## MODEL TEST PAPER 3

## 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 (b)**
6. **Option (a)**
7. **Option (d)**
8. **Option (b)**
9. **Option (b)**
10. **Option (a)**
11. **Option (a)**
12. **Option (d)**
13. **Option (b)**
14. **Option (c)**
15. **Option (b)**

## ANSWERS OF PART – II DESCRIPTIVE QUESTIONS

1. **(a)** **P.V. of Cash Flows**

| | | | |
|---|---|---|---|
| Year 1 | Running Cost | ₹ 4,000 x 0.917 | = (₹ 3,668) |
| | Savings | ₹ 12,000 x 0.917 | = ₹ 11,004 |
| Year 2 | Running Cost | ₹ 5,000 x 0.842 | = (₹ 4,210) |
| | Savings | ₹ 14,000 x 0.842 | = ₹ 11,788 |
| | | | ₹ 14,914 |

| | | | |
|---|---|---|---|
| Year 0 | Less: P.V. of Cash Outflow | ₹ 10,000 x 1 | ₹ 10,000 |
| | | **NPV** | ₹ 4,914 |

**Sensitivity Analysis**

(i) If the initial project cost is varied adversely by say 10%.

NPV (Revised) (₹ 4,914 – ₹ 1,000) = ₹ 3,914

Change in NPV $\frac{₹\ 4,914 - ₹\ 3,914}{₹\ 4,914}$ = 20.35%

(ii) If Annual Running Cost is varied by say 10%.

NPV (Revised) (₹ 4,914 – ₹ 400 X 0.917 – ₹ 500 X 0.843)

= ₹ 4,914 – ₹ 367 – ₹ 421= ₹ 4,126

Change in NPV $\frac{₹\ 4,914 - ₹\ 4,126}{₹\ 4,914}$ = 16.04%

(iii) If Saving is varied by say 10%.

NPV (Revised) (₹ 4,914 – ₹ 1,200 X 0.917 – ₹ 1,400 X 0.843)

= ₹ 4,914 – ₹ 1,100 – ₹ 1,180 = ₹ 2,634

Change in NPV $\frac{₹\ 4,914 - ₹\ 2,634}{₹\ 4,914}$ = 46.40%

Hence, savings factor is the most sensitive to affect the acceptability of the project. **(6 Marks)**

**(b) Net exposure of each foreign currency in Rupees**

| | Inflow **(Millions)** | Outflow **(Millions)** | Net Inflow **(Millions)** | Spread | Net Exposure **(Millions)** |
|---|---|---|---|---|---|
| US$ | 40 | 20 | 20 | 0.81 | 16.20 |
| FFr | 20 | 8 | 12 | 0.67 | 8.04 |
| UK£ | 30 | 20 | 10 | 0.41 | 4.10 |
| Japan Yen | 15 | 25 | -10 | -0.80 | 8.00 |

**(4 Marks)**

**(c) Stages of funding for VC**

- *Seed Money:* Low level financing needed to prove a new idea.
- *Start-up:* Early-stage firms that need funding for expenses associated with marketing and product development.
- *First-Round:* Early sales and manufacturing funds.
- *Second-Round:* Working capital for early stage companies that are selling product, but not yet turning in a profit.
- *Third Round:* Also called Mezzanine financing, this is expansion money for a newly profitable company.
- *Fourth-Round:* Also called bridge financing, it is intended to finance the "going public" process. **(4 Marks)**

**2. (a) (i) Profit at current exchange rates**

2400 [€ 500 × ₹ 51.50 – (S$ 800 × ₹ 27.25 + ₹ 1,000 + ₹ 1,500)]

2400 [₹ 25,750 - ₹ 24,300] = ₹ 34,80,000

Profit after change in exchange rates

2400[€500× ₹ 52 – (S$ 800 × ₹ 27.75 + ₹ 1000 + ₹ 1500)]

2400[₹ 26,000 - ₹ 24,700] = ₹ 31,20,000

Loss due to Transaction Exposure

₹ 34,80,000 – ₹ 31,20,000 = ₹ 3,60,000

**(ii)** Profit based on new exchange rates

2400[₹ 25,000 - (800 × ₹ 27.15 + ₹ 1,000 + ₹ 1,500)]

2400[₹ 25,000 - ₹ 24,220] = ₹ 18,72,000

Profit after change in exchange rates at the end of six months

2400 [₹ 25,000 - (800 × ₹ 27.75 + ₹ 1,000 + ₹ 1,500)]

2400 [₹ 25,000 - ₹ 24,700] = ₹ 7,20,000

Decline in profit due to transaction exposure

₹ 18,72,000 - ₹ 7,20,000 = ₹ 11,52,000

Current price of each unit in € = $\frac{₹\ 25,000}{₹\ 51.50} = €\ 485.44$

Price after change in Exch. Rate = $\frac{₹\ 25,000}{₹\ 51.75}$ = € 483.09

Change in Price due to change in Exch. Rate

€ 485.44 - € 483.09 = € 2.35 or (-) 0.48%

Price elasticity of demand = 1.5

Increase in demand due to fall in price 0.48 × 1.5 = 0.72%

Size of increased order = 2400 ×1.0072 = 2417 units

Profit = 2417 [₹ 25,000 – (800 × ₹ 27.75 + ₹ 1,000 + ₹ 1,500)]

= 2417 [₹ 25,000 - ₹ 24,700] = ₹ 7,25,100

Therefore, decrease in profit due to operating exposure

₹ 18,72,000 – ₹ 7,25,100 = ₹ 11,46,900

Alternatively, if it is assumed that Fixed Cost shall not be changed with change in units then answer will be as follows:

Fixed Cost = 2400[₹ 1,000] = ₹ 24,00,000

Profit = 2417 [₹ 25,000–(800× ₹ 27.75+₹ 1,500)] – ₹ 24,00,000

= 2417 (₹ 1,300) – ₹ 24,00,000 = ₹ 7,42,100

Therefore, decrease in profit due to operating exposure ₹ 18,72,000 – ₹ 7,42,100 = ₹ 11,29,900 **(10 Marks)**

**(b)** VAR can be applied:

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

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

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

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

(v) as a tool for Asset and Liability Management especially in banks. **(4 Marks)**

**3. (a) (i) Expected return of the portfolio A and B**

E (A) = (10 + 16) / 2 = 13%

E (B) = (12 + 18) / 2 = 15%

$$Rp = \sum_{i=1}^{N} X_i R_i = 0.4(13) + 0.6(15) = 14.2\%$$

**(ii)** Stock A:

Variance = 0.5 (10 – 13)² + 0.5 (16 – 13) ² = 9

Standard deviation = $\sqrt{9}$ = 3%

Stock B:

Variance = 0.5 (12 – 15) ² + 0.5 (18 – 15) ² = 9

Standard deviation = 3%

**(iii)** Covariance of stocks A and B

$Cov_{AB}$ = 0.5 (10 – 13) (12 – 15) + 0.5 (16 – 13) (18 – 15) = 9

**(iv)** Correlation of coefficient

$$r_{AB} = \frac{Cov_{AB}}{\sigma_A \sigma_B} = \frac{9}{3 \times 3} = 1$$

**(v)** Portfolio Risk

$$\sigma_P = \sqrt{X^2{}_A \sigma^2{}_A + X^2{}_B \sigma^2{}_B + 2X_A X_B (\sigma_A \sigma_B \sigma_{AB})}$$

$$= \sqrt{(0.4)^2(3)^2 + (0.6)^2(3)^2 + 2(0.4)(0.6)(3)(3)(1)}$$

$$= \sqrt{1.44 + 3.24 + 4.32} = 3\%$$ **(10 Marks)**

**(b)** Secondary participants involved into the securitization process are as follows:

*(i) Obligors:* They are the main root of the whole securitization process. They are the parties who owe money to the firm and are assets in the Balance Sheet of Originator. The amount due from the obligor is transferred to SPV and hence they form the basis of securitization process and their credit standing is of paramount importance in the whole process.

(ii) *Rating Agency:* Since the securitization is based on the pools of assets rather than the originators, the assets have to be assessed in terms of its credit quality and credit support available.

(iii) *Receiving and Paying agent (RPA):* Also, called Servicer or Administrator, it collects the payment due from obligor(s) and passes it to SPV. It also follows up with defaulting obligor and if required initiate appropriate legal action against them. Generally, an originator or its affiliates acts as servicer.

(iv) *Agent or Trustee:* Trustees are appointed to oversee that all parties to the deal perform in the true spirit of terms of agreement. Normally, it takes care of interest of investors who acquire the securities.

(v) *Credit Enhancer:* Since investors in securitized instruments are directly exposed to performance of the underlying securities and sometime may have limited or no recourse to the originator, they seek additional comfort in the form of credit enhancement. In other words, they require credit rating of issued securities which also empowers marketability of the securities.

*Originator* itself or a third party say a bank may provide this additional context called Credit Enhancer. While originator provides comfort in the form of over collateralization or cash collateral, the third party provides it in form of letter of credit or surety bonds.

(vi) *Structurer:* It brings together the originator, investors, credit enhancers and other parties to the deal of securitization. Normally, these are investment bankers also called arranger of the deal. It ensures that deal meets all legal, regulatory, accounting and tax laws requirements. **(4 Marks)**

**4. (a)** Cost of capital by applying Free Cash Flow to Firm (FCFF) Model is as follows:-

$$\text{Value of Firm} = V_0 = \frac{FCFF_1}{K_c - g_n}$$

Where –

$FCFF_1$ = Expected FCFF in the year 1

$K_c$= Cost of capital

$g_n$ = Growth rate forever

Thus, ₹ 1800 lakhs = ₹ 54 lakhs /($K_c$-g)

Since g = 9%, then $K_c$ = 12%

Now, let X be the weight of debt and given cost of equity = 20% and cost of debt = 10%, then 20% (1 – X) + 10% X = 12%

Hence, X = 0.80, so book value weight for debt was 80%

∴ Correct weight should be 60 of equity and 72 of debt.

∴ Cost of capital = $K_c$ = 20% (60/132) + 10% (72/132) = 14.5455% and correct firm's value

= ₹ 54 lakhs/ (0.1454 – 0.09) = ₹ 974.73 lakhs. **(6 Marks)**

**(b)** That price reflects all available information, the highest order of market efficiency. According to Eugene Fama, there exist three levels of market efficiency:-

*(i)* *Weak form efficiency* – Price reflects all information found in the record of past prices and volumes.

*(ii)* *Semi – Strong efficiency* – Price reflects not only all information found in the record of past prices and volumes but also all other publicly available information.

*(iii)* *Strong form efficiency* – Price reflects all available information public as well as private.

**(c)** In post-pandemic time their role has been advanced in the following areas in addition to traditional role:

*(i)* *Risk Management:* Now a days the CFOs are expected to look after the overall functioning of the framework of Risk Management system of an organisation.

*(ii)* *Supply Chain:* Post pandemic supply chain management system has been posing the challenge for the company to maintain the sustainable growth. Since CFOs are care takers of finance of the company, considering the financial viability

of the Supply Chain Management their role has now become more critical.

(iii) *Mergers, acquisitions, and Corporate Restructuring:* Since in recent period to maintain the growth and capture the market share there has been a spate of Mergers and Acquisitions and hence the role of CFOs has become more crucial because these are strategic decision and any error in them can lead to collapse of the whole business.

(iv) *Environmental, Social and Governance (ESG) Financing:* With the evolving of the concept of ESG their role has been shifted from traditional financing to sustainability financing.

Thus, from above discussion it can be concluded that in today's time CFOs are taking a leadership role in Value Creation for the organisation and that too on sustainable basis for a longer period.

**(4 Marks)**

**OR**

Stock index futures is most popular financial derivatives over stock futures due to following reasons:

1. It adds flexibility to one's investment portfolio. Institutional investors and other large equity holders prefer this instrument the most in terms of portfolio hedging purpose. The stock systems do not provide this flexibility and hedging.

2. It creates the possibility of speculative gains using leverage. Because a relatively small amount of margin money controls a large amount of capital represented in a stock index contract, a small change in the index level might produce a profitable return on one's investment if one is right about the direction of the market. Speculative gains in stock futures are limited but liabilities are greater.

3. Stock index futures are the most cost-efficient hedging device whereas hedging through individual stock futures is costlier.

4. Stock index futures cannot be easily manipulated whereas individual stock price can be exploited more easily.

5. Since, stock index futures consists of many securities, so being

an average stock, is much less volatile than individual stock price. Further, it implies much lower capital adequacy and margin requirements in comparison of individual stock futures. Risk diversification is possible under stock index future than in stock futures.

6. One can sell contracts as readily as one buys them and the amount of margin required is the same.

7. In case of individual stocks the outstanding positions are settled normally against physical delivery of shares. In case of stock index futures they are settled in cash all over the world on the premise that index value is safely accepted as the settlement price.

8. It is also seen that regulatory complexity is much less in the case of stock index futures in comparison to stock futures.

9. It provides hedging or insurance protection for a stock portfolio in a falling market. **(4 Marks)**

**5. (a) Working Notes:**

**(i) Computation of Forward Rates**

| End of Year | NC | NC/₹ |
|---|---|---|
| 1 | $NC1.60 \times \left(\frac{(1+0.09)}{(1+0.08)}\right)$ | 1.615 |
| 2 | $NC1.615 \times \left(\frac{(1+0.09)}{(1+0.08)}\right)$ | 1.630 |
| 3 | $NC1.630 \times \left(\frac{(1+0.09)}{(1+0.08)}\right)$ | 1.645 |

**(ii) NC Cash Flows converted in Indian Rupees**

| Year | NC (Million) | Conversion Rate | ₹ (Million) |
|---|---|---|---|
| 0 | -25.00 | 1.600 | -15.625 |

| | | | |
|---|---|---|---|
| 1 | 2.60 | 1.615 | 1.61 |
| 2 | 3.80 | 1.630 | 2.33 |
| 3 | 4.10 | 1.645 | 2.49 |

**Net Present Value**

(₹ Million)

| Year | Cash Flow in India | Cash Flow in Nepal | Total | PVF @ 9% | PV |
|---|---|---|---|---|---|
| 0 | --- | -15.625 | -15.625 | 1.000 | -15.625 |
| 1 | 2.869 | 1.61 | 4.479 | 0.917 | 4.107 |
| 2 | 4.200 | 2.33 | 6.53 | 0.842 | 5.498 |
| 3 | 4.600 | 2.49 | 7.09 | 0.772 | 5.473 |
| | | | | | **-0.547** |

**Modified Internal Rate of Return**

| | Year | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| Cash Flow (₹ Million) | -15.625 | 4.479 | 6.53 | 7.09 |
| Year 1 Cash Inflow reinvested for 2 years (1.188 x 4.479) | | | | 5.32 |
| Year 2 Cash Inflow reinvested for 1 years (1.090 x 6.53) | | | | 7.12 |
| | | | | 19.53 |

$$\text{MIRR} = \sqrt[n]{\frac{\text{Terminal Cash Flow}}{\text{Initial Outlay}}} - 1 = \sqrt[3]{\frac{19.53}{15.625}} - 1 = 0.0772 \text{ say } 7.72\%$$

**(10 Marks)**

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

Current Beta for share portfolio = 1.6

Beta for cash = 0

Current portfolio beta = 0.85 x 1.6 + 0 x 0.15 = 1.36

**(ii) Portfolio beta after 3 months:**

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 = ₹ 100 lakh x (1.00 - 0.02)

= ₹ 98 lakh

Mark-to-market paid = ₹ 2 lakh

Cash balance after payment of mark-to-market = ₹ 13 lakh

Value of portfolio after 3 months = ₹85 lakh x (1 - 0.032) + ₹13 lakh

= ₹95.28 lakh

Change in value of portfolio $= \frac{₹100 \text{ lakh} - ₹95.28 \text{ lakh}}{₹100 \text{ lakh}}$

= 4.72%

Portfolio beta = 0.0472/0.02 = 2.36

**(4 Marks)**

**6. (a)** Initial Margin = $\mu + 3\sigma$

Where $\mu$ = Daily Absolute Change

$\sigma$ = Standard Deviation

Accordingly

Initial Margin = ₹ 10,000 + ₹ 6,000 = ₹ 16,000

Maintenance margin = ₹ 16,000 x 0.75 = ₹ 12,000

| Day | Changes in future Values (₹) | Margin A/c (₹) | Call Money (₹) |
|---|---|---|---|
| 4/2/09 | - | 16000 | - |
| 5/2/09 | 50 x (3294.40 - 3296.50) = -105 | 15895 | - |
| 6/2/09 | 50 x (3230.40 - 3294.40) = -3200 | 12695 | - |
| 7/2/09 | 50 x (3212.30 - 3230.40) = -905 | 16000 | 4210 |
| 10/2/09 | 50 x (3267.50 - 3212.30) = 2760 | 18760 | - |
| 11/2/09 | 50 x (3263.80 - 3267.50) = -185 | 18575 | - |
| 12/2/09 | 50 x (3292 - 3263.80) =1410 | 19985 | - |
| 14/2/09 | 50 x (3309.30 - 3292) = 865 | 20850 | - |
| 17/2/09 | 50 x (3257.80 - 3309.30) = -2575 | 18275 | - |
| 18/2/09 | 50 x (3102.60 - 3257.80) = -7760 | 16000 | 5485 |

**(8 Marks)**

**(b)** First of all we shall calculate premium payable to bank as follows:

$$P = \frac{rp}{\left[(1 \div i) - \frac{1}{i \times (1+i)^t}\right]} \text{ X A or } \frac{rp}{PVAF(3.5\%,4)} \times A$$

Where

P = Premium

A = Principal Amount

rp = Rate of Premium

i = Fixed Rate of Interest

t = Time

$$= \frac{0.01}{\left[(1/0.035) - \frac{1}{0.035 \times 1.035^4}\right]} \times £15,000,000 \text{ or}$$

$$\frac{0.01}{(0.966 + 0.933 + 0.901 + 0.871)}$$

× £15,000,000

$$= \frac{0.01}{\left[(28.571) - \frac{1}{0.0402}\right]} \times £15{,}000{,}000 = £\ 40{,}595 \text{ or } \frac{£150{,}000}{3.671} = £\ 40{,}861$$

Now we see the net payment received from bank.

| Reset Period | Additional interest due to rise in interest rate | Amount received from bank | Premium paid to bank* | Net Amt. received from bank |
|---|---|---|---|---|
| 1 | £ 75,000 | £ 75,000 | £ 40,861 | £34,139 |
| 2 | £ 112,500 | £ 112,500 | £ 40,861 | £71,639 |
| 3 | £ 150,000 | £ 150,000 | £ 40,861 | £109,139 |
| **TOTAL** | **£ 337,500** | **£ 337,500** | **£122,583** | **£ 214,917** |

Thus, from above it can be seen that interest rate risk amount of £ 337,500 reduced by £ 214,917 by using of Cap option.

* Alternatively, if premium paid is considered as £ 40,595, then above figure of £ 214,917 shall be changed to £ 215,715. **(6 Marks)**