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)

1. Choose the correct option: **[15 x 2 = 30]**

(i) The following information is available in case of an investment proposal:
NPV at discounting rate of 10% = ₹1,250 and NPV at discounting rate of 11% = (-) ₹200.
The IRR of the proposal is:
(a) 11.86%
(b) 9.87%
(c) 11.96%
(d) 10.86%

(ii) Coefficient of variation _____.
(a) Is an absolute measure of risk
(b) Is given by the product of mean expected return and standard deviation
(c) Is given by mean expected return by standard deviation
(d) Is a relative measure of risk

(iii) A certain mutual fund has a return of 17% with standard deviation of 3.5% and the sharpe ratio is 4. The risk free rate is _____.
(a) 3%
(b) 12.5%
(c) 4%
(d) 7.5%

(iv) The growth in book value per share shows the _____.
(a) Rise in the share price
(b) Increase in the physical assets of the firm
(c) Growth in reserve
(d) Increase in the net worth

(v) A stock with a dividend pay-out ratio of 45%, required rate of return is 15% and a constant growth rate of 10% will have a P/E ratio of _____.
(a) 3 times
(b) 9 times
(c) 8 times
(d) 7.5 times

(vi) A mutual Fund had a Net Asset Value (NAV) of ₹72 at the beginning of the year. During the year, a sum of ₹6 was distributed as Dividend besides ₹ 4 as Capital Gain distributions. At the end of the year, NAV was ₹ 84. Total return for the year is:
(a) 30.56%
(b) 31.56%

(c) 40.56%
(d) 41.56%

(vii) Bond volatility is inversely related to _____.
(a) Yield to maturity
(b) Coupon rate
(c) Both (a) and (b)
(d) None of the above

(viii) Covariance between a stock and a market index and variance of market index are 33.56 and 19.15 respectively. The Beta of stock is:
(a) 1.55
(b) 1.85
(c) 1.75
(d) 1.95

(ix) The following details relate to an investment proposal of XYZ Ltd. Investment outlay — ₹ 100 lakhs, Lease Rentals are payable at ₹180 per ₹1,000, Term of lease — 8 years, Cost of capital—12%. What is the present value of lease rentals, if lease rentals are payable at the end of the year? [Given PV factors at 12% for years (1-8) is 4.9676.
(a) ₹ 98,14,680
(b) ₹ 89,41,680
(c) ₹ 94,18,860
(d) ₹ 96,84,190

(x) A project had an equity beta of 1.4 and is to be financed by a combination of 25% Debt and 75% Equity. Assume Debt Beta as zero, R_f = 12% and R_m = 18%. Hence, the required rate of return of the project is _____.
(a) 18.3%
(b) 17.45%
(c) 16.72%
(d) 12.00%

(xi) This type of risk is avoidable through proper diversification _____.
(a) Portfolio risk
(b) Systematic risk
(c) Unsystematic risk
(d) Total risk

(xii) What should be the price of call, if value of a put - ₹40, market price - ₹180, strike price - ₹200, rate of interest 10% p.a. and time period-3 months?

(a) ₹20
(b) ₹25
(c) ₹30
(d) ₹22

(xiii) Arbitrageur in a foreign exchange market _____.
(a) buys when the currency is low and sells when it is high
(b) buys and sells simultaneously the currency with a view to making riskless profit
(c) sells the currency when he has a receivable in future
(d) buys or sells to take advantage of market imperfections.

(xiv) Digital Finance Cube has_____ dimensions.
(a) Six
(b) Four
(c) Three
(d) Two

(xv) The 90 days' interest rate is 1.85% in USA and 1.35% in the UK and the current spot exchange rate is $ 1.6/£. The 90-day forward rate is _____.
(a) $ 1.607893
(b) $ 1.901221
(c) $ 1.342132
(d) $ 1.652312

Answer:

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

SECTION – B

(Answer any five questions out of seven questions given. Each question carries 14 marks.)
[5 x 14 = 70]

2. (a) Techtronics Ltd., an existing company, is considering a new project for manufacture of pocket video games involving a capital expenditure of ₹ 600 lakhs and working capital of ₹150 lakhs. The capacity of the plant is for an annual production of 12 lakh units and capacity utilisation during the 6-year working life of the projects expected to be as indicated below:

Year	Capacity Utilisation
1	33.33%
2	66.66%
3	90%
4-6	100%

The average price per unit of the product is expected to be ₹200 netting a contribution of 40%. Annual fixed costs, excluding depreciation, are estimated to be ₹480 lakhs per annum

from the third year onwards; for the first and second year it would be ₹240 lakhs and ₹360 lakhs respectively. The average rate of depreciation for tax purposes is 33.33% on the capital assets. No other tax reliefs are anticipated. The rate of income-tax may be taken at 50%.

At the end of the third year, an additional investment of ₹100 lakhs would be required for working capital. The company, without taking into account the effects of financial leverage, has targeted for a rate of return of 15%. You are required to analyse whether the proposal is viable, giving your working notes and analysis.

Terminal value for the fixed assets may be taken at 10% and for the current assets at 100%. Calculation may be rounded off to lakhs of rupees. For the purpose of your calculations, the recent amendments to tax laws with regard to balancing charge may be ignored. [7]

(b) HB Finance Ltd is considering to enter the computer leasing business. Mainframe computers can be purchased for ₹2,00,000 each and, in turn, be leased out at ₹ 50,000 per year for 8 years with the initial payment occurring at the end of first year. You may ignore taxes and depreciation.

(i) Estimate the annual before tax expenses and internal rate of return (IRR) for the company.

(ii) What should be the yearly lease payment charged by the company in order to earn a 20 percent annual compounded rate of return before expenses and taxes?

(iii) Assume that the firm uses the straight-line method of depreciation, there is no salvage value, the annual expenses are ₹ 20,000, and the tax rate is 35%. Calculate the yearly lease payment in order to enable the firm to earn 20 percent after tax annual compound rate of return.

(iv) Further, assume that computer has a resale value of ₹ 40,000. Determine the revised lease rental to enable the firm to earn 20 per cent. [7]

Answer:

(a) Evaluation of Expansion decision under NPV method:

Step 1:	₹ in lakhs
Calculation of PV of cash outflow	
Cost of fixed asset	= 600
Cost of Working capital	= 150
Additional WC required 100×PVF (3yrs 15%) = (100 × 0.66)	= 66
PV of cash outflow	= 816

Step 2:
Calculation of PV of operating cash inflow for six years (working notes) = ₹826 lakhs

Step 3:

Calculation of PV of terminal cash inflow	₹ in Lakhs
Salvage value of terminal cash inflow {600×10/100}	= 60
Less: Tax on profit at 50% [60-53] ×50/100	= 4
Add: WC recovered [100%] [100+150]	= 250
	306

Its present value = 306 × PVF(6 years 15%) =306×0.432 = 132 lakhs

Step 4:

Calculation of NPV	₹ in Lakhs
PV of total cash inflows [Recurring + Terminal i.e.,826+132]	= 958
Less: Outflow	= 816
NPV	= 142

Comment: As NPV is positive, it is advised to implement the new project.

Working Notes:

- Calculation of Operating Cash Inflows

Year	Production	Contribution	Fixed Exp.	Depreciation	PBT	PAT	CIAT	PV at 15%	PV
1	400	320	240	200	(120)	(60)	140	0.870	121.80
2	800	640	360	133	147	74	207	0.756	156.49
3	1080	864	480	89	295	148	237	0.658	155.95
4	1200	960	480	59	421	210	269	0.572	153.87
5	1200	960	480	40	440	220	260	0.497	129.22
6	1200	960	480	26	454	227	253	0.432	109.29

PV of operating cash inflows for 6 years = ₹826.62

(b) (i) Cost of Asset = ₹2,00,000
Life = 8 years
Lease Rent = ₹50,000 p.a.
50,000($PVCF_{8yr, IRR}$) = ₹2,00,000
$PVCF_{8yr, IRR}$ = 4
IRR = 18.63%

(ii) Calculation of yearly lease rent to be charged to earn 20% return
Let the yearly lease rent be X
So, X × $PVCF_{8yr, 20\%}$ = 2,00,000
X = 2,00,000/3.8372
X = ₹ 52,120

(iii) Let X be the yearly lease rent
Computation of cash inflows per annum

Lease rent	X
(-) annual expenses	20,000
(-) Depreciation	25,000
PBT	X - 45,000
PAT @ (1-35%)	0.65X – 29,250
CIAT	0.65X – 4,250

Cash inflows after tax
Present value for 8years @ 20% = (0.65X – 4250) × 3.8372 = 2,00,000
Yearly lease rent X = ₹ 86,725

(iv) Present value of cash outflows:

Cost of computer	2,00,000
Present value of recurring cash inflows	
Lease rent	X
(-) annual expenses	20,000
(-) Depreciation	20,000
PBT	X – 40,000
PAT @ (1-35%)	0.65X - 26,000
CIAT	0.65X- 6000
Present value for 8years @ 20%	= (0.65X-6,000) × 3.872
Present value of terminal cash inflows:	
Resale value	= ₹40,000
Its present value (40,000 × 0.23257)	= ₹9,303
At 20%,	
Inflows = Outflows	
(0.65x – 6,000) × 3.8372 + 9303	= 2,00,000;
Revised lease rent, X	= ₹85,687

3. (a) A firm has an investment proposal, requiring an outlay of ₹40,000. The investment proposal is expected to have 2 years' economic life with no salvage value. In year 1, there is a 0.4 probability that cash inflow after tax will be ₹25,000 and 0.6 probability that cash inflow after tax will be ₹30,000. The probabilities assigned to cash inflows after tax for the year 2 are as follows:

The Cash inflow year 1	₹25,000		₹30,000	
The Cash inflow year 2		**Probability**		**Probability**
	₹12,000	**0.2**	**₹20,000**	**0.4**
	₹16,000	**0.3**	**₹25,000**	**0.5**
	₹22,000	**0.5**	**₹30,000**	**0.1**

The firm uses a 12% discount rate for this type of investment.

(i) Construct a decision tree for the proposed investment project.

(ii) Compute the net present value that the project will yield if worst outcome is realized. Compute the probability of occurrence of this NPV.

(iii) Determine the best occurrence and the probability of that occurrence?

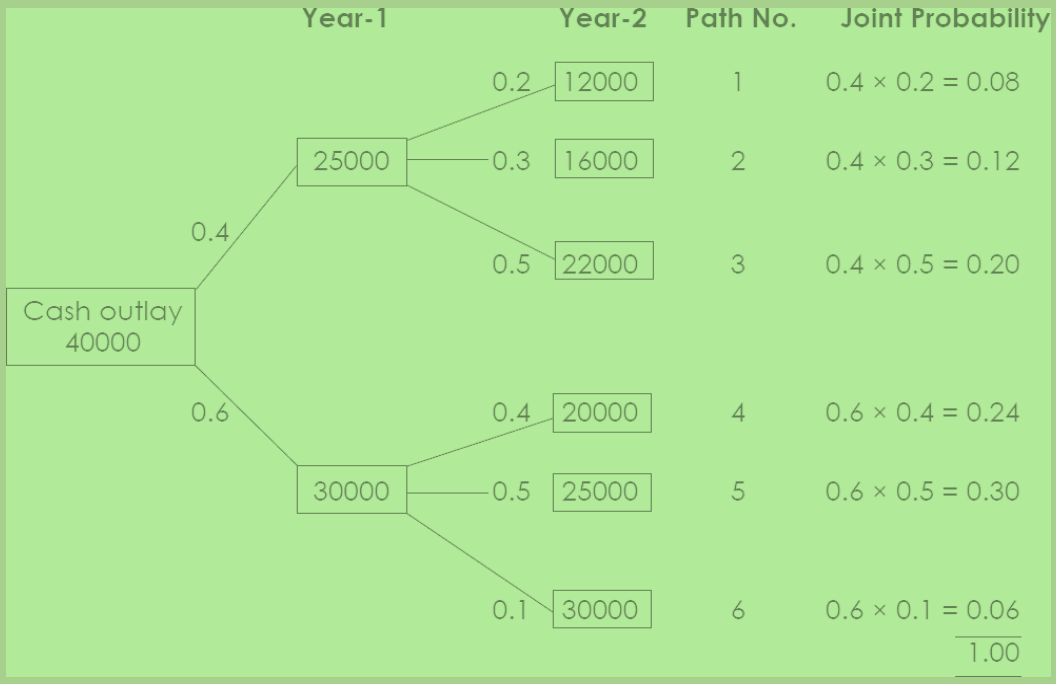
(iv) Analyse whether project be accepted. [7]

(b) 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%. Calculate the value of the stock. [7]

Answer:

(a) **Decision Tree**



(i) The decision tree given above shows that there are six possible outcomes each represented by a path. The net present value of each path at 12% discount rate is given below:

(Fig in ₹)

Path	(Cash inflow year 1 × discount factor year 1)	(Cash inflow year 2 × discount factor year 2)	Total Cash inflow	Cash outflow	Net presentvalue
	(a)	(b)	(c) = (a) + (b)	(d)	(e) = (c) – (d)
			₹	₹	₹
1	(₹25,000 × 0.8929) = 22,323	(₹12,000 × 0.7972) = 9,566	31,889	40,000	-8,111
2	(₹25,000 × 0.8929) = 22,323	(₹16,000 × 0.7972) = 12,755	35,078	40,000	-4,922
3	(₹25,000 × 0.8929) = 22,323	(₹22,000 × 0.7972) = 17,538	39,861	40,000	-139
4	(₹30,000 × 0.8929) =	(₹20,000 × 0.7972) =	42,731	40,000	2,731

	26,787	15,944			
5	(₹30,000 × 0.8929) = 26,787	(₹25,000 × 0.7972) = 19,930	46,717	40,000	6,717
6	(₹30,000 × 0.8929) = 26,787	(₹30,000 × 0.7972) = 23,916	50,703	40,000	10,703

Statement showing the expected Net Present Value

Path	Net present value @ 12% (Refer above) (₹)	Joint probability (Refer above)	Expected Net present Value (₹)
	(a)	(b)	(a) × (b)
1	- 8,111	0.08	- 648.88
2	- 4,922	0.12	- 590.64
3	-139	0.20	-27.80
4	2,731	0.24	655.44
5	6,717	0.30	2,015.10
6	10,703	0.06	642.18
			2,045.40

(ii) If the worst outcome is realized the Net present value which the project will yield is ₹8,111 (negative). The probability of occurrence of this Net present value is 8%.

(iii) The best outcome will be path 6 when Net present value is higher i.e., ₹10,703 (positive). The probability of occurrence of this Net present value is 6%.

(iv) Yes, the project will be accepted since the Expected Net Present Value is positive.

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

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.

Step 1 :- $$\sum_{t=1}^{A} \frac{D_0(1+g_a)^t}{(1+k)^t}$$

$$= \frac{2}{(1.14)} + \frac{2(1.1)}{(1.14)^2} + \frac{2(1.1)^2}{(1.14)^3} + \frac{2(1.1)^3}{(1.14)^4}$$

= 1.754 + 1.693 + 1.633 +1.576

= ₹ 6.656

Step 2:- $\sum_{t=A+1}^{B} \frac{D_{t-1}(1+g_b)}{(1+k)^t}$

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

= ₹ 4.27

Step 3 :- $\frac{D_B(1+g_n)}{k-g_n(1+k)^B}$

$= \frac{2(1.1)^3(1.09)(1.08)(1.07)(1.06)}{(0.14-0.06)\times 2.5023}$

= 17.761

Step 4 :- Add all the above components

= ₹ (6.66+4.27+17.76)

= ₹ 28.69

The present value of the stock is ₹28.69

4. (a) Akai Ltd.'s latest annual dividend of ₹1.25 a share was paid yesterday and maintained its historic 7% annual rate of growth. You plan to purchase the stock today because you believe that the dividend growth rate will increase to 8% for the next three years and the selling price of the stock will be ₹40.00 per share at the end of that time.

(i) Calculate how much should you be willing to pay for the share if you require a 12% return?

(ii) Compute the maximum price you should be willing to pay for the stock if you believe that the 8% growth rate can be maintained indefinitely and you require a 12% return?

(iii) If the 8% rate of growth is achieved, compute what will be the price at the end of year 3, assuming the conditions in part (ii)? [7]

(b) Mr. Z has invested in the three mutual funds as per the following details:

Particulars	MF X	MF Y	MF Z
Amount of investment	2,00,000	4,00,000	2,00,000
Net assets value (NAV) at the time of purchase (₹)	10.30	10.10	10.00
Dividend received up to 31/03/2023	6000	Nil	5000
NAV as on 31/03/2023	10.25	10.00	10.20
Effective yield p.a. as on 31/03/2023	9.66	-11.66	24.15

Assume 1 year =365 days

Mr. Z has misplaced the documents of his investment. Help him in computing the original investment after ascertaining the following:

(i) Numbers of units in each scheme,

(ii) Total net assets value,

(iii) Total yield,

(iv) Number of days of investment held. **[7]**

Answer:

(a) (i) Projected dividends for next 3 years:

Year 1 (₹1.25 × 1.08) = ₹1.35

Year 2 (₹1.35 × 1.08) = ₹1.46

Year 3 (₹1.46 × 1.08) = ₹1.58

Required rate of return =12%

Growth rate of dividends = 8%

The present value of stock is:

$$V = \frac{1.35}{1.12} + \frac{1.46}{(1.12)^2} + \frac{1.58}{(1.12)^3} + \frac{40}{(1.12)^3}$$

= 1.21 + 1.16 + 1.12 + 28.47 = ₹31.96

(ii) Growth rate = 8%

Required rate of return = 12%

$$V = \frac{1.35}{0.12 - 0.08}$$

= ₹33.75

(iii) Assuming all the above assumptions remain the same, the price at the end of year 3 will be:

$$P_3 = \frac{D_4}{k - g}$$

$$= \frac{1.25 \times (1.08)^4}{0.12 - 0.08}$$

= ₹42.52

(b) (i) Number of units in each scheme

MF X = 200000/10.30 = 19417.48

MF Y = 400000/10.10 = 39603.96

MF Z = 200000/10 = 20000.00

(ii) Total NAV as on 31/03/2023

MF X----------→ 19,417.48 x ₹ 10.25 = ₹ 1,99,029.17

MF Y----------→ 39,603.96 x ₹ 10.00 = ₹ 3,96,039.60

MF Z----------→ 20,000.00 x ₹10.20 = ₹ 2,04,000.0

Total = ₹7,99,068.77

(iii) Total yield

Name of Mutual Funds	Capital Yield	Dividend Yield	Total
MF X	₹1,99,029.17 - ₹2,00,000 = ₹ 970.83	₹ 6,000	₹5029.17
MF Y	₹3,96,039.60 - ₹4,00,000 = ₹ 3960.40	NIL	- ₹3960.40
MF Z	₹ 2,04,000 - ₹2,00,000= ₹ 4000	₹ 5,000	₹ 9,000
Total			₹10,068.00

Total Yield = 10068.00/800000×100 = 1.2568%

(iv) No. of days' investment was held

Particulars	MF X	MF Y	MF Z
Let number of days will be	X	Y	Z
Initial investment	2,00,000	4,00,000	2,00,000
Yield (₹)	5029.17	-3960.40	9000
Yield (%)	2.5146	-0.9901	4.5
Period of holding (days)	2.5146/9.66×365 =95 days	-0.9901/-11.66×365 =31 days	4.5/24.15×365 =68 days
Date of original investment	26.12.22	28.02.23	22.01.23

5. (a) From the following information, ascertain the Market Price of Risk of the Portfolio:

R_m	σ_m	R_f	σ_p
18%	6%	6%	8%
20%	8%	7%	4%
22%	9%	8%	12%

Also, determine the expected return for each of the above cases. **[7]**

(b) An investor is interested to construct a portfolio of securities M and N. He has collected the following information about the proposed investment:

	M	N
Expected return	20%	25%
σ	12%	16%

Co-efficient of Correlation (r) between M and N is 16. He wants to constitute only five portfolios of M and N as follows:

(i) All funds invested in M
(ii) 50% of funds in M and 50% in N.
(iii) 75% of funds in M and 25% in N.
(iv) 25% of funds in M and 75% in N.
(v) All funds invested in N.

You are required to calculate:

I. Expected return under different portfolios.
II. Risk factor associated with these portfolios.
III. Which portfolio is best from the view-point of risk?
IV. Which portfolio is best from the view-point of return? **[7]**

Answer:

(a) Formulae for Expected Return and Market Price of Risk

Expected Return on Portfolio $R_p = R_f + (\lambda \times \sigma_p)$

Market Price of Risk of Portfolio $\lambda = R_m - R_f / \sigma_m$

Expected Return and Market Price of Risk

R_m	(σ_m)	R_f	(σ_p)	$\lambda = R_m - R_f / \sigma_m$	$(R) = [R_f + \lambda \times \sigma_P]$
(1)	(2)	(3)	(4)	(5) = [(1)-(3)/(2)]	(6) = [(3)+(5)×(4)]
18%	6%	6%	8%	(18-6)/6=2	[6%+2×8%] =22.00%
20%	8%	7%	4%	(20-7)/8=1.625	[7%+1.625 × 4%] = 13.50%
22%	9%	8%	12%	(22-8)/9=1.556	[8%+1.556 ×12%] =26.67%

(b) I. Expected Return under different Portfolios

Portfolio	M		N		Expected Return of Portfolio
	Probability	Return	Probability	Return	
(i)	1	0.20	0	0.25	1 × 0.20 + 0 × 0.25 = 20%
(ii)	0.5	0.20	0.5	0.25	0.5 × 0.20 + 0.5 × 0.25 = 22.50%
(iii)	0.75	0.20	0.25	0.25	0.75 × 0.20 + 0.25 × 0.25 = 21.25%
(iv)	0.25	0.20	0.75	0.25	0.25 × 0.20 + 0.75 × 0.25 = 23.75%
(v)	0	0.20	1	0.25	0 × 0.20 +1 × 0.25 = 25%

II. Risk factor associated with different Portfolios:

Portfolio	Computation	σ_p
(i)	$= \sqrt{(\sigma_M^2 \times W_M^2) + (\sigma_N^2 \times W_N^2) + 2(\sigma_M \times W_M) \times (\sigma_N \times W_N \times \rho_{MN})}$ $= \sqrt{(12^2 \times 1^2) + (16^2 \times 0^2) + (2 \times 12 \times 1 \times 16 \times 0 \times 0.16)}$ $= \sqrt{144}$ $= 12\%$	12%
(ii)	$= \sqrt{(\sigma_M^2 \times W_M^2) + (\sigma_N^2 \times W_N^2) + 2(\sigma_M \times W_M) \times (\sigma_N \times W_N \times \rho_{MN})}$ $= \sqrt{(12^2 \times 0.50^2) + (16^2 \times 0.50^2) + (2 \times 12 \times 0.50 \times 16 \times 0.50 \times 0.16)}$ $= \sqrt{115.36}$	10.74%

	=10.74%	
(iii)	$=\sqrt{(\sigma_M^2 \times W_M^2) + (\sigma_N^2 \times W_N^2) + 2(\sigma_M \times W_M) \times (\sigma_N \times W_N \times \rho_{MN})}$ $= \sqrt{(12^2 \times 0.75^2) + (16^2 \times 0.25^2) + (2 \times 12 \times 0.75 \times 16 \times 0.25 \times 0.16)}$ $= \sqrt{108.52}$ 10.42%	10.42%
(iv)	$=\sqrt{(\sigma_M^2 \times W_M^2) + (\sigma_N^2 \times W_N^2) + 2(\sigma_M \times W_M) \times (\sigma_N \times W_N \times \rho_{MN})}$ $= \sqrt{(12^2 \times 0.25^2) + (16^2 \times 0.75^2) + (2 \times 12 \times 0.25 \times 16 \times 0.75 \times 0.16)}$ $=\sqrt{164.52}$ =12.83%	12.83%
(v)	$= \sqrt{(\sigma_M^2 \times W_M^2) + (\sigma_N^2 \times W_N^2) + 2(\sigma_M \times W_M) \times (\sigma_N \times W_N \times \rho_{MN})}$ $=\sqrt{(12^2 \times 0^2) + (16^2 \times 1^2) + (2 \times 12 \times 0 \times 16 \times 1 \times 0.16)}$ $= \sqrt{256}$ = 16%	16%

III. Best Portfolio from the point of view of risk:

The Best Portfolio from the point of view of risk is the one which has the least risk factor i.e., 10.42%. Portfolio (iii) [i.e., 75% of funds invested in M and 25% in N].

IV. Best Portfolio from the point of return:

Portfolio (v) [i.e., 100% funds invested in the security, N] is the best from the point of return. This Portfolio will earn a return of 25%.

6. (a) A portfolio manager owns 3 stocks :

Stock	Share owned	Stock Price (₹)	Beta
1	2 Lakh	800	1.1
2	4 Lakh	600	1.2
3	6 Lakh	200	1.3

The spot Nifty Index is at ₹2,700 and futures price is ₹2,704. Use stock index future to analyse the following situation -

(i) decrease the portfolio beta to 0.8 and

(ii) Increase the portfolio beta to 1.5. Assume the index factor is ₹100. Compute the number of contracts to be bought or sold of stock index futures [7]

(b) Given the following:

	Amount (₹)
Strike price	200

Current stock price	**185**
Risk free rate of interest	**5% p.a.**

i. Calculate the theoretical minimum price of a European put option after 6 months.
ii. If European put option price is ₹5, then analyse how can an arbitrageur make profit.
[7]

Answer:

(a) Computation of existing Portfolio Beta:

Security	MV of Security	Proportion	Beta of security	Weighted Beta
1	1600	4/13	1.1	0.34
2	2400	6/13	1.2	0.55
3	1200	3/13	1.3	0.30
	5200			1.19

Value per Futures Contract
= Index Price per unit × Lot Size per Futures Contract
= ₹2700 × 100 = ₹2,70,000

(i) Activity to reduce portfolio beta to 0.8
- Object: Reduce Portfolio Beta
- Activity: Sell Index Futures

Beta of Existing Portfolio = $\beta_1 = 1.19$
Desired Beta of New Portfolio = $\beta_N = 0.8$
Contract size = 100 units
Value per Futures Contract = ₹2,70,000 [V_F]
Value of Portfolio = ₹5200 Lakhs [V_P]
No of future Contract to be sold :

= Portfolio value × [Beta of Portfolio – Desired value of Beta] / Value of Future Contract

$$= V_P \times \frac{\beta_1 - \beta_N}{V_F}$$

= ₹5200 Lakhs × [(1.19 – 0.8) ÷ ₹2,70,000] = 751 Contracts

(ii) Objective to increase portfolio beta to 1.5
- Object: Increase Portfolio Beta
- Activity: Buy Index Futures

Beta of Existing Portfolio = $\beta_1 = 1.19$
Desired Beta of New Portfolio = $\beta_n = 1.5$
Value per Futures Contract = ₹2,70,000 [V_F]
Value of Portfolio = ₹5200 Lakhs [V_P]
No of future Contract to be bought :

= Portfolio value × [Desired value of Beta – Beta of the Portfolio] / Value of Future Contract

$$= V_P \times \frac{\beta_1 - \beta_N}{V_F}$$

= ₹5200 Lakhs × [(1.50 – 1.19) ÷ ₹270000] = 597 Contracts

(b) (i) Computation of Theoretical Minimum Price

Particulars	Value
Exercise price	₹200
Current Stock Price	₹185
Risk Free Rate of Return (r)	5% or 0.05
Time (in years)	6 ÷ 12 = 0.5
Theoretical Minimum Price	= Present Value of Exercise Price - Current Stock Price = 200 × e^{-rt} - 185 = 200 × $e^{-0.05\times0.5}$ - 185 = 200 × 0.9753 -185 = 195.0612 - 185 = 10.0612

Inference: Since the Value of Put Option is more than the price of the Put Option, it is under priced and the recommended action will be to Buy the Put Option.

(ii) Cash Flows to make Profit for the Arbitrageur Activity Flow:

- Arbitrageur can borrow the amount required to buy the Put Option and Stock at the rate of 5% p.a. for 6 months.
- Buy Put Option.
- Take the opposite position and buy stock at spot price.
- At the end of six months, exercise the Put option and realise the receipts.
- Pay the amount of Borrowing together with Interest.

Particulars	Time	₹
1. Borrow at the rate of 5% for 6 months [185+5]	T_0	190
2. Buy Put Option	T_0	(5)
3. Buy Stock at Spot Price	T_0	(185)
4. Exercise the Put Option and realise the Sale Proceeds	T_1	200
5. Repay the amount of Borrowing together with Interest [190 × $e^{0.05\times0.5}$] = [190 × 1.02532]	T_1	194.81
6. Net Gain made [(4) – (5)]	T_1	5.19

Note: The amount of gain is the minimum amount and will Increase with every Increase in Spot Price as on the Exercise Date.

7. (a) A firm is contemplating import of a consignment from USA for a value of USD 10,000. It requires 90 days to make payment. Supplier has offered 60 days' interest–free credit and is willing to offer additional 30 days' credit at an interest rate of 6% per annum. (Consider 360 days p.a.)

The Bankers of the firm offer a 30 days loan at 9 % per annum and its quotes for foreign exchange are as follows:

Spot 1 USD = ₹ 46.00,

60 days forward rate for 1 USD = ₹ 46.20,

90 days forward rate for 1 USD = ₹ 46.35.

You are required to advice the firm as to whether it should—

(i) Pay the supplier in 60 days or

(ii) Avail the suppliers offer of 90 days' credit. [7]

(b) Exchange rate between Rupee and Swiss franc is ₹33/SFr at the reference period and the forward rate is found to be ₹33.40/SFr after 9 months. Nine-month interest rate on Rupee is 8% p.a. Recommend what should have been corresponding interest rate on Swiss franc. Justify that interest rate differential is equal to forward premium or discount. [7]

Answer:

(a) Cash Outflows under the two options are—

(i) Payment to supplier in 60 days

If the payment is made to supplier in 60 Days, the applicableforward rate for 1 US$	₹46.20
Payment due	US$ 10,000
Outflow in rupees (US$ 10,000 × ₹ 46.20)	₹4,62,000
Add: Interest on Loan for 30 days @9% p.a.	₹3,465
Total Outflow	₹4,65,465

(ii) Payment to supplier in 90 days

Amount Payable	US$ 10,000
Add: Interest on Credit Period for 30 days @ 6% p.a.	US$ 50
Total Outflow in US$	US$ 10,050
Applicable forward for 1 US$	₹46.35
Total Outflow (US$ 10,050× ₹ 46.35)	₹4,65,818

It is better to select alternative (i) as entails lower cash flows.

(b) Given, e_0 = ₹33/SFr

f_1 = ₹33.40/SFr

Interest rate in home country (India) = r_h = 8% p.a. (for 9 months)

Interest rate in foreign country (USA) = r_f = x% p.a. (for 9 months)

Since, as per IPR, $= f_1 = e_0 \times (1+ r_h)/1+ r_f$

Conditionally, $33.40 = 33\times\frac{1+0.08\times9/12}{1+X\times9/12}$

or, x = 0.063 or 6.3%

So, the interest rate on Swiss franc is 6.3% p.a.

Interest rate differential = $r_h - r_f / 1 + r_f$

$$= \frac{0.08 \times 9/12 - 0.063 \times 9/12}{1 + 0.063 \times 9/12}$$

$$= 1.21\%$$

Forward premium or discount = $f_1 - e_0 / e_0$

$$= (33.40 - 33.00) / 33.00$$

$$= 1.21\%$$

So, interest rate differential is equal to forward premium or discount.

8. Short Notes on:

(a) Analyse Stable-coins and discuss their uses. **[5]**

(b) Discuss the different types of foreign bonds. **[5]**

(c) Discuss the objectives of Cross Border Leasing. **[4]**

Answer:

(a) Concept of Stablecoin:

A Stablecoin is a cryptocurrency which is pegged to any reserve asset like a fiat currency, commodity, or other cryptocurrencies. It is a tokenized version of the asset and can be introduced subtly into a blockchain ecosystem to facilitate seamless pass transactions, improved arbitrage, and exchange of value. Many a times it is referred to as a utility token because it allows you to quickly buy and sell on decentralized exchanges that do not accept fiat currencies. However, these can also be used in centralized exchanges and reduce the processing time.

Uses of Stablecoin:

(i) Stablecoin can be used as an everyday currency. Unlike traditional crypto coins, which are subject to high degree of price fluctuations and volatility, stablecoins do not fluctuate rapidly because they are backed by national currencies, commodities etc.

(ii) Stablecoins also have a great potential for smart contracts. Smart contracts are frequently based on other cryptocurrencies, such as Ethereum. Frequent price changes of cryptocurrencies can have an unpredictable impact on the contract's terms. Therefore, the use of stablecoins like Tether can provide contract stability to both parties, by reducing market volatility and ensuring more secure contracts enforced by the blockchain.

(b) Different types of foreign bonds are as follows:

- Yankee Bonds: These are US dollar denominated issues by foreign borrowers (usually foreign governments or entities, supranational and highly rated corporate borrowers) in the US bond markets. Reliance Industries Ltd. has been the most successful corporate to tap this instrument with a 50-year, $50 million Yankee Bond issue in 2013.

- Samurai Bonds: These are bonds issued by non-Japanese borrowers in the domestic Japanese markets. Borrowers are supranational and have at least a minimum investment grade rating (A rated). The maturities range between 3-20 years.
- Bulldog Bonds: These are sterling denominated foreign bonds which are raised in the UK domestic securities market. The maturity of these bonds will be either for very short periods (5 years) or for very long maturities (25 years and above). Bonds with intermediate maturity periods are rare. These bulldog bonds are generally subscribed by long-term institutional investors like pension funds and life insurance companies.
- Shibosai Bonds: These are the privately placed bonds issued in the Japanese markets. The qualifying criteria is less stringent as compared to Samurai or EuroYen bonds. Shibosai bonds are offered to a different market segment that consists of institutional investors, including banks.

(c) Objectives of Cross Border Leasing:

- Overall Cost of Financing: A major objective of cross-border leases is to reduce the overall cost of financing through utilization of tax depreciation allowances by the lessor in order to reduce its taxable income. The tax savings are passed through to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor's country, liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership.
- Security: The lessor is often able to utilize non-recourse debt to finance a substantial portion of the equipment cost. The debt is secured, among other things, by a mortgage on the equipment and by an assignment of the right to receive payments under the lease.
- Accounting Treatment: Depending on the structure, in some countries, the lessor can utilize very favourable "Leveraged Lease" Financial Accounting treatment for the overall transaction.
- Repossession: In some countries, it is easier for a lessor to repossess the leased equipment following a default by Lessee because the lessor is an owner and not a mere secured lender.