STRATEGIC FINANCIAL MANAGEMENT

Time Allowed: 3 Hours **Full Marks: 100**

The figures in the margin on the right side indicate full marks.

SECTION – A (Compulsory)

I. Choose the correct alternative. **[15 x 2 =30]**

(i) **The IRR of a project is 10%. If the annual cash flow after tax is ₹1,30,000 and project duration is 4 years, whatis the initial investment in the project?**

(a) ₹4,10,000
(b) ₹4,12,100
(c) ₹3,90,000
(d) ₹4,05,000

(ii) **Which of the following is/are not true regarding the risk adjusted investment appraisal techniques?**

i. **In the certainty equivalent method, if there is high degree of correlation between the cashflows for the entire project life the certainty equivalent coefficient is taken as one for all the years.**

ii. **In sensitivity analysis, the impact of the changes in one or more variables on the criterion of merit isstudied.**

iii. **Simulation does not produce an optimal solution but the user of the technique has to generate all possible combinations of conditions and constraints to choose the optimal solution.**

(a) Only (ii) above.
(b) Only (iii) above.
(c) Both (i) and (ii) above
(d) Both (i) and (iii) above

(iii) **Given, expected value of profit without perfect information = ₹1,600 and expected value of perfect information = ₹300, then expected value of profit with perfect information will be _____.**

(a) ₹1,300
(b) ₹1,900
(c) ₹950
(d) None of the above

(iv) **The type of lease that includes a third party, a lender, is called as which of the following?**

(a) Sale and lease back
(b) Leveraged Lease
(c) Direct leasing arrangement
(d) Operating lease

(v) **The current price is ₹100, the required rate of return is 20% and the dividend paid ₹3.00 on a share of₹10 face value. What is the expected growth rate?**

(a) 15%
(b) 16%

(c) 18%
(d) 17%

(vi) In the bull market
(a) The stock prices are increasing
(b) Each peak is higher than the previous peak
(c) Each bottom is higher than the previous bottom
(d) Both (b) and (c)

(vii) Mr. X expects 20% return from his investment. The dividend fromthe stock is ₹2.0 and the present price is ₹50. What should be the future price of the stock?
(a) ₹56.39
(b) ₹58.00
(c) ₹60.00
(d) ₹62.30

(viii) Yield to maturity is same as
(a) NPV
(b) IRR
(c) Geometric mean
(d) Both (b) and (c)

(ix) If opening units 1,25,000 Units subscribe 2,00,000, Units redeem 50,000 then Closing units?
(a) 3,25,000 units
(b) 2,75,000 units
(c) 3,75,000 units
(d) 2,50,000 units

(x) A portfolio comprises two securities and the expected return on them is 12% and 16% respectively. Determine return of portfolio if first security constitutes 40% of total portfolio.
(a) 12.4%
(b) 13.4%
(c) 14.4%
(d) 15.4%

(xi) An investor buys 100 shares of a sugar mill at ₹210 per share and at the same time writes a September 250 call at a premium of ₹20 per share. If the expiration date price is ₹280, calculate the net gain/loss.
(a) ₹20
(b) ₹40
(c) ₹60
(d) None of the above

(xii) With respect to capital market theory, the average beta of all assets in the market is:
(a) Less than 1.0.

(b) Equal to 1.0
(c) Greater than 1.0.
(d) None

(xiii) The United States Dollar is selling in India at ₹45.20. If the interest rate for a 6-months borrowing in India is 10% and the corresponding rate in USA is 4%, what would be the rate of forward premium/(discount)?
(a) 5.93 %
(b) 5.88 %
(c) (5.17%)
(d) (5.52%)

(xiv) Plain vanilla interest rate swaps involved
(a) Fixed to fixed rate swap
(b) Fixed to floating rate swap
(c) Floating to floating rate swap
(d) Currency swap

(xv) The portfolio's risk premium is 12% and the standard deviation of market and the portfolio are 4 and 3, respectively. The fund's beta value is 1.5. The Treynor index is
(a) 3.0
(b) 8.0
(c) 4.0
(d) 12

Answer:

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)
b	c	b	b	d	d	b	d	b	c	c	b	b	b	b

SECTION – B

(Answer any 5 questions out of 7 questions given. Each question carries 14 marks.)

[5 x 14 = 70]

2. (a) X Ltd. an existing profit-making company, is planning to introduce a new product with a projected life of 8 years. Initial equipment cost will be ₹120 lakhs and additional equipment costing ₹10 lakhs will be needed at the beginning of third year. At the end of the 8 years, the original equipment will have resale value equivalent to the cost of removal, but the additional equipment would be sold for ₹1 lakhs. Working Capital of ₹15 lakhs will be needed. The 100% capacity of the plant is of 4,00,000 units per annum, but the production and sales- volume expected are as under:

Year	Capacity in percentage
1	20
2	30
3-5	75
6-8	50

A sale price of ₹100 per unit with a profit-volume ratio of 60% is likely to be obtained. Fixed Operating Cash Cost are likely to be ₹16 lakhs per annum. In addition to this the advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure in ₹ lakhs each year	30	15	10	4

The company is subject to 40% tax, straight-line method of depreciation, (permissible for tax purposes also) and taking 15% as appropriate after-tax Cost of Capital, should the project be accepted? [7]

(b) Beta Ltd is considering the acquisition of a personal computer costing ₹50,000. The effective life of the computer is expected to be five years. The company plans to acquire the same either by borrowing ₹50,000 from its bankers at 15% interest p.a. or on lease. The company wishes to know the lease rentals to be paid annually, which match the loan option. The following further information is provided to you:

a) **The principal amount of loan will be paid in five annual equal instalments.**
b) **Interest, lease rentals, principal repayment are to be paid on the last day of each year.**
c) **The full cost of the computer will be written off over the effective life of computer on a straight-line basis and the same will be allowed for tax purposes**
d) **The company's effective tax rate is 40% and the after-tax cost of capital is 9%**
e) **The computer will be sold for ₹1,700 at the end of the 5th Year. The commission on such sales is 9% on the sale value.**

You are required to compute the annual lease rentals payable by Beta Ltd, which will result in indifference to the loan option. [7]

Answer:

(a) Computation of initial cash outlay (₹ in lakhs)

Equipment Cost (at year 0)	120
Working Capital (at year 0)	15
	135

Calculation of cash inflows

Year	1	2	3-5	6-8
Sales (in units)	80,000	1,20,000	3,00,000	2,00,000
	₹	₹	₹	₹
Contribution @ ₹ 60 p.u.	48,00,000	72,00,000	1,80,00,000	1,20,00,000
Fixed cost	16,00,000	16,00,000	16,00,000	16,00,000
Advertisement	30,00,000	15,00,000	10,00,000	4,00,000
Depreciation	15,00,000	15,00,000	16,50,000	16,50,000
Profit/(loss)	(13,00,000)	26,00,000	1,37,50,000	83,50,000
Tax @ 40%	Nil	10,40,000	55,00,000	33,40,000
Profit/(loss) after tax	(13,00,000)	15,60,000	82,50,000	50,10,000
Add: Depreciation	15,00,000	15,00,000	16,50,000	16,50,000
Cash Inflow	2,00,000	30,60,000	99,00,000	66,60,000

Computation of PV of Cash Inflow (₹)

Year	CIF (₹)	PV Factor @ 15%	(₹)
1	2,00,000	0.8696	1,73,920
2	30,60,000	0.7561	23,13,666
3	99,00,000	0.6575	65,09,250
4	99,00,000	0.5718	56,60,820
5	99,00,000	0.4972	49,22,280
6	66,60,000	0.4323	28,79,118
7	66,60,000	0.3759	25,03,494
8	66,60,000	0.3269	21,77,154
WC	15,00,000	0.3269	4,90,350
SV	(1,00,000)	0.3269	(32,690)
			2,75,97,362
PV of COF_0			1,35,00,000
Additional Investment = ₹ 10,00,000 × 0.7561			7,56,100
NPV			1,33,41,262

Recommendation: Accept the project in view of positive NPV.

(b) Computation of Net Cash outflow if the Asset is Purchased by Borrowing

Year	Principal repayment (₹)	Interest (₹)	Installment (₹)	Tax savings on interest (₹)	Tax savings on dep (₹)	Net cash outflow (₹)	PV @ 9%	Present value (₹)
1	10,000	7,500	17,500	3,000	4,000	10,500	0.91743	9,633
2	10,000	6,000	16,000	2,400	4,000	9,600	0.84168	8,080
3	10,000	4,500	14,500	1,800	4,000	8,700	0.77218	6,718
4	10,000	3,000	13,000	1,200	4,000	7,800	0.70843	5,526
5	10,000	1,500	11,500	600	4,000	6,900	0.64993	4,485

Present Value of Total outflow of cash		₹34,442
Less: Present value of terminal cash inflows:		
Sale value of asset	₹ 1,700	
(-) Commission	₹ 153	₹ 1,547
(-) Tax on profit @ 40%		₹ 619
		₹ 928
Its Present value ₹ (928 × 0.64993)		₹ 603
Net cash outflow = 34,442 – 603		= ₹33,839

Since we are required to find the annual lease rental payable, which will result in indifference to loan option. The present value of net cash outflow will be the same in each case.

Computation of break-even lease rent:

Let X be the break-even lease rent

Present value of cash inflows:

Lease rent		₹ X
(-) Tax saving	(X @ 40%)	₹ 0.4X
Lease rent after tax per year		₹ 0.6X

Present value of lease rental for five years = (0.6X) × (3.8896) = 33,839

or, X = ₹14,500.
So, the required annual lease rental is ₹14,500.

3. (a) A company is considering two mutually exclusive projects X and Y. Project X costs ₹3,00,000 and Project Y ₹3,60,000. You have been given below the net present value, probability distribution for each project:

Project X		Project Y	
NPV Estimate (₹)	**Probability**	**NPV Estimate (₹)**	**Probability**
30,000	**0.1**	**30,000**	**0.2**
60,000	**0.4**	**60,000**	**0.3**
1,20,000	**0.4**	**1,20,000**	**0.3**
1,50,000	**0.1**	**1,50,000**	**0.2**

Compute the expected net present value of Projects X and Y.

(i) Compute the risk attached to each project i.e., Standard Deviation of each probability distribution.

(ii) Which project do you consider riskier and why?

(iii) Compute the profitability index of each project. [7]

(b) The rates of return on the Security of company S and Market Portfolio for 10 periods are given below:

Year	1	2	3	4	5	6	7	8	9	10
Return on Security S (%)	20	22	25	21	18	-5	17	19	-7	20
Return on Market Portfolio	22	20	18	16	20	8	-6	5	6	11

(i) Compute the beta of Security S?

(ii) Determine the Characteristic Line for Security S?

(iii) Analyse the Systematic and Unsystematic Risk of Security S? [7]

Answer:

(a) Project X

NPV Estimate (N_i) (₹)	Probability (P_i)	NPV Estimate × Probability ($N_i \times P_i$) (₹)	Deviation from Expected NPV i.e., ₹90,000 (₹)	Square of the deviation (₹)	Square of the deviation × Probability (₹)
30,000	0.1	3,000	– 60,000	3,60,00,00,000	
60,000	0.4	24,000	– 30,000	90,00,00,000	36,00,00,000
1,20,000	0.4	48,000	30,000	90,00,00,000	36,00,00,000
1,50,000	0.1	15,000	60,000	3,60,00,00,000	36,00,00,000
		Expected NPV = 90,000			1,44,00,00,000

Project Y

NPV Estimate (N_i) (₹)	Probability (P_i)	NPV Estimate × Probability ($N_i \times P_i$) (₹)	Deviation from Expected NPV i.e., ₹90,000 (₹)	Square of the deviation (₹)	Square of the deviation × Probability (₹)
30,000	0.2	6,000	– 60,000	3,60,00,00,000	72,00,00,000

60,000	0.3	18,000	– 30,000	90,00,00,000	27,00,00,000
1,20,000	0.3	36,000	30,000	90,00,00,000	27,00,00,000
1,50,000	0.2	30,000	60,000	3,60,00,00,000	72,00,00,000
		Expected NPV = 90,000			1,98,00,00,000

(i) The expected NPV of projects X and Y is ₹90,000.

(ii) Standard deviation of NPV for project X = $\sqrt{1440000000}$ = ₹37,947

Standard deviation of NPV for project X = $\sqrt{1980000000}$ = ₹44,497

(iii) Coefficient of variation = $\frac{\text{Standard Deviation}}{\text{Expected NPV}}$

For project X: Coefficient of variation = 37947/90000 = 0.42

For project Y: Coefficient of variation = 44497/90000 = 0.4944 i.e., 0.50

Therefore, Project Y is riskier since it has a higher coefficient of variation.

(iv) Profitability Index = $\frac{\text{Discounted cash inflow}}{\text{Discounted cash outflow}}$

For project X: Profitability Index = (90000 + 300000)/ 300000 = 1.30

For project Y: Profitability Index = (90000 + 360000)/ 360000 = 1.25

(b) (i) Computation of Beta of Security

Period	R_M	R_S	$D_M = (R_M - \bar{R}_M)$	$D_S = (R_S - \bar{R}_S)$	D_M^2	D_S^2	$D_M \times D_S$
(1)	(2)	(3)	(4)=[(2)-12]	(5)=[(3)-15]	(6) = (4)^2	(7)=(5)^2	(8)=(4)×(5)
1	22	20	10	5	100	25	50
2	20	22	8	7	64	49	56
3	18	25	6	10	36	100	60
4	16	21	4	6	16	36	24
5	20	18	8	3	64	9	24
6	8	-5	-4	-20	16	400	80
7	-6	17	-18	2	324	4	-36
8	5	19	-7	4	49	16	-28
9	6	-7	-6	-22	36	484	132
10	11	20	-1	5	1	25	-5
	120	150			706	1148	357

	Market Portfolio	Security of Company S
Mean	$\bar{R}_M = \sum R_M \div n = 120 \div 10 = 12$	$\bar{R}_M = \sum R_M \div n = 120 \div 10 = 12$
Variance	$\sigma_M^2 = \Sigma D_M^2 \div n = 706 \div 10 = 70.6$	$\Sigma_S^2 = \Sigma D_S^2 \div n = 1148 \div 10 = 114.8$
Standard Deviation	$\sigma_M = \sqrt{70.60} = 8.40$	$\sigma_S = \sqrt{114.80} = 10.71$

Covariance and Correlation:

Combination	Market and S
Covariance	$Cov_{MS} = \sum[D_M \times D_S] \div n = 357 \div 10 = 35.7$

Beta β_S	$B_S = Cov_{MS}/\sigma_M^2 = 35.7/70.6 = 0.51$

(ii) Computation of Characteristic Line for Security S

Particulars	Value
$y = \bar{R}_A$	15
β	0.51
$x = \bar{\bar{R}}_M$ (Expected Return on Market Index)	12

Characteristic Line for Security S = $y = \alpha + \beta x$, $\alpha = 15 - (0.51 \times 12) = 8.88\%$

$15 = \alpha + (0.51 \times 12)$

Characteristic line for Security S = $8.88 + 0.51\ R_M$

Note: It is assumed that Rates of Return for Market Portfolio and the Security given in the question is returns in excess of Risk Free Rate of Return.

(iii) Analysis of Risk into Systematic Risk and Unsystematic Risk

Particulars	Standard Deviation Approach	Variance Approach
Total Risk	10.71%	114.80%
Systematic Risk	$\beta \times \sigma_m = 0.51 \times 8.40 = 4.284\%$	$\beta^2 \times \sigma_m^2 = 0.51^2 \times 70.60 = 18.363\%$
Unsystematic Risk [Total Risk - Systematic Risk]	10.71 - 4.284 = 6.426%	= 114.80 - 18.363 = 96.437%

4. (a) For the first four years, India Incorporated is assumed to grow at a rate of 10%. After four years, the growth rate of dividend is assumed to decline linearly to 6 percent. After 7 years, it is assumed to grow at a rate of 6% infinitely. The next year dividend is ₹2.00 per share and the required rate of return is 14%. Find the value of the stock. [7]

(b) There are two mutual funds viz. X mutual fund and Y mutual fund. Each having closed-ended equity schemes. NAV as on 31-12-2022 of equity schemes of X mutual fund is ₹70.71 (consisting 99% equity and remaining cash balance) and that of Y mutual fund is ₹62.50 (consisting 96% equity and balance in cash).

Following is the other information:

Particulars	Equity Schemes	
	X Mutual Fund	Y Mutual Fund
Sharpe ratio	2	3.3
Treynor ratio	5	15
Standard deviation	11.25	5

There is no change in portfolios during the next months and annual average cost is ₹3 per unit for the schemes of both the mutual funds. For calculation, consider 12 months in a year and ignore number of days for particular month. Calculate NAV after one month if the market goes down by 5%. [7]

Answer:

(a) $$P_0 = \sum_{t=1}^{A} \frac{D_0(1+g_a)^t}{(1+k)^t} + \sum_{t=A+1}^{B} \frac{D_{t-1}(1+g_b)}{(1+k)^t} + \frac{D_B(1+g_n)}{k-g_n(1+k)^B}$$

Where $D_0 = 2.00$; $g_a = 0.10$; $g_n = 0.06$;
$k = 0.14$; D_B = declining rate of return from 10% to 6 %, i.e. 0.09, 0.08, 0.07, 0.06.
B = 7 years (the beginning of phase III)

Step I $$= \sum_{t=1}^{A} \frac{D_0(1+g_a)^t}{(1+k)^t} = \frac{2}{(1.14)} + \frac{2(1.1)}{(1.14)^2} + \frac{2(1.1)^2}{(1.14)^3} + \frac{2(1.1)^3}{(1.14)^4}$$

$= 1.754 + 1.693 + 1.633 + 1.576$
$= ₹6.656$

Step II $$= \sum_{t=A+1}^{B} \frac{D_{t-1}(1+g_b)}{(1+k)^t}$$

$$= \frac{2(1.1)^3(1.09)}{(1.14)^5} + \frac{2(1.1)^3(1.09)(1.08)}{(1.14)^6} + \frac{2(1.1)^3(1.09)(1.08)(1.07)}{(1.14)^7} = ₹4.27$$

Step III $$= \frac{D_B(1+g_n)}{k-g_n(1+k)^B} = \frac{2(1.1)^3(1.09)(1.08)(1.07)(1.06)}{(0.14-0.06)\times 2.5023} = ₹17.761$$

Step IV Add all the above components (I+II+III)
$= ₹(6.66 + 4.27 + 17.76)$ $= ₹28.69$

The present value of the stock is ₹28.69

Conclusion: We have moved from constant growth model to two-phase growth model and three-plus growth model, with each model, the number of variables and complexity of computation have increased. If growth models are over simplified, inadequate information would be provided by the forecasts. If they are too complex, the results or forecasts made by the computation are likely to be inaccurate. Hence, the analyst has to trade off between manageability and accuracy. Estimating year-by-year growth rate into an infinite future is quite impossible. At the same time, giving a simple average growth rate for the future is not fully dependable. The analyst has to strike a balance between the complexity and manageability of the known information for predicting the value of the stock.

(b) Working Notes:

(i) Decomposition of funds in equity and cash components

	Mutual Fund X	Mutual Fund Y
NAV on 31/12/22 (₹)	70.71	62.50
(%) of Equity	99%	96%
Equity element in NAV	₹70.00	₹60.00

Cash element in NAV	₹0.71	₹2.50

(ii) Calculation of Beta

(a) 'X' mutual fund

$$\text{Sharpe ratio} = 2 = \frac{E(R) - R_f}{\sigma_x} = \frac{ER - R_f}{11.25}$$

or $E(R) - R_f = 22.50$

$$\text{Treynor ratio} = 15 = \frac{E(R) - R_f}{\beta_x} \text{ or } 15\beta_x = 22.50 \Rightarrow \beta_x = 22.50 / 15 \text{ or } 1.50$$

(b) 'Y' mutual fund

$$\text{Sharpe ratio} = 3.3 = \frac{E(R) - R_f}{\sigma_y} = \frac{E(R) - R_f}{5} \text{ or } E(R) - R_f = 16.50$$

$$\text{Treynor ratio} = 15 = \frac{E(R) - R_f}{\beta_y} = \frac{16.50}{\beta_y} \text{ or } \beta_y = \frac{16.50}{15} = 1.1$$

(iii) Decrease in the value of equity

	Mutual Fund X	Mutual Fund Y
Market goes down by	5.00%	5.00%
Beta	1.50	1.10
Equity component goes down	7.50%	5.50%

(iv) Balance of cash after 1 month

	Mutual Fund X	Mutual Fund Y
Cash in hand on 31-12-22	₹0.71	₹2.50
Less: expenses per month	₹0.25	₹0.25
Balance after 1 month	0.46	₹2.25

NAV after 1 month

	Mutual Fund X	Mutual Fund Y
Value of equity after 1 month		
70×(1-0.075)	₹64.75	--
60×(1-0.055)	--	₹56.70
Cash balance	0.46	2.25
Balance after 1 month	65.21	58.95

5. (a) Subho has invested in four securities M, N, O and P, the particulars of which are as follows —

Security	**M**	**N**	**O**	**P**
Amount Invested (₹)	**1,25,000**	**1,50,000**	**80,000**	**1,45,000**
Beta (β)	**0.60**	**1.50**	**0.90**	**1.30**

If RBI Bonds carries an interest rate of 8% and NIFTY yields 14%, compute the expected return on portfolio. If investment in Security O is replaced by investment in RBI Bonds, what corresponding change will be there in Portfolio Beta and expected return? [7]

(b) Based on the data provided below, compute and compare the performance of the portfolios using the Jensen model of the differential return.

Portfolio	Realized Return on Portfolio (%)	Portfolio (β)
1	14.5	1.2
2	9.5	0.8
3	18.0	1.4

Return on market portfolio, R_m = 12%

Risk-free rate of interest = 6% [7]

Answer:

(a) (i) Computation of Expected Return on Portfolio (Under CAPM)

(a) Computation of Weighted Beta (Beta of the Portfolio)

Security	Amount Invested (₹)	Proportion of Investment to Total Investment	Beta of Investment	Weighted Beta
(1)	(2)	(3) = (2) ÷ 5,00,000	(4)	(5) = (3) × (4)
M	1,25,000	0.25	0.60	0.150
N	1,50,000	0.30	1.50	0.450
O	80,000	0.16	0.90	0.144
P	1,45,000	0.29	1.30	0.377
Total	5,00,000	1.00		1.121

(b) Computation of Expected Return on Portfolio

Expected Return $[E(R_p)] = R_f + [\beta_p \times (R_m - R_f)]$

$= 8\% + [1.121 \times (14\% - 8\%)]$

$= 8\% + [1.121 \times 6\%]$

$= 8\% + 6.726\%$

$= 14.726\%$

(ii) Computation of Expected Return [Investment in O, replaced by RBI Bonds] (CAPM)

(a) Computation of Weighted Beta (Beta of the Portfolio)

Security	Amount Invested (₹)	Proportion of Investment to Total Investment	Beta of Investment	Weighted Beta
(1)	(2)	(3) = (2) ÷ 5,00,000	(4)	(5) = (3) × (4)
M	1,25,000	0.25	0.60	0.150
N	1,50,000	0.30	1.50	0.450
RBI Bonds	80,000	0.16	0.00	0.000
P	1,45,000	0.29	1.30	0.377
Total	5,00,000	1.00		0.977

(b) Computation of Expected Return on Portfolio

Expected Return [E(RP)]

$= R_f + [\beta_p \times (R_m - R_f)]$

$= 8\% + [0.977 \times (14\% - 8\%)]$

= 8% + [0.977 × 6%]
= 8% + 5.862%
= 13.862%

(b)

Required return based on CAPM for the three portfolios would be:
Portfolio 1: 6% + (12% – 6%) × 1.2 = 13.2%
Portfolio 2: 6% + (12% – 6%) × 0.8 = 10.8%
Portfolio 3: 6% + (12% – 6%) × 1.4 = 14.4%

The difference between actually realized return and return under CAPM is portfolio alpha (α) and they are as follows:

Portfolio 1 (α) = 14.5 – 13.2 = + 1.30%
Portfolio 2 (α) = 9.5 – 10.8 = – 1.30%
Portfolio 3 (α) = 18.0 – 14.4 = + 3.60%

The best performance is of the portfolio manager 3 having the highest value of positive alpha. The next best is portfolio 1. Portfolio 2 is underperforming as its alpha value is negative.

6. (a) Decide which position on the index future gives a speculator, a complete hedge against the following transitions:

(i) The share of Yes Limited is going to rise. He has a long position on the cash market of ₹100 Lakhs on the Yes Limited. The beta of the Yes Limited is 1.25.

(ii) The share of No Limited is going to depreciate. He has a short position on the cash market of ₹50 Lakhs on the No Limited. The beta of the No Limited is 0.90.

(iii) The share of Fair Limited is going to stagnant. He has short position on the cash market of ₹40 Lakhs of the Fair Limited. The beta of the Fair Limited is 0.75. [7]

(b) A put and a call option each have an expiration date 6 months hence and an exercise price ₹9. The interest rate for the 6 month period is 3 percent.

(a) If the put has a market price of ₹2 and share is worth ₹10 per share, compute the value of the call.

(b) If the put has a market price of ₹2 and the call ₹4. determine the value of the share per share.

If the call has a market value of ₹5 and market price of the share is ₹12 per share what is the value of the put? [7]

Answer:

(a) (i) Value to be traded in Futures [Index Value] = Hedge Ratio × Amount of Portfolio

(ii) Principles for deciding the Position on Index Futures [Opposite Position in relation to Stock]

Expectation on Stock Price	Action in Stock Market	Position in Index Futures
Rise	Buy / Long	Sell/Short
Fail	Sell/Short	Buy/Long

(iii) Position on the Index Futures

Sl. No.	Co.	Trend	Amount (₹)	Beta /Hedge Ratio	Index Value (₹)	Position
(a)	Yes Ltd.	Rise	100 Lakhs	1.25	1,25,00,000 [100 Lakhs × 1.25]	Short
(b)	No Ltd.	Depreciate	50 Lakhs	0.90	45,00,000 [50 Lakhs × 0.90]	Long
(c)	Fair Ltd.	Stagnant	40 Lakhs	0.75	30,00,000 [40 Lakhs × 0.75]	Long

(b) Under Put Call Parity -

→ Value of Call + Present Value of Exercise Price = Current Spot Price + Value of Put

→ $C + EP \times e^{-rt} = SP_0 + P$

Case (a)	Case (b)	Case (c)
→ $C + EP \times e^{-rt} = SP_0 + P$	→ $C + EP \times e^{-rt} = SP_0 + P$	→ $C + EP \times e^{-rt} = SP_0 + P$
→ $C = SP_0 + P - EP \times e^{-rt}$	→ $SP_0 = C + EP \times e^{-rt} - P$	→ $P = C + EP \times e^{-rt} - SP_0$
→ $C = 10+2 - (9 \times e^{-0.03 \times (6/12)})$	→ $SP_0 = 4 + (9 \times e^{-0.03 \times (6/12)}) - 1$	→ $P = 5 + 9 \times e^{-0.03 \times (6/12)} - 12$
→ $C = 12 - (9 \div 1.01511)$	→ $SP_0 = 4 + (9 \div 1.01511) - 1$	→ $P = 5 + 8.86 - 12$
→ $C = 12 - 8.86 = 3.14$	→ $SP_0 = 11.86$	→ $P = 1.86$
Value of Call = ₹3.14	Value of Share = ₹11.86	Value of Put = ₹1.86

7. (a) Following are the details of cash inflows and outflows in foreign currency denominations of M Co., an Indian export firm, which have no foreign subsidiaries —

Currency	Inflow	Outflow	Spot rate	Forward rate
US $	**4,00,00,000**	**2,00,00,000**	**48.01**	**48.82**
French Franc (F Fr)	**2,00,00,000**	**80,00,000**	**7.45**	**8.12**
UK £	**3,00,00,000**	**2,00,00,000**	**75.57**	**75.98**
Japanese Yen	**1,50,00,000**	**2,50,00,000**	**3.20**	**2.40**

(a) Determine the net exposure of each foreign currency in terms of Rupees.

(b) Are any of the exposure positions off-setting to some extent? [7]

(b) Following are the USD/INR spot and 3-month forward quotes available. Which currency is in forward premium or discount? Calculate the annualised forward premium or discount.
Spot rate, USD/INR: ₹75.42/50
3-month swap points: 20/30 [7]

Answer:

(a) (1) Computation of Net Exposure

Particulars	US $	F Fr	UK £	Japan Yen
Inflow (in Lakhs)	400.00	200.00	300.00	150.00
Less: Outflow	(200.00)	(80.00)	(200.00)	(250.00)
Net Exposure (Foreign Currency Terms)	200.00	120.00	100.00	(100.00)
Spot Exchange Rate	48.01	7.45	75.57	3.20
Net Exposure (in Rupee Terms	9602	894	7557	(32)

based on Spot Exchange Rate)	[200 × 48.01]	[120 × 7.45]	[100 × 75.57]	[100 × 3.20/10]

Particulars	US $	F Fr	UK£	Japan Yen
Forward Rate [₹, FC]	48.82	8.12	75.98	2.40
Less: Spot Exchange Rate [₹/ FC]	48.01	7.45	75.57	3.20
Forward Premium / (Discount)	0.81	0.67	0.41	(0.80)
Net Exposure in Rupee Terms based on extent of uncertainty represented by Premium/ (Discount)	162.0 [200 × 0.81]	80.4 [120 × 0.67]	41.0 [100 × 0.41]	(8.0) [(100) × (0.8)/10]

(2) Off Setting Position:

(a) Net Exposure in all the currencies is offset by better forward rates. In the case of USD. F Fr and UK Pound, the net exposure is receivable, and the forward rates are quoted at a premium for these currencies.

(b) In case of Japanese Yen, the net exposure is payable, and the forward rate is quoted at a discount. Therefore, a better forward rate is also offsetting the net payable in Japanese Yen.

(b) Calculation of 3-month forward quote

Particulars	Bid rate	Ask rate	Spread
Spot rate	75.42	75.50	0.11%
Swap points (to be added)	0.20	0.30	
3-month Forward rate	75.62	75.80	0.24%

Since, the rates are in bid-ask form, we need to calculate the mid-rate to determine the forward premium and discount.

Spot (USD/INR) $_{mid}$ = (75.42 + 75.50)/2 = ₹75.46/$

3-month Forward (USD/INR) $_{mid}$ = (75.62 + 75.80)/2 = ₹75.71/$

Here, USD has become dearer. Hence, USD is in forward premium and INR is in forward discount.

$$\text{Forward Premium (annualised)} = \frac{\text{Forward Rate} - \text{Spot Rate}}{\text{Spot Rate}} \times \frac{12}{m} \times 100$$

$$= \frac{75.71 - 75.46}{75.46} \times \frac{12}{3} \times 100 = 1.33\%$$

So, USD is in forward premium by 1.33%.

$$\text{Forward discount (annualised)} = \frac{\frac{1}{75.71} - \frac{1}{75.46}}{\frac{1}{75.46}} \times \frac{12}{3} \times 100$$

$$= \frac{0.01321 - 0.013252}{0.013252} \times \frac{12}{3} \times 100 = 1.27\%$$

So, INR is in forward discount by 1.27%.

8. Short Notes on:

(a) Advantages of Digital Financial Services. **[5]**

(b) Participatory Notes. **[5]**

(c) Sale and Lease back. **[4]**

Answer:

(a) Advantages of Digital Financial Services

The advantages of digital financial services include the following:

(i) Improved customer experience: Digital technologies have changed the way financial services were provided. Now, customers enjoy a whole lot of information before the services can be availed. Also, there is the possibility of comparing products and services of different producers and providers before placing an order (e.g., Policybazar provides comparable quotes of insurance products across insurers).

(ii) Ease of access: Because of the intervention of digital technology services can be accessed very easily. The customers need not to visit the branches of the service providers anymore. Everything is possible a click of a mouse.

(iii) Streamlined operations: Financial services in this digital era is much more streamlined. Everything is so well planned. For example, in case of insurance services, from enquiry to customer onboarding, claim management to settlement – everything is now being done online and with minimum requirement of submission of physical documents. Even KYC (Know Your Customer) is also being done electronically.

(iv) Reduction in cost of delivery: Due to enhanced use of digital technology, companies are operating with minimum physical facilities and manpower. This has contributed heavily towards the profitability of the organisations. This savings is being shared with the customers in form of reduction in fees.

(b) Participatory Notes – or P-Notes or PNs – are instruments issued by registered foreign institutional investors to overseas investors, who wish to invest in the Indian stock markets without registering themselves with the market regulator, the Securities and Exchange Board of India (SEBI). Financial instruments used by hedge funds that are not registered with SEBI to invest in Indian securities. Indian-based brokerages to buy India-based securities/ stocks and then issue participatory notes to foreign investors. Any dividends or capital gains collected from the underlying securities go back to the investor.

Since international access to the Indian capital market is limited to FIIs. The market has found a way to circumvent this by creating the device called participatory notes, which are said to account for half the $80 billion that stands to the credit of FIIs. Investing through P-Notes is very simple and hence very popular. Hedge funds, which invest through participatory notes, borrow money cheaply from Western markets and invest these funds into stocks in emerging markets. This gives them double benefit: a chance to make a killing in a stock market where stocks are on the rise; and a chance to make the most of the rising value of the local currency. P-Notes are issued to the real investors on the basis of stocks purchased by the FII. The registered FII looks after all the transactions, which appear as proprietary trades in its books. It is not obligatory for the FIIs to disclose their client details to the SEBI, unless asked specifically.

(c) Sale and Leaseback: By employing sale and lease back arrangement, the lessee may overcome a financial crisis by immediately arranging financial resources.

Under this type of lease agreement, the lessee first purchases the equipment of his choice and then sells it to the lessor firm. The lessor in turn leases out the asset to the same lessee. The main advantage of this method is that the lessee can be rest assured about the quality of the asset and can convert the sale into a lease arrangement after he has the possession of the asset. He can exercise this option even in the case of an existing asset used by him for some time to get a lumpsum cash released from the asset which he can put into some alternative use. The lessor gets the tax benefit for depreciation. This method of financing an asset is also popular when the lessee is in liquidity problems, he can sell the asset to a leasing company and take it back on lease. The fund released therefrom will improve the liquidity position of the lessee and he will continue to use the asset without parting with it.