FINAL COURSE: GROUP – I

PAPER – 2: ADVANCED FINANCIAL MANAGEMENT

ANSWER TO PART – I CASE SCENARIO BASED MCQS

1. **Option (a)**

2. **Option (b)**

3. **Option (c)**

4. **Option (c)**

5. **Option (a)**

6. **Option (d)**

7. **Option (c)**

8. **Option (c)**

9. **Option (b)**

10. **Option (a)**

11. **Option (a)**

12. **Option (b)**

13. **Option (b)**

14. **Option (b)**

15. **Option (a)**

ANSWERS OF PART – II : DESCRIPTIVE QUESTIONS

1. **(a)** **(i)** Portfolio Beta

   0.20 x 0.40 + 0.50 x 0.50 + 0.30 x 1.10 = 0.66

   (ii) Residual Variance

   To determine Residual Variance first of all we shall compute the Systematic Risk as follows:

$\beta_A^2 \times \sigma_M^2 = (0.40)^2(0.01) = 0.0016$

$\beta_B^2 \times \sigma_M^2 = (0.50)^2(0.01) = 0.0025$

$\beta_C^2 \times \sigma_M^2 = (1.10)^2(0.01) = 0.0121$

Residual Variance

A   0.015 – 0.0016 = 0.0134

B   0.025 – 0.0025 = 0.0225

C   0.100 – 0.0121 = 0.0879

(iii)   Portfolio variance using Sharpe Index Model

Systematic Variance of Portfolio = $(0.10)^2 \times (0.66)^2 = 0.004356$

Unsystematic Variance of Portfolio = $0.0134 \times (0.20)^2 + 0.0225 \times (0.50)^2 + 0.0879 \times (0.30)^2 = 0.014072$

Total Variance = 0.004356 + 0.014072 = 0.018428

(iv)   Portfolio variance on the basis of Markowitz Theory

$= (w_A \times w_A \times \sigma_A^2) + (w_A \times w_B \times Cov_{AB}) + (w_A \times w_C \times Cov_{AC}) + (w_B \times w_A \times Cov_{AB}) + (w_B \times w_B \times \sigma_B^2) + (w_B \times w_C \times Cov_{BC}) + (w_C \times w_A \times Cov_{CA}) + (w_C \times w_B \times Cov_{CB}) + (w_C \times w_C \times \sigma_C^2)$

$= (0.20 \times 0.20 \times 0.015) + (0.20 \times 0.50 \times 0.030) + (0.20 \times 0.30 \times 0.020) + (0.20 \times 0.50 \times 0.030) + (0.50 \times 0.50 \times 0.025) + (0.50 \times 0.30 \times 0.040) + (0.30 \times 0.20 \times 0.020) + (0.30 \times 0.50 \times 0.040) + (0.30 \times 0.30 \times 0.10)$

= 0.0006 + 0.0030 + 0.0012 + 0.0030 + 0.00625 + 0.0060 + 0.0012 + 0.0060 + 0.0090

= 0.0363

(b)   The standard deviation of the daily change in the investment in each asset is ₹ 2,00,000 i.e. 2 lakhs. The variance of the portfolio's daily change is

$$V = 2^2 + 2^2 + 2 \times 0.3 \times 2 \times 2 = 10.4$$

$$\sigma \text{ (Standard Deviation)} = \sqrt{10.4} = ₹ 3.22 \text{ lakhs}$$

Alternatively, it can also be computed as follows:

$= (1)^2(0.50)^2 + (1)^2(0.50)^2 + 2(1)(1)(0.3)(0.50)(0.50)$

$= 0.25 + 0.25 + 0.15 = 0.65\%$

$\sigma \text{ (Standard Deviation)} = \sqrt{0.65} = 0.80623\%$

σ (Standard Deviation) in Amount = ₹ 400 lakhs x 0.80623% = ₹ 3.22 lakhs

Accordingly, the standard deviation of the 10-day change is

$$₹ 3.22 \text{ lakhs} \times \sqrt{10} = ₹ 10.18 \text{ lakh}$$

From the Normal Table we see that z score for 1% is 2.33. This means that 1% of a normal distribution lies more than 2.33 standard deviations below the mean. The 10-day 99 percent value at risk is therefore

$$2.33 \times ₹10.18 \text{ lakh} = ₹ 23.72 \text{ lakh}$$

(c) Pricing of securitized instruments is an important aspect of securitization. While pricing the instruments, it is important that it should be acceptable to both originators as well as to the investors. On the same basis pricing of securities can be divided into following two categories:

(i) From Originator's Angle

From originator's point of view, the instruments can be priced at a rate at which originator has to incur an outflow and if that outflow can be amortized over a period of time by investing the amount raised through securitization.

(ii) From Investor's Angle

From an investor's angle security price can be determined by discounting best estimate of expected future cash flows using rate of yield to maturity of a security of comparable security with respect to credit quality and average life of the securities.

2. (a) Calculation of NPV

NPV = - 20,00,00,000 + 4,00,000 x 300 x PVF (12%, 1) + 6,00,000 x 300 x PVF (12%, 2) + 6,00,000 x 300 x PVF (12%, 3)

= - 20,00,00,000 + 10,71,60,000 + 14,34,60,000 + 12,81,60,000

= 37,87,80,000 – 20,00,00,000

= ₹ 17,87,80,000

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Measurement of sensitivity is as follows:

(i) Sales Price

Let the sale price/Unit be S so that the project would break even with 0 NPV.

$\therefore 20,00,00,000 = 4,00,000 \times (S – 500) \times PVF (12\%, 1) + 6,00,000 \times (S – 500) \times PVF (12\%, 2) + 6,00,000 \times (S – 500) \times PVF (12\%, 3)$

S – 500 = 20,00,00,000/12,62,600

S – 500 = ₹ 158.40

S = ₹ 658.40 which represents a fall of (800-658.40)/800

Or 0.177 or 17.70%

(ii) Unit Cost

Let the Cost/Unit be C so that the project would break even with 0 NPV with sales price = ₹ 800.

$\therefore 20,00,00,000 = 4,00,000 \times (800 – C) \times PVF (12\%, 1) + 6,00,000 \times (800 – C) \times PVF (12\%, 2) + 6,00,000 \times (800 – C) \times PVF (12\%, 3)$

800 – C = 20,00,00,000/12,62,600

800 – C = ₹ 158.40

C = ₹ 641.60 which represents an increase of (641.60 - 500)/500 Or 0.2832or 28.32%

Or

If sale price = ₹ 800.00 the cost price required to give a margin of ₹ 158.40 i.e., (₹ 800 – ₹ 158.40) or ₹ 641.60 which would represent a rise of 28.32% i.e., $\dfrac{641.60 - 500}{500} \times 100$

(iii) Sales volume

The requisite percentage fall is: -

17,87,80,000/37,87,80,000 $\times$ 100 = 47.20%

(iv) Since PV of inflows remains at ₹ 37,87,80,000 the initial outlay must also be the same.

$\therefore$ Percentage rise = 17,87,80,000/20,00,00,000 $\times$ 100 = 89.39%.

(b) **(i)** Equilibrium price of Equity using CAPM

= 9% + 1.20(13% - 9%)

= 9% + 4.80%= 13.80%

$$P = \frac{D_1}{k_e \text{-} g} = \frac{2.00(1.07)}{0.138 \text{-} 0.07} = \frac{2.14}{0.068} = ₹\,31.47$$

(ii) New Equilibrium price of Equity using CAPM

= 11% + 1.3(15% - 11%)

= 11% + 5.2%= 16.20%

$$P = \frac{D_1}{k_e \text{-} g} = \frac{2.00(1.10)}{0.162 - 0.10} = ₹\,35.48$$

(c) The cost-of-carry model for Futures Contract Pricing, is as under: -

Future price = Spot price + Carrying cost – Returns (dividends, etc.)

This is also called as Theoretical minimum price or arbitrage free price.

The difference between the prevailing spot price of an asset and the futures price is known as the Basis, i.e.,

Basis = Spot price – Futures price

In a normal market, the spot price is less than the futures price (which includes the full cost-of-carry) and accordingly the basis would be negative. Such a market, in which the basis is decided solely by the cost-of-carry is known as a contango market.

Basis can become positive, i.e., the spot price can exceed the futures price only if there are factors other than the cost of carry to influence the futures price. In case this happens, then basis becomes positive and the market under such circumstances is termed as a backwardation market or inverted market.

3. **(a)** **(i)** NAV of the Fund.

$$= \frac{3,94,000 + 4,82,60,000 + 52,88,000 + 13,50,34,000 + 15,00,000}{8,00,000}$$

$$= \frac{19,04,76,000}{8,00,000} = ₹ 238.095 \text{ rounded to } ₹ 238.10$$

(ii) **(A)** No. of units to be issued to Mr. X $= \dfrac{50,00,100}{238.10} = 21000$

(B) No. of shares of E Ltd. to be purchased:

Fund received from Mr. X	₹ 50,00,100
Less: - Position of cash to be maintained	(₹ 4,76,000)
Amount of cash available for acquisition of shares of E. Ltd.	₹ 45,24,100
Price per share of E Ltd.	₹ 25.00
Number of shares to be acquired (45,24,100/25)	1,80,964

(iii) On 2nd April 2023, the NAV of fund will be as follows:

Shares	No. of shares	Price	Amount (₹)
A Ltd.	20000	20.30	4,06,000
B Ltd.	100000	513.70	5,13,70,000
C Ltd.	20000	290.80	58,16,000
D Ltd.	200000	671.90	13,43,80,000
E Ltd.	240964	44.00	1,06,02,416
Cash			4,76,000
			20,30,50,416

NAV as on 2nd April 2023 $= \dfrac{20,30,50,416}{8,21,000} = ₹ 247.32$ per unit

(b) The levered beta of the company will be 1.8[1+(1-0.3)*40/60)] = 2.64

The adjusted EBITDA would be ₹ 90 crore – ₹ 10 crore – ₹ 20 crore = ₹ 60 crore

The EV will be multiple of 5 on the 60 obtained above = ₹ 300 crore

The Cost of equity in accordance with CAPM = Rf + β (Rm – Rf)

= 5% + 2.64 (11% - 5%) = 20.84%

The WACC = Cost of Equity + Cost of Debt

= 20.84 (60/100) + 8.40 (40/100) = 15.864

Finally, the future cash flows can be discounted at the WACC obtained above as under –

	Y1	Y2	Y3
Future Cash flows (₹ crore)	100	120	150
Discount factor (₹ crore)	0.863	0.745	0.643
PVs of cash flows (₹ crore)	86.30	89.40	96.45
Value of Firm (₹ crore)			**272.15**

(c)   **Either**

The Dow Theory's purpose is to determine where the market is and where is it going, although not how far or high. The theory, in practice, states that if the cyclical swings of the stock market averages are successively higher and the successive lows are higher, then the market trend is up and a bullish market exists. Contrarily, if the successive highs and successive lows are lower, then the direction of the market is down and a bearish market exists.

The Dow Theory is based upon the movements of two indices, constructed by Charles Dow, Dow Jones Industrial Average (DJIA) and Dow Jones Transportation Average (DJTA).

The movements of the market are divided into three classifications, all going at the same time:-

(i)   the primary movement,

(ii)   the secondary movement, and

(iii)   the daily fluctuations.

The primary movement is the main trend of the market, which lasts from one year to 36 months or longer. This trend is commonly called bear or bull market.

The secondary movement of the market is shorter in duration than the primary movement and is opposite in direction. It lasts from two weeks to a month or more.

The daily fluctuations are the narrow movements from day-to-day.

<p align="center">**OR**</p>

Markowitz has formalized the risk return relationship and developed the concept of efficient frontier using the Mean-Variance Dominance Principle. For selection

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of a portfolio, comparison between combinations of portfolios is essential. As a rule, a portfolio is dominating another portfolio in terms of mean and variance if there is another portfolio with:

(a) A lower expected value of return and same or higher standard deviation (risk).

(b) The same or higher standard deviation (risk) but a lower expected return.

Markowitz has defined the diversification as the process of combining assets that are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing any portfolio returns. If an investors' portfolio is not efficient he may:

(i) Increase the expected value of return without increasing the risk.

(ii) Decrease the risk without decreasing the expected value of return, or

(iii) Obtain some combination of increase of expected return and decrease risk.

4.   **(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.

(b)

Shares	No. of shares (lakhs) (1)	Market Price of Per Share (2)	× (2) (₹ lakhs)	% to total (w)	ß (x)	wx
A Ltd.	3.00	500.00	1500.00	0.30	1.40	0.42
B Ltd.	4.00	750.00	3000.00	0.60	1.20	0.72

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C Ltd.	2.00	250.00	<u>500.00</u> <u>5000.00</u>	<u>0.10</u> 1.00	1.60	<u>0.16</u> <u>1.30</u>

(1) Portfolio beta   1.30

(2) Required Beta   0.91

Let the proportion of risk free securities for target beta 0.91 = p

0.91 = 0 × p + 1.30 (1 – p)

p = 0.30 i.e. 30%

Shares to be disposed off to reduce beta (5000 × 30%) ₹ 1,500 lakh and Risk Free securities to be acquired.

(3) Number of shares of each company to be disposed off

Shares	% to total (w)	Proportionate Amount (₹ lakhs)	Market Price Per Share	No. of Shares (Lakh)
A Ltd.	0.30	450.00	500.00	0.90
B Ltd.	0.60	900.00	750.00	1.20
C Ltd.	0.10	150.00	250.00	0.60

(4) Number of Nifty Contract to be sold

$$\frac{(1.30\text{-}0.91) \times 5000 \text{ lakh}}{8{,}125 \times 200} = 120 \text{ contracts}$$

(5) 2% rises in Nifty is accompanied by 2% x 1.30 i.e. 2.6% rise for portfolio of shares

	₹ Lakh
Current Value of Portfolio of Shares	5000
Value of Portfolio after rise	5130
Mark-to-Market Margin paid (8125 × 0.020 × ₹ 200 × 120)	39
Value of the portfolio after rise of Nifty	5091
% change in value of portfolio (5091 – 5000)/ 5000	1.82%
% rise in the value of Nifty	2%
Beta	0.91

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5. **(a)** Market price per share (MPS) = EPS X P/E ratio or P/E ratio = MPS/EPS

(i) Determination of EPS, P/E ratio, ROE and BVPS of BA Ltd. and DA Ltd.

		BA Ltd.	DA Ltd.
Earnings After Tax	(EAT)	₹ 2,10,000	₹ 99,000
No. of Shares	(N)	100000	80000
EPS	(EAT/N)	₹ 2.10	₹ 1.2375
Market price per share	(MPS)	40	15
P/E Ratio	(MPS/EPS)	19.05	12.12
Equity Funds	(EF)	₹ 12,00,000	₹ 8,00,000
BVPS	(EF/N)	12	10
ROE	(EAT/EF) × 100	17.50%	12.37%

(ii) Estimation of growth rates in EPS for BA Ltd. and DA Ltd.

Retention Ratio	(1-D/P ratio)	0.6	0.4
Growth Rate	(ROE × Retention Ratio)	10.50%	4.95%

(iii) Justifiable equity shares exchange ratio

(a) Intrinsic value based   = ₹ 20 / ₹ 40   = 0.5:1 (upper limit)

(b) Market price = MPS_{DA}/MPS_{BA} = ₹ 15 / ₹ 40   = 0.375:1 (lower limit) based

Since, BA Ltd. has a higher EPS, ROE, P/E ratio and even higher EPS growth expectations, the negotiable terms would be expected to be closer to the lower limit, based on the existing share prices.

(iv) Calculation of Post merger EPS and its effects

Particulars			BA Ltd.	DA Ltd.	Combined
EAT	(₹)	(i)	2,10,000	99,000	3,09,000
Share outstanding		(ii)	100000	80000	132000*
EPS	(₹)	(i) / (ii)	2.1	1.2375	2.341
EPS Accretion (Dilution)	(Re.)		0.241	(0.301***)	

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(v) Estimation of Post merger Market price and other effects

Particulars			BA Ltd.	DA Ltd.	Combined
EPS	(₹)	(i)	2.1	1.2375	2.341
P/E Ratio		(ii)	19.05	12.12	19.05
MPS	(₹)	(i) / (ii)	40	15	44.6
MPS Accretion	(₹)		4.6	2.84***	

* Shares outstanding (combined) = 100000 shares + (0.40 × 80000) = 132000 shares

** EPS claim per old share	= ₹ 2.34 × 0.4	₹ 0.936
EPS dilution	= ₹ 1.2375 – ₹ 0.936	₹ 0.3015
***S claim per old share	(₹ 44.60 × 0.4)	₹ 17.84
Less: MPS per old share		₹ <u>15.00</u>
		₹ <u>2.84</u>

(b) **(i)** TM will make a profit of 25 basis points since a 6X9 FRA is a contract on 3-month interest rate in 6 months, which turns out to be 5.50% (higher than FRA price).

(ii) The settlement amount shall be calculated by using the following formula:

$$\frac{N(RR-FR)(dtm/360)}{1+RR(dtm/360)}$$

Where

N = Notional Principal Amount

RR = Reference Rate

FR = Agreed upon Forward Rate

Dtm = FRA period specified in days.

Accordingly:

$$\frac{100\,crore(5.50\%-5.25\%)(90/360)}{1+0.055(90/360)} = ₹\,6,16,523$$

Hence there is profit of ₹ 6,16,523 to TM Fincorp.

6. **(a)**

Date	1 Sensex	2 EMA for Previous day	3 1-2	4 3×0.062	5 EMA 2 + 4
6	14522	15000	(478)	(29.636)	14970.364
7	14925	14970.364	(45.364)	(2.812)	14967.55
10	15222	14967.55	254.45	15.776	14983.32
11	16000	14983.32	1016.68	63.034	15046.354
12	16400	15046.354	1353.646	83.926	15130.28
13	17000	15130.28	1869.72	115.922	15246.202
17	18000	15246.202	2753.798	170.735	15416.937

Conclusion – The market is bullish. The market is likely to remain bullish for short term to medium term if other factors remain the same. On the basis of this indicator (EMA) the investors/brokers can take long position.

(b) **Option I (To finance the purchases by availing loan at 18% per annum):**

Cost of equipment	₹ in lakhs
3400 lakh yen at ₹100 = 340 yen	1,000.00
Add: Interest at 4.5% I Quarter	45.00
Add: Interest at 4.5% II Quarter (on ₹1045 lakhs)	47.03
Total outflow in Rupees	1,092.03
Alternatively, interest may also be calculated on compounded basis, i.e.,	
₹ 1000 × [1.045]²	₹1092.03

Option II (To accept the offer from foreign branch):

Cost of letter of credit	
At 1 % on 3400 lakhs yen at ₹100 = 340 yen	₹ 10.00 lakhs
Add: Interest for 2 Quarters	₹ 0.90 lakhs
(A)	₹ 10.90 lakhs
Payment at the end of 180 days:	
Cost	3400.00 lakhs yen

Interest at 2% p.a. [3400 × 2/100 × 180/365]	33.53 lakhs yen
	3433.53 lakhs yen
Conversion at ₹100 = 345 yen [3433.53 / 345 ×100] (B)	₹ 995.23 lakhs
Total Cost: (A) + (B)	₹ 1006.13 lakhs

Advise: Option 2 is cheaper by (1092.03 – 1006.13) lakh or ₹ 85.90 lakh. Hence, the offer may be accepted.

(c) Traditional lenders like banks etc. are not interested in a startup business. The reason is that when you are just starting out, you're not at the point yet where a conservative lender or investor can rely on security of your assets or be able to forecast cashflows to secure their investments or estimate your repayment capacity with certainty. So that leaves one with the option of selling some assets, borrowing against one's home, asking loved ones i.e. family and friends for loans etc. But that involves a lot of risk, including the risk of bankruptcy and strained relationships with friends and family.

Here are some of the sources for funding a startup:

(i)   Personal financing

(ii)   Personal credit lines

(iii)   Family and friends

(iv)   Peer-to-peer lending

(v)   Crowdfunding