

PAPER – 2 : STRATEGIC FINANCIAL MANAGEMENT

Answers all the Questions

Question 1

- (a) Following information is available for X Company's shares and Call option:

Current share price	Rs.185
Option exercise price	Rs.170
Risk free interest rate	7%
Time of the expiry of option	3 years
Standard deviation	0.18

Calculate the value of option using Black-Scholes formula. (12 Marks)

- (b) Suppose a dealer quotes 'All-in-cost' for a generic swap at 8% against six month libor flat. If the notional principal amount of swap is Rs.5,00,000,

- (i) Calculate semi-annual fixed payment.
- (ii) Find the first floating rate payment for (i) above if the six month period from the effective date of swap to the settlement date comprises 181 days and that the corresponding libor was 6% on the effective date of swap.

In (ii) above, if the settlement is on 'Net' basis, how much the fixed rate payer would pay to the floating rate payer?

Generic swap is based on 30/360 days basis. (3 Marks)

- (c) Consider the following information on two stocks, A and B :

Year	Return on A (%)	Return on B (%)
2006	10	12
2007	16	18

You are required to determine:

- (i) The expected return on a portfolio containing A and B in the proportion of 40% and 60% respectively.
- (ii) The Standard deviation of return from each of the two stocks.
- (iii) The covariance of returns from the two stocks.
- (iv) Correlation coefficient between the returns of the two stocks.
- (v) The risk of a portfolio containing A and B in the proportion of 40% and 60%.

(5 Marks)

Answer

$$\begin{aligned}
 (a) \quad d_1 &= \frac{\ln S/E + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}} \\
 &= \frac{\ln (185/170) + (0.07 + \frac{0.18^2}{2}) 3}{0.18\sqrt{3}} \\
 &= \frac{\ln 1.0882 + (0.07 + 0.0162) 3}{0.18\sqrt{3}} \\
 &= \frac{0.08455 + 0.2586}{0.18\sqrt{3}} \\
 &= \frac{0.34315}{0.31177}
 \end{aligned}$$

$$d_1 = 1.1006$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

$$= 1.1006 - 0.31177 = 0.7888$$

$$N(d_1) = 0.8770 \text{ (from table)}$$

$$N(d_2) = 0.7848$$

Working Note

$$\begin{aligned}
 N(d_2) &= 0.7823 + 0.88 \times (7852 - 7823) \\
 &= 0.7848
 \end{aligned}$$

$$\begin{aligned}
 \text{Value of option} &= V_s (Nd_1) - \frac{E}{e^{rt}} (Nd_2) \\
 &= 185 (0.8770) - \frac{170}{e^{0.21}} (0.7848) \\
 &= 162.245 - \frac{170}{1.2336} \times 0.7848 \\
 &= 162.245 - 108.151 \\
 &= \text{Rs.} 54.094
 \end{aligned}$$

(b) (i) Semi-annual fixed payment

$$= (N) (AIC) (\text{Period})$$

Where N = Notional Principal amount = Rs.5,00,000

$$\text{AIC} = \text{All-in-cost} = 8\% = 0.08$$

$$= 5,00,000 \times 0.08 \left(\frac{180}{360} \right)$$

$$= 5,00,000 \times 0.08 (0.5)$$

$$= 5,00,000 \times 0.04$$

$$= \text{Rs.}20,000/-$$

(ii) Floating Rate Payment

$$= N (\text{LIBOR}) \left(\frac{dt}{360} \right)$$

$$= 5,00,000 \times 0.06 \times \frac{181}{360}$$

$$= 5,00,000 \times 0.06 (0.503) \text{ or } 5,00,000 \times 0.06 (0.502777)$$

$$= 5,00,000 \times 0.03018 \text{ or } 0.30166$$

$$= \text{Rs.}15090 \text{ or } 15083$$

Both are correct

(iii) Net Amount

$$= (i) - (ii)$$

$$= \text{Rs.}20,000 - 15090 = 4910$$

$$\text{or } = \text{Rs.}20,000 - 15083 = 4917$$

(c) (i) Expected return of the portfolio A and B

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

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

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

(ii) Stock A:

$$\text{Variance} = 0.5 (10 - 13)^2 + 0.5 (16 - 13)^2 = 9$$

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

Stock B:

$$\text{Variance} = 0.5 (12 - 15)^2 + 0.5 (18 - 15)^2 = 9$$

$$\text{Standard deviation} = 3\%$$

(iii) Covariance of stocks A and B

$$\text{Cov}_{AB} = 0.5 (10 - 13) (12 - 15) + 0.5 (16 - 13) (18 - 15) = 9$$

(iv) Correlation of coefficient

$$r_{AB} = \frac{\text{Cov}_{AB}}{\sigma_A \sigma_B} = \frac{9}{3 \times 3} = 1$$

(v) Portfolio Risk

$$\begin{aligned} \sigma_P &= \sqrt{X_A^2 \sigma_A^2 + X_B^2 \sigma_B^2 + 2X_A X_B (\sigma_A \sigma_B \sigma_{AB})} \\ &= \sqrt{(0.4)^2 (3)^2 + (0.6)^2 (3)^2 + 2 (0.4) (0.6) (3) (3) (1)} \\ &= \sqrt{1.44 + 3.24 + 4.32} = 3\% \end{aligned}$$

Question 2

(a) The following is the Yield structure of AAA rated debenture:

Period	Yield (%)
3 months	8.5%
6 months	9.25
1 year	10.50
2 years	11.25
3 years and above	12.00

- Based on the expectation theory calculate the implicit one-year forward rates in year 2 and year 3.
- If the interest rate increases by 50 basis points, what will be the percentage change in the price of the bond having a maturity of 5 years? Assume that the bond is fairly priced at the moment at Rs.1,000. (4 Marks)

(b) RST Ltd. has a capital of Rs.10,00,000 in equity shares of Rs.100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs.10 per share at the end of the current financial year. The capitalization rate for the risk class of which the company belongs is 12%. What will be the market price of the share at the end of the year, if

- a dividend is not cleared ?
- a dividend is declared ?

- (iii) assuming that the company pays the dividend and has net profits of Rs.5,00,000 and makes new investments of Rs.10,00,000 during the period, how many new shares must be issued? Use the MM model. (4 Marks)
- (c) Mr. X established the following spread on the Delta Corporation's stock :
- (i) Purchased one 3-month call option with a premium of Rs.30 and an exercise price of Rs.550.
 - (ii) Purchased one 3-month put option with a premium of Rs.5 and an exercise price of Rs.450.

Delta Corporation's stock is currently selling at Rs.500. Determine profit or loss, if the price of Delta Corporation's :

- (i) remains at Rs.500 after 3 months.
- (ii) falls at Rs.350 after 3 months.
- (iii) rises to Rs.600.

Assume the size option is 100 shares of Delta Corporation. (6 Marks)

- (d) XL Ispat Ltd. has made an issue of 14 per cent non-convertible debentures on January 1, 2007. These debentures have a face value of Rs.100 and is currently traded in the market at a price of Rs.90.

Interest on these NCDs will be paid through post-dated cheques dated June 30 and December 31. Interest payments for the first 3 years will be paid in advance through post-dated cheques while for the last 2 years post-dated cheques will be issued at the third year. The bond is redeemable at par on December 31, 2011 at the end of 5 years.

Required :

- (i) Estimate the current yield at the YTM of the bond.
- (ii) Calculate the duration of the NCD.
- (iii) Assuming that intermediate coupon payments are, not available for reinvestment calculate the realised yield on the NCD. (6 Marks)

Answer

- (a) (i) Implicit rates for year 2 and year 3

$$\begin{aligned}
 \text{For year 2} \quad f_2 &= \frac{(1+r_2)^2}{1+r_1} - 1 \\
 &= \frac{(1.1125)^2}{(1.1050)} - 1 = 12\%
 \end{aligned}$$

$$\begin{aligned}\text{For year 3 } f_3 &= \frac{(1+r_3)^3}{(1+r_1)(1+f_2)} - 1 \\ &= \frac{(1.12)^3}{(1.1050)(1.12)} - 1 = \frac{1.404928}{1.2376} - 1 = 13.52\%\end{aligned}$$

- (ii) If fairly priced at Rs.1000 and rate of interest increases to 12.5% the percentage charge will be as follows:

$$\begin{aligned}\text{Price} &= \frac{1000(1.12)^5}{(1.125)^5} = \frac{1762.34168}{1.8020} \\ &= 977.99 \text{ or Rs. } 987 \\ \% \text{ charge} &= \frac{1000 - 978}{1000} \times 100 = \frac{22}{1000} \times 100 \\ &= 2.2\%\end{aligned}$$

- (b) As per MM model, the current market price of equity share is:

$$P_0 = \frac{1}{1+k_e} \times (D_1 + P_1)$$

- (i) If the dividend is not declared :

$$100 = \frac{1}{1+0.12} (0 + P_1)$$

$$100 = \frac{P_1}{1.12}$$

$$P_1 = \text{Rs.}112$$

The Market price of the equity share at the end of the year would be Rs.112.

- (ii) If the dividend is declared :

$$100 = \frac{1}{1+0.12} \times (10 + P_1)$$

$$100 = \frac{10 + P_1}{1.12}$$

$$112 = 10 + P_1$$

$$P_1 = 112 - 10 = \text{Rs.}102$$

The market price of the equity share at the end of the year would be Rs.102.

- (iii) In case the firm pays dividend of Rs.10 per share out of total profits of Rs.5,00,000 and plans to make new investment of RS.10,00,000, the number of shares to be issued may be found as follows:

Total Earnings	Rs.5,00,000
- Dividends paid	<u>1,00,000</u>
Retained earnings	4,00,000
Total funds required	10,00,000
Fresh funds to be raised	6,00,000
Market price of the share	102
Number of shares to be issued (Rs.6,00,000 / 102)	5,882.35

or, the firm would issue 5,883 shares at the rate of Rs.102

- (c) (i) Total premium paid on purchasing a call and put option

$$= (\text{Rs.30 per share} \times 100) + (\text{Rs.5 per share} \times 100).$$

$$= 3,000 + 500 = \text{Rs.3,500}$$

In this case, X exercises neither the call option nor the put option as both will result in a loss for him.

$$\text{Ending value} = - \text{Rs.3,500} + \text{zero gain}$$

$$= - \text{Rs.3,500}$$

$$\text{i.e Net loss} = \text{Rs.3,500}$$

- (ii) Since the price of the stock is below the exercise price of the call, the call will not be exercised. Only put is valuable and is exercised.

$$\text{Total premium paid} = \text{Rs.3,500}$$

$$\text{Ending value} = - \text{Rs.3,500} + \text{Rs.}[(450 - 350) \times 100]$$

$$= - \text{Rs.3,500} + \text{Rs.10,000} = \text{Rs.6,500}$$

$$\therefore \text{Net gain} = \text{Rs.6,500}$$

- (iii) In this situation, the put is worthless, since the price of the stock exceeds the put's exercise price. Only call option is valuable and is exercised.

$$\text{Total premium paid} = \text{Rs.3,500}$$

$$\text{Ending value} = -3,500 + [(600 - 550) \times 100]$$

$$\text{Net Gain} = -3,500 + 5,000 = \text{Rs.1,500}$$

(d) (i) Current yield = $\frac{14}{90} = 0.1555$ or 15.55%

YTM can be determined from the following equation

$$14 \times PVIFA(YTM, 5) + 100 \times PVIF(YTM, 5) = 90$$

$$YTM = 17.14\%$$

(ii) The duration can be calculated as follows:

Year	Cash Flow	PV at 17.14%	Proportion of NCD value	Proportion of NCD value × time
1	14	11.952	0.1328	0.1328
2	14	10.203	0.1134	0.2268
3	14	8.710	0.0968	0.2904
4	14	7.435	0.0826	0.3304
5	114	<u>51.685</u>	0.5744	<u>2.8720</u>
		89.985		3.8524

$$\text{Duration} = 3.8524 \text{ years.}$$

(iii) Realized Yield can be calculated as follows:

$$\frac{(14 \times 5) + 100}{(1 + R)^5} = 90$$

$$(1 + R)^5 = \frac{170}{90}$$

$$R = \left(\frac{170}{90} \right)^{1/5} - 1 = 0.1356 \text{ or } 13.56\%$$

Question 3

(a) A company has an old machine having book value zero – which can be sold for Rs.50,000. The company is thinking to choose one from following two alternatives:

- (i) To incur additional cost of Rs.10,00,000 to upgrade the old existing machine.
- (ii) To replace old machine with a new machine costing Rs.20,00,000 plus installation cost Rs.50,000.

Both above proposals envisage useful life to be five years with salvage value to be nil.

The expected after tax profits for the above three alternatives are as under :

Year	Old existing Machine (Rs.)	Upgraded Machine (Rs.)	New Machine (Rs.)
1.	5,00,000	5,50,000	6,00,000
2.	5,40,000	5,90,000	6,40,000
3.	5,80,000	6,10,000	6,90,000

4.	6,20,000	6,50,000	7,40,000
5.	6,60,000	7,00,000	8,00,000

The tax rate is 40 per cent.

The company follows straight line method of depreciation. Assume cost of capital to be 15 per cent.

P.V.F. of 15%, 5 = 0.870, 0.756, 0.658, 0.572 and 0.497. You are required to advise the company as to which alternative is to be adopted. (8 Marks)

(b) The data given below relates to a convertible bond :

Face value	Rs.250
Coupon rate	12%
No. of shares per bond	20
Market price of share	Rs.12
Straight value of bond	Rs.235
Market price of convertible bond	Rs.265

Calculate :

- (i) Stock value of bond.
- (ii) The percentage of downside risk.
- (iii) The conversion premium
- (iv) The conversion parity price of the stock. (8 Marks)

(c) What are the drawbacks of investments in Mutual Funds ? (4 Marks)

Answer

(a) (A) Cash Outflow

(i) In case machine is upgraded:	
up gradation cost	<u>Rs.10,00,000</u>
(ii) In case new machine installed:	
Cost	Rs.20,00,000
Add: Installation cost	<u>Rs. 50,000</u>
Total Cost	Rs.20,50,000
Less: Disposal of old machine	
Rs..50,000 – 40% tax	<u>Rs. 30,000</u>
Total Cash Outflow	Rs.20,20,000

Working Note:

- (i) Depreciation – in case machine is upgraded
 $\text{Rs.}10,00,000 \div 5 = \text{Rs.}2,00,000$
- (ii) Depreciation – in case new machine is installed
 $\text{Rs.}20,50,000 \div 5 = \text{Rs.}4,10,000$
- (iii) Old existing machine – Book Value is zero. So no depreciation.

(B) Cash Inflows after Taxes (CFAT)

Year	Old Existing Machine		Upgraded Machine		
	(i) EAT/CFAT Rs.	(ii) EAT Rs.	(iii) DEP Rs.	(iv) CFAT Rs.	= (iv)-(i) Incremental CFAT (Rs.)
1	5,00,000	5,50,000	2,00,000	7,50,000	2,50,000
2	5,40,000	5,90,000	2,00,000	7,90,000	2,50,000
3	5,80,000	6,10,000	2,00,000	8,10,000	2,30,000
4	6,20,000	6,50,000	2,00,000	8,50,000	2,30,000
5	<u>6,60,000</u>	7,00,000	2,00,000	9,00,000	2,40,000
	<u>29,00,000</u>				

Cash Inflow after Taxes (CFAT)

Year	New Machine			
	(vi) EAT Rs.	(vii) DEP Rs.	(viii) CFAT Rs.	(ix) = (viii) – (i) Incremental CFAT (Rs.)
1	6,00,000	4,10,000	10,10,000	5,10,000
2	6,40,000	4,10,000	10,50,000	5,10,000
3	6,90,000	4,10,000	11,00,000	5,20,000
4	7,40,000	4,10,000	11,50,000	5,30,000
5	<u>8,00,000</u>	4,10,000	12,10,000	5,50,000

P.V. AT 15% - 5 Years – on Incremental CFAT

Year	Upgraded Machine			New Machine		
	Incremental CFAT Rs.	PVF	Total P.V. Rs.	Incremental CFAT	PVF	Total PV Rs.
1	2,50,000	0.870	2,17,500	5,10,000	0.870	4,43,700
2	2,50,000	0.756	1,89,000	5,10,000	0.756	3,85,560
3	2,30,000	0.658	1,51,340	5,20,000	0.658	3,42,160
4	2,30,000	0.572	1,31,560	5,30,000	0.572	3,03,160
5.	2,40,000	0.497	<u>1,19,280</u>	5,50,000	0.497	<u>2,73,350</u>

Total P.V. of CFAT	<u>8,08,680</u>	<u>17,47,930</u>
Less: Cash Outflows	<u>10,00,000</u>	<u>20,20,000</u>
N.P.V. =	<u>-1,91,320</u>	<u>- 2,72,070</u>

As the NPV in both the new (alternative) proposals is negative, the company should continue with the Existing Old Machine.

- (b) (i) Stock value or conversion value of bond

$$12 \times 20 = \text{Rs.}240$$

percentage of the downside risk

$$\frac{265 - 235}{235} = 0.1277 \text{ or } 12.77\%$$

This ratio gives the percentage price decline experienced by the bond if the stock becomes worthless.

Conversion Premium

$$\frac{\text{Market Price} - \text{Conversion Value}}{\text{Conversion Value}} \times 100$$

$$\frac{265 - 240}{240} \times 100 = 10.42\%$$

Conversion Parity Price

$$\frac{\text{Bond Price}}{\text{No. of Shares on Conversion}}$$

$$\frac{265}{20} = 13.25$$

This indicates that if the price of shares rises to Rs.13.25 from Rs.12 the investor will neither gain nor lose on buying the bond and exercising it. Observe that Rs.1.25 (13.25 – 12.00) is 10.42% of Rs.12, the Conversion Premium.

- (c) DRAWBACKS OF INVESTMENT IN MUTUAL FUNDS

- There is no guarantee of return as some Mutual Funds may under perform and Mutual Fund Investment may depreciate in value which may even effect erosion / Depletion of principal amount
- Diversification may minimize risk but does not guarantee higher return.
- Mutual funds performance is judged on the basis of past performance record of various companies. But this can not take care of or guarantee future performance.
- Mutual Fund cost is involved like entry load, exit load, fees paid to Asset Management Company etc.

- (e) There may be unethical Practices e.g. diversion of Mutual Fund amounts by Mutual Fund /s to their sister concerns for making gains for them.
- (f) MFs, systems do not maintain the kind of transparency, they should maintain
- (g) Many MF scheme are, at times, subject to lock in period, therefore, deny the market drawn benefits
- (h) At times, the investments are subject to different kind of hidden costs.
- (i) Redressal of grievances, if any, is not easy

Question 4

- (a) An exporter is a UK based company. Invoice amount is \$3,50,000. Credit period is three months. Exchange rates in London are :

Spot Rate (\$/£) 1.5865 – 1.5905

3-month Forward Rate (\$/£) 1.6100 – 1.6140

Rates of interest in Money Market :

	Deposit	Loan
\$	7%	9%
£	5%	8%

Compute and show how a money market hedge can be put in place. Compare and contrast the outcome with a forward contract. (6 Marks)

- (b) An Indian exporting firm, Rohit and Bros., would be cover itself against a likely depreciation of pound sterling. The following data is given :

Receivables of Rohit and Bros : £500,000

Spot rate : Rs.56,00/£

Payment date : 3-months

3 months interest rate : India : 12 per cent per annum

: UK : 5 per cent per annum

What should the exporter do ?

(6 Marks)

- (c) The closing value of Sensex for the month of October, 2007 is given below:

Date Closing	Sensex Value
1.10.07	2800
3.10.07	2780
4.10.07	2795
5.10.07	2830

8.10.07	2760
9.10.07	2790
10.10.07	2880
11.10.07	2960
12.10.07	2990
15.10.07	3200
16.10.07	3300
17.10.07	3450
19.10.07	3360
22.10.07	3290
23.10.07	3360
24.10.07	3340
25.10.07	3290
29.10.07	3240
30.10.07	3140
31.10.07	3260

You are required to test the week form of efficient market hypothesis by applying the run test at 5% and 10% level of significance.

Following value can be used :

Value of t at 5% is 2.101 at 18 degrees of freedom

Value of t at 10% is 1.734 at 18 degrees of freedom

Value of t at 5% is 2.086 at 20 degrees of freedom.

Value of t at 10% is 1.725 at 20 degrees of freedom.

(8 Marks)

Answer

(a) Identify: Foreign currency is an asset. Amount \$ 3,50,000.

Create: \$ Liability.

Borrow: In \$. The borrowing rate is 9% per annum or 2.25% per quarter.

Amount to be borrowed: $3,50,000 / 1.0225 = \$ 3,42,298.29$

Convert: Sell \$ and buy £. The relevant rate is the Ask rate, namely, 1.5905 per £,

(Note: This is an indirect quote). Amount of £s received on conversion is 2,15,214.27 ($3,42,298.29 / 1.5905$).

Invest: £ 2,15,214.27 will be invested at 5% for 3 months to get £ 2,17,904.45

Settle: The liability of \$3,42,298.29 at interest of 2.25 per cent quarter matures to \$3,50,000 receivable from customer.

Using forward rate, amount receivable is = $3,50,000 / 1.6140 = \text{£}2,16,852.54$

Amount received through money market hedge = $\text{£}2,17,904.45$

Gain = $2,17,904.45 - 2,16,852.54 = \text{£}1,051.91$

So, money market hedge is beneficial for the exporter

- (b) The only thing lefts Rohit and Bros to cover the risk in the money market. The following steps are required to be taken:

- (i) Borrow pound sterling for 3- months. The borrowing has to be such that at the end of three months, the amount becomes $\text{£} 500,000$. Say, the amount borrowed is $\text{£} x$. Therefore

$$x \left[1 + 0.05 \times \frac{3}{12} \right] = 500,000 \text{ or } x = \text{£}493,827$$

- (ii) Convert the borrowed sum into rupees at the spot rate. This gives: $\text{Rs.}493,827 \times 56 = \text{Rs.}27,654,312$

- (iii) The sum thus obtained is placed in the money market at 12 per cent to obtain at the end of 3- months:

$$S = 27,654,312 \times \left[1 + 0.12 \times \frac{3}{12} \right] = \text{Rs.}28,483,941$$

- (iv) The sum of $\text{£}500,000$ received from the client at the end of 3- months is used to refund the loan taken earlier.

From the calculations. It is clear that the money market operation has resulted into a net gain of $\text{Rs.}483,941 (= 28,483,941 - 500.000 \times 56)$.

If pound sterling has depreciated in the meantime. The gain would be even bigger.

- (c)

Date	Closing Sensex	Sign of Price Charge
1.10.07	2800	
3.10.07	2780	-
4.10.07	2795	+
5.10.07	2830	+
8.10.07	2760	-
9.10.07	2790	+
10.10.07	2880	+
11.10.07	2960	+
12.10.07	2990	+
15.10.07	3200	+
16.10.07	3300	+
17.10.07	3450	+
19.10.07	3360	-
22.10.07	3290	-

23.10.07	3360	+
24.10.07	3340	-
25.10.07	3290	-
29.10.07	3240	-
30.10.07	3140	-
31.10.07	3260	+

Total of sign of price changes (r) = 08

No of Positive changes = $n_1 = 11$

No. of Negative changes = $n_2 = 08$

$$\mu_r = \frac{2n_1n_2}{n_1 + n_2} + 1$$

$$\mu = \frac{2 \times 11 \times 8}{11 + 8} + 1$$

$$= 176/10 + 1 = 10.26$$

$$\hat{\sigma}_r = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2(n_1 + n_2 - 1)}}$$

$$\hat{\sigma}_r = \sqrt{\frac{(2 \times 11 \times 8)(2 \times 11 \times 8 - 11 - 8)}{(11 + 8)^2(11 + 8 - 1)}}$$

$$= \sqrt{\frac{176 \times 157}{(19)^2(18)}} = \sqrt{4.252} = 2.06$$

Since too few runs in the case would indicate that the movement of prices is not random. We employ a two- tailed test the randomness of prices.

Test at 5% level of significance at t.05 using t- table at 18 degrees of freedom

The lower limit

$$= \mu - t \times \hat{\sigma}_r$$

$$= 10.26 - 2.101 \times 2.06 = 5.932$$

Upper limit

$$= \mu + t \times \hat{\sigma}_r$$

$$= 10.26 + 2.101 \times 2.06 = 14.588$$

At 10% level of significance at 18 degrees of freedom

lower limit

$$= 10.26 - 1.734 \times 2.06 = 6.688$$

Upper limit

$$= 10.26 + 1.734 \times 2.06 = 13.832$$

As seen r lies between these limits. Hence, the market exhibits weak form of efficiency

Question 5

- (a) (i) The rate of inflation in USA is likely to be 3% per annum and in India it is likely to be 6.5%. The current spot rate of US \$ in India is Rs.43.40. Find the expected rate of US \$ in India after one year and 3 years from now using purchasing power parity theory. (4 Marks)
- (ii) On April 1, 3 months interest rate in the UK £ and US \$ are 7.5% and 3.5% per annum respectively. The UK £/US \$ spot rate is 0.7570. What would be the forward rate for US \$ for delivery on 30th June ? (4 Marks)
- (b) K. Ltd. is considering acquiring N. Ltd., the following information is available :

Company	Profit after tax	Number of Equity shares	Market value per share
K. Ltd.	50,00,000	10,00,000	200.00
N. Ltd.	15,00,000	2,50,000	160.00

Exchange of equity shares for acquisition is based on current market value as above. There is no synergy advantage available :

Find the earning per share for company K. Ltd. after merger.

Find the exchange ratio so that shareholders of N. Ltd. would not be at a loss. (12 Marks)

Answer

- (a) (i) According to Purchasing Power Parity forward rate is

$$\text{Spot rate} \left[\frac{1+r_H}{1+r_F} \right]^t$$

So spot rate after one year

$$43.40 \left[\frac{1+0.065}{1+0.03} \right]^1$$

$$= 43.4 (1.03399)$$

$$= 44.8751$$

After 3 years

$$\begin{aligned}
 & 43,40 \left[\frac{1 + 0.065}{1 + 0.03} \right]^3 \\
 & = 43.40 (1.03398)^3 \\
 & = 43.40 (1.10544) \\
 & = \text{Rs.} 47.9762
 \end{aligned}$$

(ii) As per interest rate parity

$$\begin{aligned}
 S_1 &= S_0 \left[\frac{1 + \text{in A}}{1 + \text{in B}} \right] \\
 S_1 &= 0.7570 \left[\frac{1 + (0.075) \times \frac{3}{12}}{1 + (0.035) \times \frac{3}{12}} \right] \\
 &= 0.7570 \left[\frac{1.01875}{1.00875} \right] \\
 &= 0.7570 \times 1.0099 = 0.7645 \\
 S_1 &= \text{UK } \pounds 0.7645 / \text{US\$}
 \end{aligned}$$

(b) Earning per share for company K. Ltd. after Merger :

Exchange Ratio 160 : 200 = 4 : 5

That is 4 shares of K. Ltd. for every 5 shares of N. Ltd.

∴ Total number of shares to be issued =

$$\frac{4}{5} \times 2,50,000 = 2,00,000 \text{ shares}$$

∴ Total number of shares of K. Ltd. and N. Ltd.

= 10,00,000 K. Ltd.

+ 2,00,000 N. Ltd

12,00,000

Total profit after Tax = Rs. 50,00,000 K. Ltd.

Rs. 15,00,000 N Ltd.

Rs. 65,00,000

∴ E.P.S. (Earning per share) of K. Ltd. after Merger

$$= \text{Rs. } \frac{65,00,000}{12,00,000} = \text{Rs.} 5.42 \text{ Per Share}$$

- (ii) To find the Exchange Ratio so that shareholders of N. Ltd. would not be at a Loss:

Present Earnings per share for company K. Ltd.

$$= \frac{\text{Rs.}50,00,000}{\text{Rs.}10,00,000} = \text{Rs.}5.00$$

Present Earnings Per share for company N. Ltd.

$$= \frac{\text{Rs.}15,00,000}{\text{Rs.}2,50,000} = \text{Rs.}6.00$$

∴ Exchange Ratio should be 6 shares of K. Ltd. for every 5 shares of N Ltd.

∴ Shares to be issued to N. Ltd.

$$= \frac{2,50,000 \times 6}{5} = 3,00,000 \text{ Shares}$$

∴ Total No. of Shares of K.Ltd. and N. Ltd.

$$\begin{array}{rcl} = & 10,00,000 & \text{K. Ltd.} \\ & + \quad \underline{3,00,000} & \text{N. Ltd} \\ & \underline{13,00,000} & \end{array}$$

$$\therefore \text{E.P.S. After Merger} \frac{65,00,000}{13,00,000} = \text{Rs.}5.00 \text{ Per Share}$$

Total Earnings Available to Shareholders of N. Ltd. after Merger

$$= \text{Rs.}3,00,000 \times \text{Rs.}5.00 = \text{Rs.}15,00,000$$

This is equal to Earnings prior Merger for N. Ltd.

∴ Exchange Ratio on the Basis of Earnings per Share is recommended.

Question 6

Write short notes on any four of the following :

- (a) Financial restructuring
- (b) Cross border leasing
- (c) Embedded derivatives
- (d) Arbitrage operations
- (e) Rolling settlement.

(4×5=20 Marks)

Answer

- (a) Financial Restructuring: Financial restructuring, is carried out internally in the firm with the consent of its various stakeholders. Financial restructuring is a suitable mode of restructuring of corporate firms that have incurred accumulated sizable losses for / over a

number of years. As a sequel, the share capital of such firms, in many cases, gets substantially eroded / lost; in fact, in some cases, accumulated losses over the years may be more than share capital, causing negative net worth. Given such a dismal state of financial affairs, a vast majority of such firms are likely to have a dubious potential for liquidation. Can some of these Firms be revived ? Financial restructuring is one such a measure for the revival of only those firms that hold promise/prospects for better financial performance in the years to come. To achieve the desired objective, 'such firms warrant / merit a restart with a fresh balance sheet, which does not contain past accumulated losses and fictitious assets and shows share capital at its real/true worth.

- (b) Cross-Border Leasing: Cross-border leasing is a leasing agreement where lessor and lessee are situated in different countries. This raises significant additional issues relating to tax avoidance and tax shelters. It has been widely used in some European countries, to arbitrage the difference in the tax laws of different countries.

Cross-border leasing have been in practice as a means of financing infrastructure development in emerging nations. Cross-border leasing may have significant applications in financing infrastructure development in emerging nations - such as rail and air transport equipment, telephone and telecommunications, equipment, and assets incorporated into power generation and distribution systems and other projects that have predictable revenue streams.

A major objective of cross-border leases is to reduce the overall cost of financing through utilization by the lessor of tax depreciation allowances 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.

- (c) Embedded Derivatives: An embedded derivative is a derivative instrument that is embedded in another contract - the host contract. The host contract might be a debt or equity instrument, a lease, an insurance contract or a sale or purchase contract. Derivatives require being marked-to-market through the income statement, other than qualifying hedging Instruments. This requirement on embedded derivatives is designed to ensure that market-to-market through the income statement cannot be avoided by including embedding - a derivative in another contract or financial instrument that is not market-to market through the income statement.

An embedded derivative can arise from deliberate financial engineering and intentional shifting of certain risks between parties. Many embedded derivatives, however, arise inadvertently through market practices and common contracting arrangements. Even purchase and sale contracts that qualify for executory contract treatment may contain embedded derivatives. An embedded derivative causes modification to a contract's cash flow, based on changes in a specified variable

- (d) **Arbitrage Operations:** Arbitrage is the buying and selling of the same commodity in different markets. A number of pricing relationships exist in the foreign exchange market, whose violation would imply the existence of arbitrage opportunities - the opportunity to make a profit without risk or investment. These transactions refer to advantage derived in the transactions of foreign currencies by taking the benefits of difference in rates between two currencies at two different centers at the same time or of difference between cross rates and actual rates.

For example, a customer can gain from arbitrage operation by purchase of dollars in the local market at cheaper price prevailing at a point of time and sell the same for sterling in the London market. The Sterling will then be used for meeting his commitment to pay the import obligation from London.

- (e) **Rolling Settlement :** SEBI introduced a new settlement cycle known as the 'rolling settlement cycle'. This cycle starts and ends on the same day and the settlement take place on the 'T+5' day, which is 5 business days from the date of the transaction. Hence, the transaction done on Monday will be settled on the following Monday and the transaction done on Tuesday will be settled on the following -Tuesday and so on. Hence unlike a BSE or NSE weekly settlement cycle, in the rolling settlement cycle, the decision has to be made at the conclusion of the trading session, on the same day, Rolling settlement cycles were introduced in both exchanges on January 12, 2000.

Internationally, most developed countries follow the rolling settlement system. For instance both the US and the UK follow a roiling settlement (T+3) system, while the German stock exchanges follow a (T+2) settlement cycle.