of risk of investment. This investment can be a portfolio, capital investment or foreign exchange etc., VAR answers two basic questions -

(i) What is worst case scenario?

(ii) What will be loss?

Following are main features of VAR

(i) Components of Calculations: VAR calculation is based on following three components:

    (a) Time Period

    (b) Confidence Level – Generally 95% and 99%

    (c) Loss in percentage or in amount

(ii) Statistical Method: It is a type of statistical tool based on Standard Deviation.

(iii) Time Horizon: VAR can be applied for different time horizons say one day, one week, one month and so on.

(iv) Probability: Assuming the values are normally attributed, probability of maximum loss can be predicted. **(4 marks)**

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2. **(a)** **Calculation of Variance and Standard Deviation**

Project K

Expected Net Cash Flow

$$= (0.10 \times 11) + (0.20 \times 13) + (0.40 \times 15) + (0.20 \times 17) + (0.10 \times 19)$$

$$= 1.1 + 2.6 + 6 + 3.4 + 1.9 = 15$$

$$\sigma^2 = 0.10(11-15)^2 + 0.20(13-15)^2 + 0.40(15-15)^2 + 0.20(17-15)^2 + 0.10(19-15)^2$$

$$= 1.6 + 0.8 + 0 + 0.8 + 1.6 = 4.8$$

$$\sigma = \sqrt{4.8} = 2.19$$

Project S

Expected Net Cash Flow

$$= (0.10 \times 9) + (0.25 \times 13) + (0.30 \times 17) + (0.25 \times 21) + (0.10 \times 25)$$

$$= 0.9 + 3.25 + 5.1 + 5.25 + 2.5 = 17$$

$$\sigma^2 = 0.1(9-17)^2 + 0.25(13-17)^2 + 0.30(17-17)^2 + 0.25(21-17)^2 + 0.10(25-17)^2$$

$$= 6.4 + 4 + 0 + 4 + 6.4 = 20.8$$

$$\sigma = \sqrt{20.8} = 4.56$$

Calculation of Coefficient of Variation

$$\text{Coefficient of Variation} = \frac{\text{Standard Deviation}}{\text{Mean}}$$

$$\text{Project K} = \frac{2.19}{15} = 0.146$$

$$\text{Project S} = \frac{4.56}{17} = 0.268$$

Project S is riskier as it has higher Coefficient of Variation. **(6 marks)**

(b) **(i)** Let P be the buyback price decided by R Ltd.

Market Capitalisation after Buyback

1.1P (Original Shares – Shares Bought Back)

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$$= 1.1P \left(10 \text{ lakhs} - \frac{27\% \text{ of } 100 \text{ lakhs}}{P} \right)$$

= 11 lakhs × P – 27 lakhs × 1.1 = 11 lakhs P – 29.7 lakhs

Again, 11 lakhs P – 29.7 lakhs

or 11 lakhs P = 210 lakhs + 29.7 lakhs

or P = $\frac{239.7}{11}$ = ₹ 21.79 per share

(ii) Number of Shares to be Bought Back :-

$\frac{₹\ 27 \text{ lakhs}}{₹\ 21.79}$ = 1.24 lakhs (Approx.) or 123910 share

(iii) New Equity Shares:-

10 lakhs – 1.24 lakhs = 8.76 lakhs or 1000000 – 123910 = 876090 shares

$$\therefore \text{EPS} = \frac{3 \times 10 \text{ lakhs}}{8.76 \text{ lakhs}} = ₹\ 3.43$$

Thus, EPS of R Ltd., increases to ₹ 3.43.   **(4 marks)**

(c) The techniques used for analyzing the industry wide factors are:

(a) *Regression Analysis:* Investor diagnoses the factors determining the demand for output of the industry through product demand analysis. Factors to be considered are GNP, disposable income, per capita consumption / income, price elasticity of demand. For identifying factors affecting demand, statistical techniques like regression analysis and correlation are used.

(b) *Input – Output Analysis:* It reflects the flow of goods and services through the economy, intermediate steps in production process as goods proceed from raw material stage through final consumption. This is carried out to detect changing patterns/trends indicating growth/decline of industries.

                    (4 marks)

3. **(a)** **(i)** Receipt under three proposals

   (I)   Proposal of Mr. Peter

   Invoicing in £ will produce = $\frac{€\ 2.8 \text{ million}}{1.1965}$ = £ 2.340 million

(II)   Proposal of Mr. Wilson

Forward Rate = € 1.1970-0.0055 = 1.1915

Using Forward Market hedge Sterling receipt would be:

$\dfrac{€2.8\,\text{million}}{1.1915}$ = £ 2.35 million

(III)   Proposal of Ms. Karen

The equivalent sterling of the order placed based on future price (€1.1943)

= $\dfrac{€2.8\,\text{million}}{1.1943}$ = £ 2,344,470 (rounded off)

Number of Contracts = $\dfrac{£2,344,470}{62,500}$ = 37 Contracts (to the nearest whole number)

Thus, € amount hedged by future contract will be = 37 × £ 62,500 = £ 23,12,500

Buy Future at	€ 1.1943
Sell Future at	€ <u>1.1873</u>
	€ <u>0.0070</u>

Total loss on Future Contracts = 37 × £ 62,500 × € 0.0070 = € 16,188

After 6 months

Amount Received	€ 28,00,000
Less: Loss on Future Contracts	€ <u>16,188</u>
	€ <u>27,83,812</u>

Sterling Receipts

On sale of € at spot = $\dfrac{€27,83,812}{1.1873}$ = £ 2.3446 million

Proposal of option (b) is preferable because the option (a) & (c) produces least receipts.

(ii) Further, Mr. Wilson must be doubtful about Mr. Wilson's proposal as firm is entering in a competitive market and invoicing in seller's currency may not be acceptable to the buyers. **(6 marks)**

(b) Nominal Interest or Bond Equivalent Yield = $\left[\dfrac{F-P}{P}\right] \times \dfrac{12}{M} \times 100$

Where

F= Face Value

P= Issue Price

$= \dfrac{1,00,000 - 97,550}{97,550} \times \dfrac{12}{3} \times 100$ = 0.025115 × 4 × 100 = 10.046 = 10.05% p.a.

Effective interest rate = $[1+\dfrac{0.1005}{4}]^4 - 1$ = 10.435% p.a.

Cost of Funds to the Company

Effective Interest	10.435%
Brokerage (0.150 × 4)	0.60%
Rating Charge	0.50%
Stamp duty (0.175 × 4)	0.70%
	12.235%

Alternatively, effective interest rate can also be computed as follows:

Let i be the interest rate then

$97,750 = \dfrac{100000}{1+i \times \dfrac{3}{12}}$

i = 10.046

Cost of Funds to the Company

Effective Interest	10.046%
Brokerage (0.150 × 4)	0.60%
Rating Charge	0.50%
Stamp duty (0.175 × 4)	0.70%
	11.846%

(4 marks)

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(c) Following are the steps involved in securitization mechanism:

1. **Creation of Pool of Assets:** The process of securitization begins with creation of pool of assets by segregation of assets backed by similar type of mortgages.

2. **Transfer to SPV:** Once assets have been pooled, they are transferred to Special Purpose Vehicle (SPV) especially created for this purpose.

3. **Sale of Securitized Papers:** SPV designs the instruments based on nature of interest, risk, tenure, pool of assets etc.

4. **Administration of assets:** The administration of assets in sub-contracted back to originator which collects principal and interest from underlying assets and transfer it to SPV, which works as a servicer/ conduit typically for an agreed fee.

5. **Recourse to Originator:** Performance of securitized papers depends on the performance of underlying assets and unless specified otherwise in case of default by debtors, receivables go back to originator from SPV.

6. **Repayment of funds:** SPV will repay the funds to the investor in form of interest and principal that arises from the assets pooled.

7. **Credit Rating to Instruments:** Sometime before the sale of securitized instruments credit rating can be done to assess the risk of the issuer.

(4 marks)

OR

The factors affecting Value of an Option are mentioned below:

(a) **Price Movement of the Underlying:** The value of calls and puts are affected by changes in the underlying stock price in a relatively straightforward manner.

(b) **Time till expiry:** The option's future expiry, at which time it may become worthless, is an important and key factor of every option strategy.

(c) **Volatility in Stock Prices:** SV is a statistical measure of the past price movements of the stock; it tells you how volatile the stock has actually been over a given period of time.

(d) **Interest Rate-** Another feature which affects the value of an Option is the time value of money. The greater the interest rates, the present value of the future exercise price are less. **(4 marks)**

4. (a) (i) The difference in yield curve may due to the lower credit rating of ABC Ltd. compared to XYZ Ltd.

(ii) DEF Bank will fix interest rate for 2V3 FRA after 2 years as follows:

<u>XYZ Ltd.</u>

$$(1+r)(1+0.0420)^2 = (1+0.0448)^3$$
$$(1+r)(1.0420)^2 = (1.0448)^3$$
$$r = 5.04\%$$

Bank will quote 5.04% for a 2V3 FRA.

<u>ABC Ltd.</u>

$$(1+r)(1+0.0548)^2 = (1+0.0578)^3$$
$$(1+r)(1.0548)^2 = (1.0578)^3$$
$$r = 6.38\%$$

Bank will quote 6.38% for a 2V3 FRA.

(iii) Interest payable by XYZ Ltd. under two scenarios will be computed as follows:

		4.50% - Option is allowed to be lapsed	5.50% - Option is Exercised
Interest	₹ 100 crores X 4.50%	₹ 4.50 crores	-
	₹ 100 crores X 5.04%*	-	₹ 5.04 crores
Premium (Cost of Option)	₹ 100 crores X 0.10%	₹ 0.10 crores	₹ 0.10 crores
		4.60 crores	5.14 crores

* Since after 2 years 1 year interest rate turned out to be 5.50%, it will be beneficial for XYZ Ltd. to exercise its option. **(4 marks)**

(b) (i) Equity Beta

To calculate Equity Beta first we shall calculate Weighted Average of Asset Beta as follows:

= 1.45 x 0.74 + 1.20 x 0.26

= 1.073 + 0.312 = 1.385

Now we shall compute Equity Beta using the following formula:

$$\beta_{Asset} = \beta_{Equity}\left[\frac{E}{E + D(1-t)}\right] + \beta_{Debt}\left[\frac{D(1-t)}{E + D(1-t)}\right]$$

Accordingly,

$$1.385 = \beta_{Equity}\left[\frac{410}{410 + 170}\right] + \beta_{Debt}\left[\frac{170}{410 + 170}\right]$$

$$1.385 = \beta_{Equity}\left[\frac{410}{580}\right] + 0.24\left[\frac{170}{580}\right]$$

$$\beta_{Equity} = 1.86$$

(ii)   Equity Beta on change in Capital Structure

Amount of Debt to be raised:

Particulars	Value
Total Value of Firm (Equity ₹ 410 cr + Debt ₹ 170 cr)	₹580 Cr
Desired Debt Equity Ratio	1.90 : 1.00
Desired Debt Level = $\dfrac{Total\,Value\,x\;Debt\,Ratio}{Debt\,Ratio + Equity\,Ratio}$	₹ 380 Cr
Less: Value of Existing Debt	(₹ 170 Cr)
Value of Debt to be Raised	₹ 210 Cr

Equity after Repurchase   = Total value of Firm – Desired Debt Value

= ₹ 580 Cr – ₹ 380 Cr

= ₹ 200 Cr

Weighted Average Beta of KGFL:

Source of Finance	Investment (₹ Cr)	Weight	Beta	Weighted Beta
Equity	200	0.345	$\beta_{(E = X)}$	0.345x
Debt – 1	170	0.293	0.35	0.103
Debt – 2	210	0.362	0.40	0.145
	580	Weighted Average Beta		0.248 + (0.345x)

$\beta_{KGFL} = 0.248 + 0.345x$

$1.385 = 0.248 + 0.345x$

$0.345x = 1.385 - 0.248$

$X = 1.137/0.345 = 3.296$

$\beta_{KGFL} = 3.296$ **(6 marks)**

(c) Three main types of fund structure exist which are as follows:

(i) *Domestic Funds:* Domestic Funds (i.e. one which raises funds domestically) are usually structured as:

1) a domestic vehicle for the pooling of funds from the investor, and

2) a separate investment adviser that carries those duties of asset manager.

The choice of entity for the pooling vehicle falls between a trust and a company, with the trust form prevailing due to its operational flexibility.

(ii) *Offshore Funds:* Two common alternatives available to offshore investors are: the "offshore structure" and the "unified structure".

Offshore structure:

Under this structure, an investment vehicle makes investments directly into Indian portfolio companies. The assets are managed by an offshore manager, while the investment advisor in India carries out the due diligence and identifies deals.

Unified Structure:

When domestic investors are expected to participate in the fund, a unified structure is used. Overseas investors pool their assets in an offshore vehicle that invests in a locally managed trust, whereas domestic investors directly contribute to the trust. **(4 marks)**

5. (a) (i) (1) To compute the beta of 10th security first we shall compute overall weighted beta as follows:

Let weighted β of the Portfolio is w, then,

$$5 = \frac{994450}{8767.07 \times 25} \times w$$

w = 1.102 approximately

Let beta of 10th security is β then,

1.102 = 0.90 x 1.10 + 0.10 x β

β = 1.12

(2) The main reason for the profit in cash position might be due to reason that contrary to her expectation fall in the value of cash position there may be increase in value of cash position or decrease in the stock price may be lesser than 2%.

(ii) (1) Future Price = Spot + Cost of Carry – Dividend

= ₹ 125 + (₹ 125 x 0.08) – ₹ 4 = ₹ 131

Price of one future contract = 1000 share x ₹ 131 = ₹ 1,31,000

(2) Price decrease by 6%

Market Price = ₹ 125 x 94% = ₹ 117.50

Then, price of one future contract

= ₹ 117.50 + (₹ 117.50 x 0.08) – ₹ 4 = ₹ 122.90

= ₹ 122.90 x 1000 = ₹ 1,22,900

(3) If the investor has taken a long position, decrease in price will result in **_loss_** for the investor.

Amount of loss will be:

₹ 1,31,000 - ₹ 1,22,900 = ₹ 8,100 **(8 Marks)**

(b) (i) By entering into an FRA, firm shall effectively lock in interest rate for a specified future in the given it is 6 months. Since, the period of 6 months is starting in 3 months, the firm shall opt for 3 × 9 FRA locking borrowing rate at 5.94%. In the given scenarios, the net outcome shall be as follows:

	If the rate turns out to be 4.50%	If the rate turns out to be 6.50%
FRA Rate	5.94%	5.94%
Actual Interest Rate	4.50%	6.50%
Loss/ (Gain)	1.44%	(0.56%)
FRA Payment / (Receipts)	€50 m × 1.44% × ½ = €360,000	€50m × 0.56% × ½ = (€140,000)

Interest after 6 months on €50 Million at actual rates	= €50m × 4.5% × ½ = €1,125,000	= € 50m × 6.5% × ½ = €1,625,000
Net Out Flow	€ 1,485,000	€1,485,000

Thus, by entering into FRA, the firm has committed itself to a rate of 5.94% as follows: $\dfrac{€\,1,485,000}{€\,50,000,000} \times 100 \times \dfrac{12}{6}$ = 5.94%

(ii) Since firm is a borrower it will like to off-set interest cost by profit on Future Contract. Accordingly, if interest rate rises it will gain hence it should sell interest rate futures.

No. of Contracts $= \dfrac{\text{Amount of Borrowing}}{\text{Contract Size}} \times \dfrac{\text{Duration of Loan}}{3\ \text{months}}$

$= \dfrac{€\,50,000,000}{€\,50,000} \times \dfrac{6}{3}$ = 2000 Contracts

The final outcome in the given two scenarios shall be as follows:

	If the interest rate turns out to be 4.5%	If the interest rate turns out to be 6.5%
Futures Course Action:		
Sell to open	94.15	94.15
Buy to close	95.50 (100 - 4.5)	93.50 (100 - 6.5)
Loss/ (Gain)	1.35%	(0.65%)
Cash Payment (Receipt) for Future Settlement	€50,000×2000× 1.35%×3/12 = €337,500	€50,000×2000×0.65% ×3/12 = (€162,500)
Interest for 6 months on €50 million at actual rates	€50 million × 4.5% × ½ = €11,25,000	€50 million × 6.5% × ½ = €16,25,000
	€1,462,500	€1,462,500

Thus, the firm locked itself in interest rate $\dfrac{€\,1,462,500}{€\,50,000,000} \times 100 \times \dfrac{12}{6}$ = 5.85%

(6 Marks)

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6. **(a)** Financial Analysis whether to set up the manufacturing units in India or not may be carried using NPV technique as follows:

I. Incremental Cash Outflows

	$ Million
Cost of Plant and Machinery	500.00
Working Capital	50.00
Release of existing Working Capital	(15.00)
	535.00

II. Incremental Cash Inflow after Tax (CFAT)

   (a) Generated by investment in India for 5 years

	$ Million
Sales Revenue (5 Million x $80)	400.00
Less: Costs	
Variable Cost (5 Million x $20)	100.00
Fixed Cost	30.00
Depreciation ($500Million/5)	100.00
EBIT	170.00
Taxes@35%	59.50
EAT	110.50
Add: Depreciation	100.00
CFAT (1-5 years)	210.50

   (b) Cash flow at the end of the 5 years (Release of Working Capital) 35.00

   (c) Cash generation by exports (Opportunity Cost)

	$ Million
Sales Revenue (1.5 Million x $80)	120.00
Less: Variable Cost (1.5 Million x $40)	60.00
Contribution before tax	60.00
Tax@35%	21.00
CFAT (1-5 years)	39.00

(d)   Additional CFAT attributable to Foreign Investment

	$ Million
Through setting up subsidiary in India	210.50
Through Exports in India	39.00
CFAT (1-5 years)	171.50

III.   Determination of NPV

Year	CFAT ($ Million)	PVF@12%	PV ($ Million)
1-5	171.50	3.6048	618.2232
5	35	0.5674	19.8590
			638.0822
Less: Initial Outflow			535.0000
			103.0822

Since NPV is positive the proposal should be accepted.   **(8 Marks)**

(b)   Working Notes:

(i)   The Earnings of S Ltd.

	₹ lakh
Earnings of C Ltd.	10000
Earnings of D Ltd.	5800
	15800
Growth	0.08
Earnings of S Ltd. (15800 X 1.08)	17064

(ii)   Market Value of S Ltd.

	₹ lakh
Earnings of S Ltd.	17064
P/E Ratio (10+9)/2	9
Market Value of S Ltd.	153576

(iii)   No. of shares in S Ltd.

No. of shares of C Ltd.	4000
No. of shares issued to P Ltd.	3000
No. of shares of C Ltd.	7000

Gain to Shareholders of P Ltd.

Share of Shareholders of P Ltd. in S Ltd. (3000/7000) x 153576	₹ 65818.29 lakh
Market Value of P Ltd. before merger (5800 X 10)	₹ 58000.00 lakh
Gains to Shareholders	₹ 7818.29 lakh
No. of Shares (before merger)	1000 lakh
Gain Per Share	₹ 7.82

(6 Marks)