PAPER – 2 : ADVANCED FINANCIAL MANAGEMENT

PART I – Case Scenario based MCQs (30 Marks)

Answer all Questions.

Case Scenario-I

The company X Ltd. proposes to take over Y Ltd. The chief executive of a company thinks that shareholders always look for the earnings per share. Therefore, he considers maximization of the earnings per share as his company's objective. The following information is available in respect of X Ltd. and Y Ltd.

	X Ltd.	***Y Ltd.***
Net Profit	*80 Lakh*	*15.75 Lakh*
P/E ratio	*10.50*	*15.75*
Current market price per share	*₹ 42*	*₹ 85*

From the information given above, choose the correct answer to the Question no. 1 to 3 : ***(3 × 2 = 6 Marks)***

1. *If the company borrows funds @ 15% rate of interest and buys out Target Company by paying cash, how much should he offer to maintain his EPS assuming tax rate @ 30%.*

   A. 210 Lakhs

   B. 315 Lakhs

   C. 150 Lakhs

   D. 0 Lakhs

2. *Maximum exchange ratio which the company should offer so that the company could keep EPS at current level is*

   A. 1:0.952

   B. 1:2.125

C. *1:2.023*

D. *1:0.196*

3. *No. of shares to be issued by X Ltd.*

A. *3.9375 lakhs*

B. *1.7639 lakhs*

C. *3.7485 lakhs*

D. *0.3631 lakhs*

Case Scenario-II

Based on the following information, choose the correct answer from the following questions:

Situation	***Action***	***Exercise Price***	***Premium***	***Spot Price***
I	*Exercised*	*140*	*20*	*160*
II	*Exercised*	*200*	*15*	*175*
III	*Lapsed*	*300*	*25*	*400*

From the information given above, choose the correct answer to the Question no. 4 to 6: ***(3 × 2 = 6 Marks)***

4. *In Situation III, the investor's position and the amount of profit / loss is:*

A. *Put option, ₹ (25)*

B. *Call option, ₹ 75*

C. *Short position, ₹ 100*

D. *Long position, ₹ (100)*

5. *In Situation I, the investor's position and the amount of profit or loss is :*

A. *Put option and ₹ 20*

B. *Call option and ₹ 0*

C. *Put option and ₹ 0*

D. *Call option and ₹ 20*

6. *In Situation II, the investor's position and the amount of profit / loss is :*

   A. *Put option and ₹ 10*

   B. *Call option and ₹ 10*

   C. *Put option and ₹ 25*

   D. *Call option and ₹ 25*

Case Scenario-III

The following information is available in respect of Bond 1 and Bond 2

	Bond 1	***Bond 2***
Face value, redeemable value at par	*₹ 1000*	*₹ 1000*
Coupon rate, payable annually (%)	*6%*	*10%*
Time to maturity (years)	*5*	*3*

An investor has the portfolio consisting of 75% of Bond 1 and 25% of Bond 2. The current YTMs prevailing in the market is 10%.

Year (n) :	*1*	*2*	*3*	*4*	*5*
PVIF (10%, n) :	*0.9091*	*0.8264*	*0.7513*	*0.6830*	*0.6209*

From the information given above, choose the correct answer to the question no. 7 to 10: ***(4 × 2 = 8 Marks)***

7. *New price of the portfolio if YTM changes from 10% of 10.5% based on the duration is:*

   A. *₹ 870.12*

   B. *₹ 902.36*

   C. *₹ 1832.23*

   D. *₹ 1864.45*

8. *What should be the price and duration of Bond - 2?*

   A. *₹ 826.43 and 2.49*

   B. *₹ 1,000 and 2.74*

   C. *₹ 924.85 and 2.74*

   D. *₹ 1,000 and 2.49*

9. *What should be the price and duration of Bond – 1?*

   A. *₹ 848.34 and 4.43*

   B. *₹ 811.09 and 4.38*

   C. *₹ 1,227.44 and 4.43*

   D. *₹ 658.15 and 3.90*

10. *What will be the price sensitivity of the portfolio?*

   A. *-4.027*

   B. *-2.491*

   C. *-3.643*

   D. *-3.981*

Case Scenario-IV

Z Ltd. paid a dividend of ₹ 5 for the current year. The dividend is expected to grow at 25% for the next 6 years and at 10% per annum thereafter. The return of government bond is 13% per annum and market return is expected to be around 20%. The correlation between market return and Z Ltd. share return is 0.3733. The standard deviation of market return and Z Ltd. shares is 12% and 18% respectively.

Round off to two decimal places.

From the information given above, choose the correct answer to the Question no. 11 to 15: ***(5 × 2 = 10 Marks)***

11. *What is the intrinsic value of Z Ltd. shares?*

   A. *₹ 156.69*

   B. *₹ 303.14*

   C. *₹ 349.62*

   D. *₹ 341.30*

12. *What is the present value at the end of 4th year?*

   A. *₹ 23.71*

   B. *₹ 12.56*

C. *₹ 6.53*

D. *₹ 6.99*

13. *What is the expected return of Z Ltd shares?*

A. *15%*

B. *23.92%*

C. *16.92%*

D. *16.5%*

14. *What is value in perpetuity at the start of the 6th year?*

A. *₹ 156.69*

B. *₹ 303.14*

C. *₹ 349.62*

D. *₹ 341.30*

15. *If current market price of the shares is ₹ 315 than stock is*

A. *Over valued*

B. *Under valued*

C. *Fairley valued*

D. *Cannot be determined*

ANSWER TO PART – I CASE SCENARIO BASED MCQS

1. Option C

2. Option B

3 Option A

4. Option A

5. Option B

6. Option A

7. Option A

8. Option B

9. Option A

10. Option C

11. Option A

12. Option C

13. Option C

14. Option B

15. Option A

PART – II DESCRIPTIVE QUESTIONS

*Answer Question No.**1** which is compulsory and any **4** out of the remaining **5** questions.*

Working notes should form part of the respective answer.

Question 1

(a) Following is the data regarding Three Securities.

Stock	***Expected Return (%)***	***Std. deviation***	***Correlation with the Market return***
A	*19%*	*2.50*	*0.840*
B	*13.50%*	*2.00*	*0.540*
C	*11.00%*	*0.80*	*0.975*
Market risk	*-*	*1.20*	*-*
Market rate of return	*14.00%*	*-*	*-*
Risk free rate*	*9.00%*	*-*	*-*

** In the Question Paper mistakenly it got typed as tree.*

(i) Advise which of the above stocks are over, under or correctly valued in the market?

(ii) What will be strategy you would like to recommend? ***(6 Marks)***

(b) A firm is considering a proposal to set up a cement manufacturing plant with an initial investment of ₹ 150 crore. The firm has the option to abandon the project after one year by selling it to a competitor for ₹ 100 crore if the market conditions are unfavorable and the demand is low, the

project's value will decline by 60%. However, if the market conditions turn out to be favorable and the demand for cement is high, the value of the project at the end of year 1 will increase by 50%.

Given that the risk free rate of interest as 8%, what will be the value of the abandonment option and the value of the project with abandonment option? ***(4 Marks)***

(c) This decision determines the division of earnings between payments to shareholders and reinvestment in the company. What this decision is called? What are other decisions falling in this strategy? Briefly explain.

(4 Marks)

Answer

(a) (i) To decide which of this security is over, under or correctly valued we need to compute the Required Rate of Return of each Stock using CAPM for which Beta shall be calculated as follows:

$$\text{Beta of Stock A } (\beta_A) = \frac{0.840 \times 2.50}{1.20} = 1.75$$

$$\text{Beta of Stock B } (\beta_B) = \frac{0.540 \times 2.00}{1.20} = 0.90$$

$$\text{Beta of Stock C } (\beta_C) = \frac{0.975 \times 0.80}{1.20} = 0.65$$

Required rate of return is given by CAPM

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

For Stock A $R_A = 9\% + 1.75 (14\% - 9\%) = 17.75\%$

Stock B $R_B = 9\% + 0.90 (14\% - 9\%) = 13.50\%$

Stock C $R_C = 9\% + 0.65 (14\% - 9\%) = 12.25\%$

Stock	**Required rate of return %**	**Expected rate of return %**	**Valuation**
A	17.75%	19.00%	Under Valued
B	13.50%	13.50%	Correctly Valued
C	12.25%	11.00%	Over Valued

(ii) Strategy

Stock	Decision
A	Buy
B	Hold
C	Sell

(b) Decision Tree showing pay off

Year 0 Year 1 Option Pay off

225 0

-150

60 100 - 60 = 40

First of all, we shall calculate probability of high demand (p) using risk neutral method as follows:

8% = p x 50% + (1-p) x (-60%)

0.08 = 0.50 p - 0.60 + 0.60p

p = 068/1.10= 0.618 or 0.62

The value of abandonment option will be as follows:

Expected Payoff at Year 1

= p x 0 + [(1-p) x 40]

= 0.618 x 0 + [0.382 x 40]

= ₹ 15.28 crore

Since expected pay off at year 1 is ₹ 15.28 crore. Present value of expected pay off will be:

$\frac{15.28}{1.08}$ = ₹ 14.15 crore

Thus, the value of abandonment option is ₹ 14.15 crore.

Value of Project with abandonment option -

(i) If PVF is not considered

Expected Value of the Project without abandonment option

= (0.618 x ₹ 225 crore + 0.382 x ₹ 60 crore) – ₹ 150 crore

= ₹ 11.97 crore

Value of Project with abandonment Option

= ₹ 11.97 crore + ₹ 14.15 crore = ₹ 26.12 crore

Or

Expected Value of the Project without abandonment option

= (0.62 x ₹ 225 crore + 0.38 x ₹ 60 crore) – ₹ 150 crore

= ₹ 12.30 crore

Value of Project with abandonment Option

= ₹ 12.30 crore + ₹ 14.15 crore = ₹ 26.45 crore

(ii) If PVF is considered

Expected Value of the Project without abandonment option

= (0.618 x ₹ 225 crore + 0.382 x ₹ 60 crore)/1.08 – ₹ 150 crore

= - ₹ 0.028 crore OR - ₹ 0.03

Value of Project with abandonment Option

= - ₹ 0.028 crore + ₹ 14.15 crore = ₹ 14.122 crore OR ₹ 14.12 crore

Or

Expected Value of the Project without abandonment option

= (0.62 x ₹ 225 crore + 0.38 x ₹ 60 crore)/1.08 – ₹ 150 crore

= ₹ 00.28 crore

Value of Project with abandonment Option

= ₹ 0.28 crore + ₹ 14.15 crore = ₹ 14.43 crore

(c) The decision determines the division of earnings between payments to shareholders and reinvestment in the company is called Dividend Decision.

The other key decisions falling within the scope of financial strategy are as follows:

1. ***Financing decisions:*** These decisions deal with the mode of financing or mix of equity capital and debt capital.
2. ***Investment decisions:*** These decisions involve the profitable utilization of firm's funds especially in long-term projects (capital projects). Since the future benefits associated with such projects are not known with certainty, investment decisions necessarily involve risk. The projects are therefore evaluated in relation to their expected return and risk.
3. ***Portfolio decisions:*** These decisions involve evaluation of investments based on their contribution to the aggregate performance of the entire corporation rather than on the isolated characteristics of the investments themselves.

Question 2

(a) Mr. X invested ₹ 1,00,000 at a face value of ₹ 10 per unit in a dividend reinvestment plan in a mutual fund during its initial public offering on 1st July, 2022. On 31stMarch, 2023, the mutual fund declared a dividend of 10%. At that time Mr. X calculated his holding period return to be 115%

On 31 March, 2024 the mutual fund declared a dividend of 20% and Mr. X redeemed all his investment and calculated his holding period return to be 193.134%.

You are required to calculate

(i) The NAVs as on 31.03.2023 and 31.03.2024.

(ii) Calculate the total units redeemed. ***(6 Marks)***

(b) PQ Ltd. expects sales of ₹ 100 lakhs in the year 1. The same will increase by ₹ 20 lakhs per year over the next four years. At the end of 5 years the project would be wound up. The Deprecation will be charged at 20% p.a. on straight line method. The expenses excluding the depreciation will be 40% of the sales. There will be no salvage value of the plant. PQ Ltd. proposes to invest in the plant an amount where the Net Present Value will be Zero.

Corporate Tax rate is 30%.

You are required to calculate the investment which can be made in the plant. ***(8 Marks)***

Answer

(a) (i) Yield for 9 months = 115%

Market value of Investments as on 31.03.2023

= 1,00,000 + (1,00,000 x 115%)

= ₹ 2,15,000/-

Therefore, NAV as on 31.03.2023 = (2,15,000-10,000)/10,000=₹ 20.50

(NAV would stand reduced to the extent of dividend payout, being (₹ 1,00,000 x 10%) = ₹ 10,000

Since dividend was reinvested by Mr. X, additional units acquired:

$$= \frac{₹\ 10,000}{₹\ 20.50} = 487.80 \text{ units}$$

Therefore, total units as on 31.03.2023 = 10,000 + 487.80 = 10,487.80

Alternately, total units as on 31.03.2023 = (2,15,000/20.50) = 10,487.80

Dividend as on 31.03.2024 = 10,487.80 x 10 x 0.2 = ₹ 20,975.60

Market Value of Investment as on 31.03.2024

= ₹ 1,00,000+₹ 1,00,000(193.134%)

= ₹ 2,93,134

Thus, NAV per Unit as on 31.03.2024 = ₹ (2,93,134-20,975.60) / 10,487.80

= ₹ 25.95

(ii) Calculation of total numbers of Units redeemed

No. of Units issued on 31.03.2024 = $\frac{20,975.60}{25.95}$ = 808.31 units

Thus, total number of units redeemed = 10487.80 + 808.31 = 11296.11 units

(b) Working Notes:

(1) Expected Sales

Year	Expected Sales
1	₹ 100 lakhs
2	₹ 120 lakhs
3	₹ 140 lakhs
4	₹ 160 lakhs
5	₹ 180 lakhs

(2) Expected Expenses excluding Depreciation

Year	Exp.
1	₹ 40 lakhs
2	₹ 48 lakhs
3	₹ 56 lakhs
4	₹ 64 lakhs
5	₹ 72 lakhs

(3) Cash Inflow from the Project

Let P be the cost of the plant then chargeable depreciation for each year shall be 0.20P. Accordingly, annual cash flow from the project shall be computed as follows:

Year	Expected Sales ₹ lakhs	Exp. ₹ lakhs	Dep. (3)	Profit Before Tax	Tax @30%	Profit After Tax
1	100	40	0.20P	60 - 0.20P	18 – 0.06P	42 – 0.14P
2	120	48	0.20P	72 - 0.20P	21.6 – 0.06P	50.4 – 0.14P
3	140	56	0.20P	84 - 0.20P	25.2 – 0.06P	58.8 – 0.14P
4	160	64	0.20P	96 - 0.20P	28.8 – 0.06P	67.2 – 0.14P
5	180	72	0.20P	108 - 0.20P	32.4 – 0.06P	75.6 – 0.14P

Year	Profit After Tax	Dep. Added Back	Cash Inflow
1	42 – 0.14P	0.20P	42 + 0.06P
2	50.40 – 0.14P	0.20P	50.40 + 0.06P
3	58.80 – 0.14P	0.20P	58.80 + 0.06P
4	67.20 – 0.14P	0.20P	67.20 + 0.06P
5	75.60 – 0.14P	0.20P	75.60 + 0.06P
Total			294 + 0.30P

Since NPV will be Zero the required comes as follows:

Sum of Cash Inflows – Plant Cost = 0

294 + 0.30P – P = 0

P = 420

Thus, the required investment to be made in plant shall be ₹ 420 lakhs.

Alternative solution if a discount rate of 10% is applied, though students may solve the question using a rate other than 10%.

Working Notes:

(1) Expected Sales

Year	Expected Sales
1	₹ 100 lakhs
2	₹ 120 lakhs
3	₹ 140 lakhs
4	₹ 160 lakhs
5	₹ 180 lakhs

(2) Expected Expenses excluding Depreciation

Year	Exp.
1	₹ 40 lakhs
2	₹ 48 lakhs

3	₹ 56 lakhs
4	₹ 64 lakhs
5	₹ 72 lakhs

(3) Cash Inflow from the Project

Let P be the cost of the plant then chargeable depreciation for each year shall be 0.20P. Accordingly, annual cash flow from the project shall be computed as follows:

Year	Expected Sales ₹ lakhs	Exp. ₹ lakhs	Dep. (3)	Profit Before Tax	Tax	Profit After Tax
1	100	40	0.20P	60 - 0.20P	18 – 0.06P	42 – 0.14P
2	120	48	0.20P	72 - 0.20P	21.6 – 0.06P	50.4 – 0.14P
3	140	56	0.20P	84 - 0.20P	25.2 – 0.06P	58.8 – 0.14P
4	160	64	0.20P	96 - 0.20P	28.8 – 0.06P	67.2 – 0.14P
5	180	72	0.20P	108 - 0.20P	32.4 – 0.06P	75.6 – 0.14P

Year	Profit After Tax	Dep. Added Back	Cash Inflow	PVF @ 10%	PV of Cash Inflow
1	42 – 0.14P	0.20P	42 + 0.06P	0.909	38.178 + 0.05454P
2	50.40 – 0.14P	0.20P	50.40 + 0.06P	0.826	41.6304 + 0.04956P
3	58.80 – 0.14P	0.20P	58.80 + 0.06P	0.751	44.1588 + 0.04506P
4	67.20 – 0.14P	0.20P	67.20 + 0.06P	0.683	45.8976 + 0.04098P
5	75.60 – 0.14P	0.20P	75.60 + 0.06P	0.621	46.9476 + 0.03726P
Total					216.8124 + 0.2274P

Since NPV will be Zero the required comes as follows:

Sum of Cash Inflows – Plant Cost = 0

216.8124 + 0.2274P – P = 0

P = 280.63

Thus, the required investment to be made in plant shall be ₹ 280.63 lakhs.

Question 3

(a) XY Ltd. is planning to expand its operations in view of growing demand for its products. For this purpose, it is considering to borrow an amount of ₹ 100 crores for a period of 3 months in the coming 6 months' time from now. The current rate of interest is 8% per annum but due to inflation it may go up in 6 months' time. The company wants to hedge itself against the likely increase in interest rate.

The company's Bankers quoted an FRA (Forward Rate Agreement) at 8.20% per annum.

You are required to calculate due to FRA:

(i) The actual interest rate if the Banker pays to XY Ltd. an amount of ₹ 9,78,952.52

(ii) The actual interest rate if XY Ltd. will pay to the Banker a sum of ₹ 9,80,872.98 ***(6 Marks)***

(b) On 20.10.2024, the balance in NOSTRO account with XYZ Bank in London was GBP 80000 and the balance in overbought was GBP 50000. During the day the following transactions have taken place.

Events	***Amount (GBP)***
DD Purchased	*25,000*
Purchased a bill on London	*75,000*
Sold forward TT	*50,000*
Forward purchased contract cancelled	*25,000*
Remitted by TT	*42,500*
Draft in London cancelled	*20,000*

What steps would you take, if you are required to maintain a credit balance of GBP 10,000 in the NOSTRO account and keep as overbought position on GBP 32,500? ***(8 Marks)***

Answer

(a) Final settlement amount shall be computed by using formula:

$$= \frac{(N)(RR - FR)(dtm/DY)}{[1 + RR(dtm/DY)]}$$

Where,

N = the notional principal amount of the agreement;

RR = Actual Reference Rate for the maturity specified by the contract prevailing on the contract settlement date;

FR = Agreed-upon Forward Rate; and

dtm = maturity period in days or months of the forward rate agreement

DY = Total number of days or month in a year as per convention

Accordingly,

i. If Banker pays to XY Ltd. an amount of ₹ 9,78,952.52 then actual interest shall be computed as follows:

$$₹\ 9,78,952.52 = \frac{(₹\ 100\ crore)(RR - 0.082)(3/12)}{[1 + RR(3/12)]}$$

$$RR = 0.086$$

Thus, the actual interest rate happens to be 8.60% on the settlement date.

ii. If XY Ltd. pays to Banker an amount of ₹ 9,80,872.98 then actual interest shall be computed as follows:

$$— ₹\ 9,80,872.98 = \frac{(₹\ 100crore)(RR - 0.082)(3/12)}{[1 + RR(3/12)]}$$

$$RR = 0.078$$

Thus, the actual interest rate happens to be 7.80% on the settlement date.

(b) Exchange Position:

Particulars	Purchase GBP	Sale GBP
Opening Balance Overbought	50,000	—
DD Purchased	25,000	—
Purchased bill on London	75,000	—
Forward Sales – TT	—	50,000
Cancellation of Forward Contract	—	25,000
Remitted by TT	—	42,500

Draft on London cancelled	20,000	—
	1,70,000	1,17,500
Closing Balance Overbought	—	52,500
	1,70,000	1,70,000

Cash Position (Nostro A/c)

	Credit	Debit
Opening balance (credit)	80,000	—
Remitted by TT	—	42,500
	80,000	42,500
Closing balance (credit)	—	37,500
	80,000	80,000

The Bank has to sell spot TT GBP 27,500 to decrease the balance in Nostro account to GBP 10,000.

This would bring down the overbought position to GBP 25,000.

Since the bank requires an overbought position of GBP 32,500, it has to buy forward GBP 7,500.

Question 4

(a) On January 1, 2023 an investor has a portfolio of 5 securities as given below:

Security	***Price (Rs.)***	***No. of shares***	***Beta***
A	*612.65*	*3000*	*?*
B	*334.20*	*5000*	*1.15*
C	*454.45*	*6000*	*0.40*
D	*775.10*	*10000*	*0.95*
E	*781.05*	*3000*	*0.85*

Portfolio beta is 0.859

The cost of capital to the investor is 10.5% p.a.

You are required to calculate:

(i) The beta of Security A.

(ii) The theoretical value of the Nifty futures for February, 2023. Current value of Nifty 6500.

(iii) The number of contract of Nifty the investor needs to sell to get a full hedge until February, for his portfolio, if the current value of Nifty is 6500 and Nifty futures have a minimum trade lot requirement of 200 units. Assume that the Futures are trading at their fair value.

(iv) What will be new beta if 4 Future contracts are sold to the investors?

No. of days in a year be traded as 365 days

Given: In (1.105) = 0.0998, $e^{0.015858}$ = 1.01598 and $e^{0.01668}$ = 1.01682

(b) Economic Value Added (EVA) of ABC Lad was ₹ 31,10,000 ***(6 Marks)***

Following is the capital structure of ABC Ltd. at the end of current financial year

Equity (Share Capital + Reserves & Surplus)	*₹ 170 lakhs*
Debt (Coupon Rate 10%)	*₹ 80 lakhs*
Invested Capital	*₹ 250 lakhs*

Following data is given to estimate the cost of equity capital:

Beta of ABC Ltd.	*0.90*
Risk-free rate (i.e., current yield on Govt. Bonds)	*8%*
Average market risk premium	*10%*

Economic Value Added (EVA) of ABC Ltd was ₹ 31,10,000.

The applicable corporate income tax rate is 30%.

You are required to calculate the Profit After Tax of ABC Ltd. ***(4 Marks)***

(c) Succession planning is a good way for companies to ensure that businesses are fully prepared to promote and advance all employees - not just those who are at the management or executive levels.

Do you agree? Justify. ***(4 Marks)***

OR

(c) MN Bank entered into a plain Vamila Swap through an, OIS (Overnight Index Swap) on a principal of ₹ 5 crores and agreed to receive MIBOR overnight floating rates for a fixed payment on the principal. The swap was entered into on Monday 2nd August and was to commence on 3rd August and run for a period of 7 days.

Respective MIBOR rates for Tuesday to Monday were

8.00%, 8.25%, 8.15%, 7.90%, 7.95%, 8.15%.

MN Bank received ₹ 275 net of settlement.

Working is to be rounded off. Bank does not accept decimal values.

You are required to calculate the fixed rate and Interest under both legs where Sunday is holiday. ***(4 Marks)***

Answer

(a) (i) Calculation of beta of Security A

Let beta of Security A is β_A

Security	Price of the Stock	No. of shares	Value	Weightage w_i	Beta B_i	Weighted Beta
A	612.65	3,000	18,37,950	0.113	β_A	0.113 β_A
B	334.20	5,000	16,71,000	0.102	1.15	0.117
C	454.45	6,000	27,26,700	0.167	0.40	0.067
D	775.10	10,000	77,51,000	0.475	0.95	0.451
E	781.05	3,000	23,43,150	0.143	0.85	0.122
			1,63,29,800			0.757 + 0.113 β_A

Since the Portfolio beta is 0.859, the beta of Security A shall be:

$0.757 + 0.113\ \beta_A = 0.859$

$\beta_A = 0.903$ or 0.90

(ii) Calculation of Theoretical Value of Future Contract

Cost of Capital = 10.5% p.a. Accordingly, the Continuously Compounded Rate of Interest ln (1.105) = 0.0998

For February 2023 contract, t = 58/365 = 0.1589

Further $F = Se^{rt}$

$F = ₹\ 6{,}500e^{(0.0998)(0.1589)}$

$F = ₹\ 6{,}500e^{0.015858}$

$F = ₹\ 6{,}500X1.01598 = ₹\ 6{,}603.87$

Alternatively, it can also be taken as follows:

$= ₹\ 6500\ e^{0.105\times 58/365}$

$= ₹\ 6500\ e^{0.01668}$

= ₹ 6500 x 1.01682 = ₹ 6,609.33

(iii) When total portfolio is to be hedged:

$$= \frac{\text{Value of Spot Position requiring hedging}}{\text{Value of Future Contract}} \times \text{Portfolio Beta}$$

$$= \frac{16329800}{6603.87 \times 200} \times 0.859 = 10.62 \text{ contracts say 11 contracts}$$

Or

$$= \frac{16329800}{6609.33 \times 200} \times 0.859 = 10.61 \text{ contracts say 11 contracts}$$

(iv) Revised Portfolio Beta if 4 Future contracts are sold to investor:

$4 = (\beta_{P₹} - 0.859)\ x\frac{16329800}{6603.87\times 200}$

$\beta_{P₹} = 1.18$

Or

$4 = (\beta_{P₹} - 0.859)\ x\frac{16329800}{6609.33\times 200}$

$\beta_{P₹} = 1.18$

(b) To compute Profit after Tax (PAT) of ABC Ltd. first we shall compute Cost of Equity, Cost of Debt and WACC as follows:

Cost of Equity (k_e) as per CAPM

k_e = 8% + 0.90 x 10% = 17%

Post Tax Cost of Debt (k_d) = 10% (1 – 0.30) = 7.00%

$$\text{WACC} = 17\% \times \frac{170}{250} + 7\% \times \frac{80}{250}$$

= 11.56% + 2.24% = 13.80%

EVA = Net Operating Profit after Tax (NOPAT) – (Invested Capital x WACC)

₹ 31,10,000 = NOPAT – (₹ 2,50,00,000 x 0.1380)

NOPAT = ₹ 65,60,000

$$\text{Operating Profit} = \frac{65,60,000}{0.70} = ₹\ 93,71,429$$

Calculation of profit after Tax

Operating Profit	₹ 93,71,429
Less: Interest	₹ 8,00,000
Profit before Tax	₹ 85,71,429
Less: Tax @ 30%	₹ 25,71,429
Profit after Tax	₹ 60,00,000

(c) Yes, I agree with this statement because Succession planning is the process of identifying the critical positions within an organization and developing action plans for individuals to assume those positions. A succession plan identifies future need of people with the skills and potential to perform leadership roles. Succession planning is an important priority for family owned businesses as most of them are managed by a non-family leader even though the ownership lies with the family. Taking a holistic view of current and future goals, this type of preparation ensures that the right people are available for the right jobs today and in the years to come. It can also provide a liquidity event, which enables the transfer of ownership in a going concern to rising employees.

Need for Succession Planning

1. **Risk mitigation –** If existing leader quits, then searches can take six-nine months for suitable candidate to close. Keeping an organization without leader can invite disruption, uncertainty, conflict and endangers future competitiveness.

2. **Cause removal –** If the existing leader is culpable of gross negligence, fraud, willful misconduct, or material breach while discharging duties and has been barred from undertaking further activities by court, arbitral tribunal, management, stakeholders or any other agency.
3. **Talent pipeline –** Succession planning keep employees motivated and determined as it can help them obtaining more visibility around career paths expected, which would help in retaining the knowledge bank created by company over a period of time and leverage upon the same.
4. **Conflict Resolution Mechanism –** This planning is very helpful in promoting open and transparent communication and settlement of conflicts.
5. **Aligning –** In family owned business succession planning helps to align with the culture, vision, direction and values of the business.

OR

(c)

Day	Principal (₹)	MIBOR (%)	Interest (₹)
Tuesday	5,00,00,000	8.00	10,959
Wednesday	5,00,10,959	8.25	11,304
Thursday	5,00,22,263	8.15	11,169
Friday	5,00,33,432	7.90	10,829
Saturday & Sunday (*)	5,00,44,261	7.95	21,800
Monday	5,00,66,061	8.15	11,179
Total Interest @ Floating			77,240
Less: Net Received			275
Expected Interest @ fixed			76,965
Thus, Fixed Rate of Interest			0.0802635
Approx.			8.03%

Alternatively, if students have assumed 360 days a year then solution will be as follows:

Day	Principal (₹)	MIBOR (%)	Interest (₹)
Tuesday	5,00,00,000	8.00	11,111
Wednesday	5,00,11,111	8.25	11,461
Thursday	5,00,22,572	8.15	11,325
Friday	5,00,33,897	7.90	10,980
Saturday & Sunday (*)	5,00,44,877	7.95	22,103
Monday	5,00,66,980	8.15	11,335
Total Interest @ Floating			78,315
Less: Net Received			275
Expected Interest @ fixed			78,040
Thus, Fixed Rate of Interest			0.0802697
Approx.			8.03%

Question 5

(a) PQR Ltd. is considering a project in US, which involve an initial investment *of ₹ 124.50 Crore. The project will have useful life of 5 years Current spot exchange rate is INR/USD is 83. The risk free rate in US is 4.186% and the same in India is 6.9768%. Cash inflows in USD from the project are as follows:*

Year	***1***	***2***	***3***	***4***	***5***
Cash inflow	*30,00,000*	*40,00,000*	*50,00,000*	*60,00,000*	*70,00,000*

PQR Ltd. is expecting net surplus of ₹ 1858.08 lakh to be received after closure of the project. There is no salvage value. PQR Ltd. want to take a forward cover to protect itself from exchange rate fluctuations.

N	***1***	***2***	***3***	***4***	***5***
PVIF (6.976%, n)	*0.935*	*0.874*	*0.817*	*0.764*	*0.714*
PVIF (4.186%, n)	*0.959*	*0.921*	*0.884*	*0.849*	*0.815*
PVIF (12%, n)	*0.893*	*0.797*	*0.712*	*0.636*	*0.567*
PVIF (15%, n)	*0.870*	*0.756*	*0.658*	*0.572*	*0.497*

You are required to recommend the INR/USD rate for the forward cover?

(6 Marks)

(b) *AMN Ltd. has surplus cash of ₹ 200 lakhs and wants to distribute 30% of it to the shareholders. The company decides to buy back shares. The Finance officer of the company estimates that it share price after repurchase is likely to be 15% above the buyback price if the buyback route is taken. The number of shares outstanding at present is 15 lakhs and the current EPS is ₹ 3.00.*

Bought Back price is to be rounded off to one decimal point.

You are required to determine.

(i) The price at which the shares can be repurchased, if the market capitalisation of the company should be ₹ 250 lakhs after buyback.

(ii) The number of shares that can be repurchased.

(iii) The impact of share repurchase on the EPS, assuming that net income is the same. ***(4 Marks)***

(c) *Mohan buys 10,000 shares of X Ltd. @ ₹ 25 per share whose beta value is 1.5 and sells 5,000 shares of A Ltd. @ ₹ 40 per share having a beta value of 2. He obtains a complete hedge by buying 25 Nifty Futures. He closes out his position at the closing price of the next day when the share of X Ltd. has fallen by 4% and Nifty Futures has dropped by 2.50%. In the process he suffered a loss of ₹ 16625.*

You are required to determine

(i) The value of the Nifty future

(ii) Initial cash outlay

(iii) Cash inflow at the close out

(iv) Percentage Gain/loss to Shares of A Ltd. at the time of closure

(4 Marks)

Answer

(a) Let F be the recommended INR/USD rate for the forward cover. Accordingly, year-wise equivalent cash inflows in Indian Rupees shall be as follows:

Year	Cash Inflow in USD Lakh	Cash Inflow in ₹ Lakh
1	30.00	30.00F
2	40.00	40.00F
3	50.00	50.00F
4	60.00	60.00F
5	70.00	70.00F

Now let us compute Net Present Value of project assuming a discount rate of 12% as follows:

Year	PVF@12%	Cash flow in ₹ Lakh	PV in ₹ Lakh
0	1.00	- 12450.00	- 12450.00
1	0.893	30.00F	26.79F
2	0.797	40.00F	31.88F
3	0.712	50.00F	35.60F
4	0.636	60.00F	38.16F
5	0.567	70.00F	39.69F
			172.12F - 12450

Since expected surplus after closure of the project is ₹ 1858.08 Lakh, we can compute the value of F as follows:

1858.08 = 172.12F – 12450

F = 83.13

Thus, for forward cover the rate of ₹ 83.13/ USD is recommended.

Alternatively, if students have assumed discounting rate as 15% then answer will be as follows:

Let F be the recommended INR/USD rate for the forward cover. Accordingly, year-wise equivalent cash inflows in Indian Rupees shall be as follows:

Year	Cash Inflow in USD Lakh	Cash Inflow in ₹ Lakh
1	30.00	30.00F
2	40.00	40.00F
3	50.00	50.00F
4	60.00	60.00F
5	70.00	70.00F

Now let us compute Net Present Value of project assuming a discount rate of 15% as follows:

Year	PVF@15%	Cash flow in ₹ Lakh	PV in ₹ Lakh
0	1.00	- 12450.00	- 12450.00
1	0.870	30.00F	26.10F
2	0.756	40.00F	30.24F
3	0.658	50.00F	32.90F
4	0.572	60.00F	34.32F
5	0.497	70.00F	34.79F
			158.35F - 12450

Since expected surplus after closure of the project is ₹ 1858.08 Lakh, we can compute the value of F as follows:

1858.08 = 158.35F – 12450

F = 90.36

Thus, for forward cover the rate of ₹ 90.36/ USD is recommended.

Alternative Solution if students have assumed that the discounting rate 15% for the given cash inflows then applicable discounting rates for the project is -

(1 + 0.06978) / (1 + Risk Premium) = (1 + 0.15)

Or, 1 + Risk Premium = 1.15/1.06978 = 1.0750

Therefore, Risk adjusted dollar rate is = (1.0750 x 1.04186) -1 = 1.1199 – 1
= 0.12

Calculation of NPV

Year	Cash flow US$ lakh	PV Factor at 12%	PV (US$ lakh)
1	30.00	0.893	26.79
2	40.00	0.797	31.88
3	50.00	0.712	35.60
4	60.00	0.636	38.16
5	70.00	0.567	39.69
			172.12
		Less: Investment	150.00
		NPV	22.12

Since PQR Ltd. is expecting a net surplus of ₹ 1858.08 lakh after the closure of the project the recommended rate of INR/ USD is (₹ 1858.08 lakh/ USD 22.12 lakh) ₹ 84.00.

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

Market Capitalisation after Buyback

1.15P (Original Shares – Shares Bought Back)

$= 1.15P\left(15 \text{ lakhs} - \frac{30\% \text{ of } 200 \text{ lakhs}}{P}\right) = ₹ 250 \text{ lakhs}$

$= 17.25 \text{ lakhs} \times P - 60 \text{ lakhs} \times 1.15$

$= 17.25 \text{ lakhs } P - 69 \text{ lakhs}$

Again, 17.25 lakhs P – 69 lakhs

or 17.25 lakhs P = 250 lakhs + 69 lakhs

or $P = \frac{319}{17.25} = ₹ 18.5$ per share or ₹ 18.50

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

$\frac{60 \text{ lakhs}}{18.5}$ = 3.243243 lakhs (Approx.) or 3,24,324 share

(iii) Impact on EPS

Exiting EPS = ₹ 3.00

Number of Shares = 15 lakhs

Total Earning = ₹ 3.00 x 15 Lakh = ₹ 45.00 lakhs

Post Buyback number of Shares = 15,00,000 - 3,24,324 = 11,75,676

$\therefore$ Revised EPS = $\frac{45,00,000}{11,75,676}$ = ₹ 3.83 or ₹ 3.8

Thus, EPS of AMN Ltd. increases to ₹ 3.83 or Impact on EPS = ₹ 3.83 - ₹ 3.00 = ₹ 0.83 (Increase) or Impact on EPS = ₹ 3.8 - ₹ 3.0 = ₹ 0.8 (Increase)

(c) (i) Let N be the value of Nifty Future Contract then:

$$\frac{10000\times25\times1.50-5000\times40\times2}{N} = 25$$

N = - 1000

Since Mohan has bought Nifty Futures the above value shall be considered as positive i.e. value of per one Nifty Future is ₹ 1000.

Alternatively, it can also be computed as follows:

$$\frac{5000\times40\times2-10000\times25\times1.50}{N} = 25$$

N = 1000

Accordingly, the value of Nifty Future is ₹ 1000.

(ii) Initial Cash Outlay

= 10000 x ₹ 25 + 1000 x ₹ 25 – 5000 x ₹ 40

= ₹ 2,50,000 + ₹ 25,000 - ₹ 2,00,000 = ₹ 75,000

(iii) Cash inflow at the closeout

₹ 75,000 - ₹ 16,625 = ₹ 58,375

(iv) Percentage Gain/ loss to Shares of A Ltd. at the time of closure

Let the amount realised from the sale of share of A Ltd. is A.

Accordingly, next day at the time of closing out the position will be as follows:

10000 x ₹ 25 (1 – 0.04) + 25 x ₹ 1000 x (1 – 0.025) - A = ₹ 58,375

A = ₹ 2,06,000

Thus, percentage of loss to shares of A Ltd. = $\frac{2,06,000-2,00,000}{2,00,000}$

= 0.03 i.e. 3%

Alternative presentation-

Percentage Gain / Loss to shares of A Ltd. at the time of closure:

Loss suffered by Mohan when he closes out his position at the closing price of the next day		₹ 16,625
Less:		
a. Loss suffered in purchase of shares of X Ltd. (10,000 x 25 x 0.04)	10,000	
b. Loss suffered in Nifty Futures (1,000 x 25 x 0.025)	625	₹ 10,625
Loss suffered in sale of shares of A Ltd.		₹ 6,000

Thus, percentage of loss to shares of A Ltd.= (6,000/2,00,000) x 100 = 0.03 i.e. 3%.

Question 6

(a) A Portfolio Manager (PM) has three mutual funds in has portfolio. Following the details of these three mutual funds:

Particulars	***Growth fund***	***Balanced fund***	***Regular fund***	***Market***
Average Return (%)	*7.5*	*6.3*	*5.4*	
Variance				*50.41*
Sharpe Ratio	*-0.15*	*-0.36*	*-0.48*	
Treynor's Ratio	*-2*	*-3*	*-4.80*	

The yield on 182 days Treasury bill is 9 per cent per annum.

You are required to calculate

(i) Variance of the Funds

(ii) Coefficient of Determination of the Funds ***(8 Marks)***

(b) True Life Inc., a US based company, has won a contract to implement a project in India. The project will require an initial investment of ₹ 8000 million. The whole project along with the equipment will be sold to the Indian Government for ₹ 9600 million in one-year time. Since the Indian Government will pay for the amount in Indian Rupee (₹), the company is worried about exposure due to exchange rate volatility.

(i) Construct a swap that will help the True Life Inc. to reduce the exchange rate risk.

(ii) Assume that the Indian Government offers a swap at spot rate which is INR/USD 80 in one year. The spot rate after one year is expected to be INR/USD 84. Further, you may also assume that the True Life Inc., can also take a USD loan at 6% per annum. ***ADVISE*** *whether the company should opt for this option or just do nothing.* ***(6 Marks)***

Answer

(a) (i) Variance of different Funds can be calculated by using Sharpe Ratio as follows:

(a) Growth Fund

Let σ_G be the Standard Deviation of Growth Fund. Accordingly

$$-0.15 = \frac{7.50-9.00}{\sigma_G}$$

$\sigma_G = 10$

Hence the variance of Growth Fund $(\sigma_G)^2 = 100$

(b) Balanced Fund

Let σ_B be the Standard Deviation of Balanced Fund. Accordingly

$$-0.36 = \frac{6.30-9.00}{\sigma_B}$$

$\sigma_B = 7.50$

Hence the variance of Growth Fund $(\sigma_B)^2 = 56.25$

(c) Regular Fund

Let σ_R be the Standard Deviation of Regular Fund. Accordingly

$$-0.48 = \frac{5.40-9.00}{\sigma_R}$$

$\sigma_R = 7.50$

Hence the variance of Growth Fund $(\sigma_R)^2 = 56.25$

(ii) To determine the Coefficient of Determination we need the Coefficient of Correlation which can be determined by computing β using the Treynor Ratio as follows:

(a) Growth Fund

Let β_G be the Beta of Growth Fund. Accordingly

$$-2 = \frac{7.50-9.00}{\beta_G}$$

$\beta_G = 0.75$

$$\text{Since Beta} = \frac{\sigma_G Corr._{G,M}}{\sigma_M}$$

and $\sigma_G = 10$ and $\sigma_M = \sqrt{50.41} = 7.1$

$$\text{Hence } 0.75 = \frac{10\,Corr._{G,M}}{7.10}$$

$Corr._{G,M} = 0.5325$ or 0.53 and

Coefficient of Determination of Growth Fund = $(0.5325)^2 = 0.2836$ or $(0.53)^2 = 0.28$

(b) Balanced Fund

Let β_B be the Beta of Balanced Fund. Accordingly

$$-3 = \frac{6.30-9.00}{\beta_B}$$

β_B = 0.90

Since Beta = $\frac{\sigma_B Corr._{B,M}}{\sigma_M}$

and σ_B = 7.50 and σ_M = $\sqrt{50.41}$ = 7.1

Hence 0.90= $\frac{7.50 Corr._{B,M}}{7.10}$

$Corr._{B,M}$ = 0.852 or 0.85 and

Coefficient of Determination of Balanced Fund = $(0.852)^2$ = 0.7259 or $(0.85)^2$ = 0.73

(c) Regular Fund

Let β_R be the Beta of Regular Fund. Accordingly

- 4.80 = $\frac{5.40-9.00}{\beta_R}$

β_R = 0.75

Since Beta = $\frac{\sigma_R Corr._{R,M}}{\sigma_M}$

and σ_R = 7.50 and σ_R = $\sqrt{50.41}$ = 7.1

Hence 0.75= $\frac{7.50 Corr._{R,M}}{7.10}$

$Corr._{R,M}$ = 0.71 and

Coefficient of Determination of Regular Fund = $(0.71)^2$ = 0.5041 or 0.50

(b) (i) The following swap arrangement can be entered by True Life Inc.

(1) Swap a US$ loan today at an agreed rate with any party to obtain Indian Rupees (₹) to make initial investment.

(2) After one year swap back the Indian Rupees with US$ at the agreed rate. In such case the company is exposed only on the profit earned from the project.

(ii) With the swap

	Year 0 (Million US$)	Year 1 (Million US$)
Buy ₹ 8000 million at spot rate of 1 US$ = ₹ 80	(100.00)	-----
Swap ₹ 8000 million back at agreed rate of ₹ 80		100.00
Sell ₹ 1600 million at 1 US$ = ₹ 84		19.05
Interest on US$ loan @6% for one year		(6.00)
	(100.00)	**113.05**

Net result is a net receipt of US$ 13.05 million.

Without the swap

	Year 0 (Million US$)	Year 1 (Million US$)
Buy ₹ 8000 million at spot rate of 1 US$ = ₹ 80	(100.00)	
Sell ₹ 9600 million at 1 US$ = ₹ 84		114.29
Interest on US$ loan @6% for one year		(6.00)
	(100.00)	**108.29**

Net result is a net receipt of US$ 8.29 million.

Decision: Since the net receipt is higher in swap option the company should opt for the same.