FINAL EXAMINATION

GROUP III

(SYLLABUS 2008)

SUGGESTED ANSWERS TO QUESTIONS

December 2012

Paper-12 : Financial Management & International Finance

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

The figures in the margin on the right side indicate full marks.
Please: (i) Answer all bits of a question at one place.
(ii) Open a new page for answer to a new question.
(iii) Tick the question number answered on the front sheet of the answer-book.

Answer Question No. 1 from Part A which is compulsory and any five from Part B

PART A (25 Marks)

1. (a) In each of the cases given below, one out of four answers is correct. Indicate the correct answer (=1 mark) and give workings/ reasons briefly in support of your answer (= 1 mark):

(i) Madura Steel earns 12% on the equity. The growth rate of dividends and earnings is 6%. The book value per share is ₹60. If the cost of equity is 14% , which of the following is the market price of the share of company, according to the Marakon Model of Valuation?

A. ₹36
B. ₹39
C. ₹45
D. ₹48

(ii) R Limited requires ₹3 Million in cash for meeting its transaction needs over the next 6 months, its planning horizon for liquidity decision. The company currently has the amount in the form of marketable securities. The cash payment will be made evenly over the six month period. R Ltd. earns 12% annual yield on its marketable securities. Conversion of marketable securities into cash entails a fixed cost of ₹1,000 per transaction. What will be the optimal conversion size as per Baumol model of cash management?

A. ₹3,15,628.
B. ₹3,16,228
C. ₹3,17,678
D. ₹3,18,428

(iii) The price of Swedish Krones is $0.14 today. If it appreciates by 10% today, how many Krones a dollar will buy tomorrow?

A. 6.49351

B. 4.69351

C. 3.49513

D. 5.64913

(iv) Calculate the future value of ₹1,000 invested in State Bank Cash Certificate scheme for 2 years @5.5% p.a., compounded semi- annually.

A. ₹1,114.62

B. ₹1,104.62

C. ₹1,401.51

D. ₹1,141.51

(v) A firm has sales of ₹75,00,000 variable cost of ₹42,00,000 and fixed cost of ₹6,00,000.It has a debt of ₹45,00,000 at 9% interest and equity of ₹55,00,000. At what level of sales, the EBIT of the firm will be equal to zero?

A. ₹28,48,500

B. ₹28,84,500

C. ₹22,84,500

D. ₹26,48,500

(vi) The sterline is trading at $1.6400 today. Inflation U.K. is 3.8% and that in U.S.A. is 2.9%. What would be the spot rate ($/£) after 2 years?

A. 1.5792

B. 1.5892

C. 1.6117

D. 1.6002

(vii) The following various currency quotes are available from the State Bank of India:

₹/£ 81.31/81.33

£/$ 0.6491/0.6498

$/¥ 0.01098/0.01102

The rate at which yen(¥) can be purchased with rupees will be:

A. 1.5270

B. 1.5890

C. 0.5824

D. 0.7824 **[2x7=14]**

(b) State if each of the following sentences is T (=true) or F (= false):

(i) Corporate tax rate does not affect cost of debt.

(ii) IRR and NPV always give the same profitability ranking.

(iii) Retention ratio is the product between growth rate and rate of return on investments.

(iv) Low financial leverage indicates high financial risk and vice – versa.

(v) If Profitability Index is 1, cash inflow and cash outflow would be equal.

(vi) A currency swap converts a stream of cash flow from one currency to another without exchange rate risk.

(vii) An investor expecting a fall in interest rates buys a floor and also a cap.

(viii) Commercial paper introduced by RBI in early 1990, is 'a secured promissory note' tied to any specific transaction.

(ix) A call option is 'in-the money' when the price of the underlying asset is below the exercise price of the call. [1x9=9]

(c) Match the assumptions to the different 'Capital Structure theories':

Assumptions

(i) Cost of debt and cost of equity are constant, and overall cost of capital decreases with increase in leverage.

(ii) Cost of debt and overall cost of capital are constant, and cost of equity will change with the degree of leverage.

(iii) Value of firm increases with increase in financial leverage upto a certain limit only.

(iv) Overall cost of capital and the value of firm are independent of the capital structure.

Capital Structure theories

(A) Modigliani- Miller approach

(B) Traditional approach

(C) Net Income approach

(D) Net operating Income approach

(Note : Your answer may be of the form:

Assumption No---------- Capital letter indicating Capital Structure theory) [1/2x4=2]

Answer 1. (a)

(i) C-₹45

$$\frac{B(r-g)}{k-g}=\frac{60(0.12-.06)}{(0.14-0.06)}=\frac{3.6}{0.08}=₹45$$

(ii) B-₹316228

Optimal Conversion size = $\sqrt{\frac{2bT}{I}}$, where , T= Estimated Cash requirement, b= conversion cost and I= Interest rate

$$=\sqrt{\frac{2x1000x3000000}{0.06}}=₹316228$$

(iii) A- 6.49351

The price of Swedish krones = $0.14

At 10% appreciation, it will be worth = $0.154

A dollar will buy $\frac{1}{0.154}=6.49351$ krones tomorrow

(iv) A- ₹1,114.62

$FV_n = PV\ (1+\frac{c}{m})^{mxn}$

$= 1000(\ 1+\frac{0.055}{2})^{2x2}$

$= 1000\ (1.0275)^4 = ₹1,114.62$

(v) C - ₹22,84,500

EBIT to became zero means 100% reduction in EBIT.

F. Leverage = $\frac{EBIT}{EBT} = \frac{2700000}{2295000} = 1.1764$

O. Leverage = $\frac{Contribution}{EBIT} = \frac{3300000}{2700000} = 1.2222$

Combined Leverage = 1.1764 x 1.2222= 1.438

Sales have to drop by 100/1.438 = 69.54%

New Sales will be = 7500000 x (1-0.6954) = ₹ 2284500(approx)

(vi) C- 1.6117

S ($/£) = F ($/£) x $(1+r\$)^2/(1+r£)^2$

$=1.64x (1+2.9\%)^2/(1+3.8\%)^2 = 1.64 x (1.029)^2/(1.038)^2$

$= 1.64 x (0.9913295)^2 = 1.64 x 0.9828 = 1.6117$

(vii) C – 0.5824

To purchase ¥, we need to have a quote of ¥ in terms of ₹.

We need only the 'ask' quote

Ask (₹/¥) = Ask (₹/£) x Ask (£/$) x Ask ($/¥)

= 81.33x0.6498x0.01102=0.5824

(b)

(i) False: Debt may be perpetual or redeemable debt, while calculating cost of debt, the corporate tax rate effect the formula as follows-

a) Perpetual /irredeemable debt:
K_d (after tax) = 1/P(1-t)
Where, t= tax rate,
P = net proceeds and k_d = Cost of debt, I= Interest

b) Redeemable debt : (after tax)

$K_d = \frac{I + 1/n(P - NP)}{1/2(P + NP)} x(1-t)$

(ii) False: When evaluating mutually exclusive projects, the one with the highest IRR may not be the one with best NPV. The conflict between NPV and IRR for evaluation of mutually exclusive projects is due to reinvestment assumption:

a) NPV assumes Cash flows reinvested at the Cost of Capital.
b) IRR assumes Cash flows reinvested at the internal rate of return.

(iii) False : As per Gordon's model, the growth rate is determined by the product of retention ratio and rate of return on investment.

(iv) False : Low financial leverage indicates less risky situation, low operating leverage combined with low financial leverage will constitute an ideal situation.

(v) True: We know that Profitability Index(PI) = PV of Cash Inflow/ PV of Cash Outflow. So, if P1 is 1, then cash inflow and cash outflow would be equal.

(vi) True : A currency swap converts a stream of cash flow from one currency to another without exchange rate risk. It enable a corporation to lower its borrowing costs in any desired currency.

(vii) True : A Cap provides variable rate borrowers with protection against raising interest rates while also retaining the advantages of lower or falling interest rate. Floors are used to obtain certainty for investments and budgeting by setting minimum interest rate on investments

(viii) False: Commercial Paper (CP) is an unsecured promissory note issued by a firm to raise funds for a short period, generally varying from a few days to a few months

(ix) False: A call option is not out- of- the money when the price of the underlying asset is below the exercise price of the Call and in- the – money when the price of underlying asset is above the striking price of the call.

(c)

(i) C
(ii) D
(iii) B
(iv) A

PART B (75 Marks for any five questions)

2. (a) The following data relates to two companies to the same risk class:

Particulars	**X Ltd.**	**Y Ltd.**
Expected Net Operating Income	**₹90,00,000**	**₹90,00,000**
10% debt	**₹60,00,000**	**----------**
Equity Capitalization rate	**14%**	**12.50%**

Required :

(i) Determine the total value and the weighted average cost of capital for each company, assuming no taxes.

(ii) Show the arbitrage process by which an investor who holds shares worth ₹90,000 in Y Ltd. will be benefited by investing in X Ltd.

(iii) Will he gain by investing in the undervalued firm? [3+4+1.5+1.5=10]

(iv) When will this arbitrage process come to an end?

(b) Briefly describe stochastic Model of Cash Management. [5]

Answer. 2(a) (i) Calculation of total value of Firm and weighted Average Cost of Capital

	X Ltd.(₹)	**Y Ltd.(₹)**
Net Operating Income (NOI)	90,00,000	90,00,000
(-) Interest on Debt	6,00,000	-
Earnings for Eq. Shareholders (NI)	84,00,000	90,00,000
Equity Capitalization rate (Ke)	0.14	0.125
Market Value of Equity ($) [NI/Ke]	6,00,00,000	7,20,00,000
Market Value of Debt (D)	60,00,000	-
Total Value of Firm (V)	6,60,00,000	7,20,00,000
Weighted average cost of Capital (Ko) = (Ke x S/V + Kd x D/V)	0.13636	0.12500
WACC	13.636%	12.50%

2.(a) (ii) Arbitrage Process:

A. Investor present position in overvalued firm

	₹
Market value of investment	90,000
Dividend of Income (12.5% of 90,000)	11,250
B. He sells his present equity holdings for	90,000
C. He purchases equity of under-valued firm	
[90,000/7,20,00,000 x 6,00,00,000]	75,000
He purchases Debt (90,000 /7,20,00,000 x 60,00,000)	7,500
Total Investment	82,500

D.His Net Income after switching:

Dividend Income (14% of ₹75,000)	10,500
Interest on Income of Debt (10% on 7500)	750
Net Income	11,250

Reduced out lay = 90,000-82,500 = ₹7,500

(iii) He will gain by investing in undervalued firm, since the same amount of present income can be earned by investing ₹82,500 which is less than the present investment of ₹90,000.

(iv) According to Modigliani and Miller, this arbitrage process will come to an end, when the values of both the companies become identical.

2. (b) Stochastic Model of Cash Management

This model is developed to avoid the problems associated with EOQ mode. Model developed by Miller and Orr. The basic assumption of this model is that cash balances are irregular. The model prescribed two control limits.

Upper Control Limits (UCL) – When cash balance reaches the upper limits, a transfer of cash to investment account should be made.

Lower Control Limits (LCL)- When cash balance reaches the lower point, a portion of securities from investment account should be liquidated to return the cash balances to its return point.

The Miller and Orr model is the simplest model to determine the optimal behavior in irregular cash flow situation. The model is a control limit model to determine the time and size of transfers between an investment account and cash account. The optimal point (O) of cash balance is determined by

$$O = \sqrt[3]{\frac{3TV}{4I}}$$

Where O-target (Optimal) cash balance; T- Fixed cost associated with security transactions; I-Interest per day on marketable securities; V- Variance of daily net cash flows.

Limitations : Problems in respect of collection of data- cost of time devoted by finance manager- does not take in account short-term borrowings.

1) The first and important problem is in respect of collection of accurate data about transfer costs, holding costs, number of transfers and expected average cash balance.
2) The cost of time devoted by financial managers in dealing with the transfers of cash to Securities and vice-versa.
3) The model does not take into account the short-term borrowings as an alternative to selling of marketable securities when cash balance reaches lower limit.

3. (a) A Company has developed a new toy which has been estimated to have a life cycle of 3 years. To manufacture the toy, the company will have to purchase a semi- automatic injection moulding machine at a cost of ₹8,60,000. The machine will have to be scrapped after 3 years at a salvage of ₹1,10,000. Variable cost of producing the toy would be 40% of the sales price.
Fixed expenses, apart from depreciation will be ₹50,00 per year. Besides, advertising and selling expenses will have to be incurred at the rate of ₹1,00,000 in the first year, ₹1,50,000 in the second year and ₹.50,000 in the third year. The following projections of sales have been made after evaluating the consumer demand:

Probability	**Estimated Sales in year (₹ Lakhs)**		
	Year 1	**Year 2**	**Year 3**
0.3	**12**	**25**	**10**
0.6	**7**	**17**	**15**
0.1	**2**	**9**	**4**

The Company is subject to corporate tax rate of 30% and its cost of capital is 15%.
Prepare a schedule computing the probable sales of the new toy and estimated cash flows in each of the three years. Also determine net present value (NPV) of the proposal. Ignore tax on salvage value.
The present value of ₹1 earned at the year end discounted at 15%---------

Year 1	**Year 2**	**Year 3**	
0.870	**0.756**	**0.658**	**[10]**

(b) How is Economic Value Added (EVA) different from Market Value Added (MVA) ? [5]

Answer. 3. (a) Schedule showing Sales:

(Amount in ₹ lakh)

Probability	Year 1		Year 2		Year 3	
0.3	X 12	3.6	X 25	7.5	X 10	3
0.6	X 7	4.2	X 17	10.20	X 15	9
0.1	X 2	0.2	X 9	0.9	X 4	0.40
		8.0		18.60		12.40

Determination of estimated cash flow: **₹ (lakh)**

	Year 1	**Year 2**	**Year 3**
Probable Sales revenue	8.00	18.60	12.40
Less: Variable cost @40%	3.20	7.44	4.96
	4.80	11.16	7.44
Less: Depreciation ₹(8,60,000-1,10,000)/3	2.50	2.50	2.50
Fixed cost	0.50	0.50	0.50
	1.80	8.16	4.44
Less: Advt. & Sales Exp.	1.00	1.50	0.50
Earning before Tax	0.80	6.66	3.94
Tax @ 30%	0.24	2.00	1.18

Earning after Tax	0.56	4.66	2.76
Total Cash flow after tax (add back Depreciation)	3.06	7.16	5.26
Add: salvage value	-	-	1.10
	3.14	7.16	6.36

Determination of NPV	**CFAT**	**PV factor**	**Total PV**
Year 1	3.06	0.870	2.662
2	7.16	0.756	5.413
3	6.36	0.658	4.185
			12.26
Less: Cash outflow (Investment)			8.60
NPV			3.66

(b) MVA is the excess of market value of the firm as reflected in share price and the value of the debt, over the book value of the capital employed. This book value of the capital employed includes the value of reserves and surplus. The MVA is considered a better measure of corporate performance than the market capitalization.

Mathematically, MVA = Market value of the firm – Capital Employed

EVA can be defined from two perspectives – (a) Accounting and (b) Finance

From the accounting perspective, EVA is defined as the difference between the firm's net operating profits after tax (NOPAT) and its weighted average rupee cost of capital

Since EVA fully accounts for the firm's overall capital costs, it differs from the traditional metrics of financial performance such as EBIT, EBITDA, EAT etc.

Mathematically, EVA = NOPAT – Capital Cost

= NOPAT – (WACC X Capital Employed)

= (r x Capital Employed – c x Capital Employed)

Thus, EVA = (r-c) x Capital Employed

4.(a) The selected financial data for A,B and C companies for the year ended March 31,2012 are as follows:

Company	**A**	**B**	**C**
Financial leverage	**3:1**	**4:1**	**2:1**
Interest	**₹200**	**₹300**	**₹1,000**
Operating leverage	**4:1**	**5:1**	**3:1**
Variable cost as a % to sales	**66 2/3%**	**75%**	**50%**
Income tax rate	**45%**	**45%**	**45%**

(i) Prepare Income statement for the year ended 31st March, 2012 for each company.

(ii) Comment on the financial position and capital structure of these companies. [7+3=10]

(b) What do you understand by 'hybrid debt security' ? Give examples. [5]

Answer. 4 (a).

Company A:	
Financial Leverage = 3	Operating Leverage = 4
$\frac{EBIT}{EBIT-200}=3$ 3(EBIT-200) = EBIT 3EBIT –EBIT= 600 EBIT= 300	$\frac{Contribution}{EBIT}=4$ $\frac{Sales-V.Cost}{300}=4$ Sales – 66 2/3% sales = 1200 33 1/3% of Sales = 1200 Sales = 1200x 3 = 3600
Company B: $\frac{EBIT}{EBIT-300}=4$ 4(EBIT – 300) = EBIT 3EBIT = 1200 EBIT = 400	$\frac{Sales-V.Cost}{400}=5$ Sales – 75% Sales = 2000 25% Sales = 2000 Sales = 2000x4 =8000
Company C : $\frac{EBIT}{EBIT-1000}=2$ 2(EBIT – 1000) = EBIT EBIT = 2000	$\frac{Sales-V.Cost}{2000}=3$ Sales- 50% on Sales = 6000 50% Sales = 6000 Sales = 12,000

Income Statement of Companies

	A	B	C
Sales	3600	8000	12000
(-) Variable Cost	2400	6000	6000
Contribution	1200	2000	6000
(-) Fixed Cost (Contribution-EBIT)	900	1600	4000
EBIT	300	400	2000
(-) Interest	200	300	1000
	100	100	1000
(-) Tax @ 45%	45	45	450
	55	55	550

Comment on the financial position -_ Company C is better than that of the other companies A and B because of the following reasons:

- Company C has the least financial risk
- Total risk (business and financial) complexion of company is the lowest (DCL: A-12, B-20, C-6)
- Capacity of Company C to meet interest liability is better than that of companies A and C (from EBIT/ Interest ratio)
  [A = 300/200 = 1.5 B = 400/300 = 1.33 C = 2000/1000= 2]

(b) A hybrid security is debt security combined with derivative such as forward, swap or option. A new breed of hybrid securities has become very popular, particularly in USA. The distinctive feature of these securities is that the payoffs instead of being related to the stock price of the issuing company (as in the case with conservative bond), are linked to some general economic variables like the interest rate, exchange rate, commodity price, stock market index, and so on. Hybrids are essentially devices for managing risk.

Examples of different types of hybrids are given below:

(i) Hybrids to manage commodity risk. This hybrid includes a zero coupon bond and a call option.

(ii) Hybrids to manage foreign exchange risk. This is a dual currency bond which includes principle amount in one currency and interest in other country currency. and

(iii) Hybrid to manage interest rate risk:

Two kinds – (a) a floating rate bullet repayment note, and

(b) a plain interest swap for double the principal.

5. (a) Trinadh Traders Limited currently sells on terms of net 30days. All the sales are on credit basis and average collection period is 35 days. Currently, it sells 5,00,000 units at an average price of ₹50 per unit. The variable cost to sales ratio is 75% and a bad debt to sales ratio is 3%. In order to expand sales, the management of the company is considering changing the credit terms from net 30 to 2/10, net 30.

Due to change in policy, sales are expected to go up by 10%, bad debt loss on additional sales will be 5% and bad debt loss on existing sales will remain unchanged at 3%. 40% of the customers are expected to avail the discount and pay on the tenth day. The average collection period for the new policy (in respect of additional sales) is expected to be 34 days. The company required a return of 20% on its investment in receivables.

You are required to find out the impact of the change in credit policy on the profit of the company. Also advise the management on implementation of new policy. Ignore taxes. Assume 1 year = 360 days. [10]

(b) Indicate the important accounting ratios that would be used by each of the following:

(i) A long – term creditor interested in determining whether his claim is adequately secured.

(ii) A bank who has been approached by a company for short-term loan / overdraft.

(iii) A Shareholder who is examining his portfolio and who is to decide whether he should hold or sell his shares in a company. [1x3=3]

(c) Unit Cost Structure of a product at an activity level of 60,000 units per annum:

	₹
Raw Material	**5**
Wages	**4**
Manufacturing overheads (including depreciation ₹1)	**3**
Administrative expenses	**1**
Selling and distribution expenses	**2**

Production cycle is half-month. Calculate the value of stock of work-in- progress (on cash cost basis), if the degree of completion as to material is 80% and as to conversion cost is 60%. [2]

Answer 5. (a) Appraisal of Credit Policy

	Present	**Proposed**
Credit Terms	Net 30	2/10, Net 30
ACP (Average Collection Period)	35 days	34 days
Discount Sales	-	40%
Bad debts	3%	3%+5%
Sales (in units)	5,00,000	5,50,000

Incremental Profit = 50000x50x25% = 6,25,000
Incremental Bad debts = 50000x50x5% = (1,25,000)
Discount = 5,50,000x40%x50x2% = (2,20,000)
Incremental Investment in receivables = 50,000 x 50 x 75% x 34/360
= 1,77,083
Finance Cost = 1,77,083 x 20/100 = (35,417)

Total Benefits =₹6,25,000
Total Cost = 1,25,000 + 2,20,000 + 35,417
=₹3,80,417
Net benefit due to new policy = ₹(6,25,000 – 3,80,417) = ₹2,44,583
Hence, Management is advised to implement the New credit policy.

(b)
(i) Debt- Service Coverage Ratio and Interest Coverage Ratio.
(ii) Current Ratio and Quick Ratio.
(iii) Return on Equity, Earning per share, Dividend per share.

(c) Raw material (2,500 units x ₹5 x80%) = ₹ 10,000
Wages (2500units x ₹4 x 60%) = ₹ 6,000
Manufacturing overheads (Except Depreciation)
(2500 units x ₹2 x 60%) = ₹ 3,000

Stock of WIP ₹ 19,000

6.(a) Given: Stock Price = $.23
Exercise Price =$ 18
Risk-free rate = 0.06
Time to expire = 1.0 (1 year)

Standard deviation of the stock's return = 0.50 (variance is 0.25)

What is the value of this option?

(For N (0.86) = 0.805 and N (0.36) = 0.6405) [5]

(b) An Indian customer who has imported equipment from Germany has approached a bank for booking a forward Euro contract. The delivery is expected six months from now. The following rates are quoted:

($/Euro) spot 0.8453/0.8457

6m- Swap points 15/20

₹/$ spot 46.47/46.57

6m- Swap points 20/30

What rate the bank will quote, if it needs a margin of 0.5%? [5]

(c) What do you understand by 'External Commercial Borrowing' (ECB)? Mention two agencies engaged in ECB. [5]

Answer 6.(a) First calculate d1 and d2

$$d1 = \frac{In(\frac{P}{X}) + [r + \frac{s}{2}^2]t}{s\sqrt{t}}$$

$$= \frac{In(\frac{23}{18}) + [0.06 + (\frac{0.25}{2})](1.0)}{(0.50)\sqrt{1.0}}$$

= 0.86

D2= d1-s $\sqrt{t}$ = 0.86-(0.50) $\sqrt{1}$ = 0.36

Given N (0.86) = 0.805 and N (0.36) = 0.6405

Use the above values to find the option's value

V = P[N(d1) – x e^{-rt} [N(d2)]

=23 [0.805]-18$e^{-(0.06)(1.0)}$ [0.6405]

=$ 7.66

(b) First calculate outright forward rates

$/€ 6 month Forward rates:

Bid rate = 0.8453 + 0.0015 = 0.8468

Offer rate = 0.8457 +0.0020 = 0.8477

₹/$ 6m Forward Rates:

Bid rate = 46.47 + 0.20 = 46.67

Offer rate = 46.57+0.30 = 46.87

The customer needs € to pay for imports. He would purchase Euros. Therefore, he needs a quote of Euro in Rupee terms. We therefore, need to find only ask quote.

(₹/€) = ((₹/$) x ($/€) =46.87 x 0.8477

The Bank would quote ₹39.73+0.5% = ₹39.93/€

(c) External Commercial Borrowing (ECB) is the amount borrowed by the Government through designated agents from all India Financial Institutions (AIFIs). The government borrowed these amounts in the international money market during 1991 and 1992 to meet the massive exchange deficits. The lenders include Asian Development Bank (ADB) and International Monetary Fund (IMF). Our country has also been obtaining foreign capital in the form of external commercial borrowings from agencies like US EXIM Bank, Japanese EXIM Bank, Export Credit Guarantee Corporation (ECGC) of UK etc.

There are 3 options under ECB:

(i) Raising loan from foreign Commercial Banks.
(ii) Raising funds, by floating bonds, in the international market.
(iii) Supplier Countries export credit.

7. (a) Consider the following rates:

Spot ₹/$ 42.17/42.59

₹/ DM 24.61/25.10

3m forward ₹/$ 43.15/43.60

₹/ DM 25.36/25.90

(i) From these rates, calculate the spot and forward DM/$ rates. [5]
(ii) What are the upper and lower boundaries for the DM/$ quotations. [4]

(b) When do you think money market hedging is not beneficial? [2]
(c) State the two components of value of currency option. Show a relationship between volatility of currency and option value. [4]

7. (a) Given: Spot: ₹/$ 42.17/42.59
₹/DM 24.61/25.10
3m forward : ₹/$ 43.15/43.60
₹/DM 25.36/25.90

(i) Calculation of Spot DM/$ rates

We know that is Bid $\frac{(DM)}{\$}$ = Bid (DM/₹) x Bid (₹/$)

We do not have a quote of DM/₹, Instead
We have ₹/DM . Hence we use

Bid $\frac{(DM)}{\$}$ = 1/Ask (₹/DM)

Substituting the values, we get Bid rate for
DM/$ = 1/25.10 x 42.17 = 1.6800
Similarly Ask (DM /$) = Ask (₹/$) x 1/(₹/DM)
= 42.59 x 1/24.61 = 1.7305

We thus get the (DM /$) quote as $\frac{1.6800}{1.7305}$

Calculation of 3m forward DM/$ rates:
Similarly we get 3m forward quote for (Dm/$) as

$\frac{1.6660}{1.7192}$

(ii) Upper boundary for Spot rate is 1.7305
Lower boundary for Spot rate is 1.6800
Upper boundary for forward rate is 1.7192
Lower boundary for forward rate is 1.6660

(b) When interest rate parity holds and no arbitrage- opportunities exit, money market hedge and the forward hedge provide identical costs. In such a scenario, money market hedging is not beneficial.

(c) (i) The intrinsic value – the amount by which an option is in the money. A call option whose exercise price is below the current spot price of the underlying instrument, or a put option whose exercise price is above the current spot price of the underlying instrument, is said to be in the money.
(ii) **The extrinsic value -** it is the total price of an option less the intrinsic value. It is also known as time value or volatility value. As the expiry time increase, the premium of an option also increases. However, with each passing day, the rate of increase in the premium decreases. Conversely, as an option approaches expiry, the rate of decline in its intrinsic value increases. This decline is known as the time decay. Therefore, the more volatile a currency, the higher will be its option value.

8 Write short notes on (*any three*) : [5x3=15]

a) Risk Adjusted Discount Rate (RADR)
b) Interest Rate Floors
c) Forward Rate Agreements (FRA)
d) Project Life Cycle

Answer 8.

(a) Risk Adjusted Discount Rate (RADR) : RADR attempts to incorporate risk by modifying the discount rate. A risk premium is added to the riskless discount rate, to reflect the risk inherent in the project. The RADR approach to handle the risk in a capital budgeting decision process is a more direct method. The RADR is based on the premise that riskiness of a proposal may be taken care of, by adjusting the discounting rate. The cash flows from a more risky proposal should be discounted at a higher discount rate as compared to other proposals whose cash flows are less risky. The RADR may be expressed in terms of the following Equation;

The RADR is used to find out the Risk Adjusted NPV (RANPV) of the proposals as per following Equation:

RADR = Risk Free Return + Risk Adjusted Premium

$$\text{RANPV} = \sum_{i=1}^{n} \frac{CFi}{[1+R_a]} - Co$$

RANPV = Risk Adjusted NPV

CFi= Cash Inflows occurring at different points of time

Co= Initial Cash Outflows

R_a = Risk Adjusted Discount Rate

(b) Interest Rate Floor: Variable rate investors are the typical users of Interest Rate Floors. They used Floors to obtain certainly for their investments and budgeting process by setting the minimum interest rate they will receive on their investments. By implementing this type of financial management, variable rate investors obtain peace of mind from falling interest rates and the freedom to concentrate on their aspect of their business / investments. An Interest Rate Floor enables variable rate investors to retain the upside advantages of their variable rate investment while obtaining the comfort of a known minimum interest rate.

(c) Forward Rate Agreement (FRA) :

FRA is an agreement between two parties who wishes to protect themselves against fluctuations in interest rates. The parties agree on an interest rate for a specific period of time on a specified Principal amount. The buyer of an FRA is a party wishing to protect itself against a decline. The price of FRA will depend on the slope of the yield curve which reflects interest rate expectations – FRAs now cover a wide selection of currencies and maturities- Helps a corporate crystallize its interest costs – Banks can offer FRAs linked to the LIBOR.

(d) Project Life Cycle: The method of dividing the phases in a project. It provides a framework for budgeting manpower and resources allocation and for scheduling project milestones and project reviews. The various phases are:

(i) Concept or initialization phase – Project idea emerges and the management decides on the need for a project.
(ii) Project definition phase – techno- economic viability – technical configuration – performance requirement- cost estimates with limits and schedule of implementation.
(iii) Growth or organization phase- includes establishing infrastructure, Project Engineering design, setting up Project organization, Preparation of schedules and budgets- raising finance- obtain licenses- tenders etc.
(iv) Implementation phase- preparation of specifications, placing orders- Invite bids- Evaluating bid- issuing construction drawings- Installation – Piping – testing – Commissioning of the plant.
(v) Project shutdown and clean-up –P & M built and erected with the active involvement handed over for production to a different agency.