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10MBAFM427

**Fourth Semester MBA Degree Examination, June 2012**  
**Risk Management**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FOUR full questions from Q.No.1 to 7.**  
**2. Q.No. 8 is compulsory.**  
**3. Use of  $N(x)$  tables is permitted.**

- 1**
- a. Differentiate between exchange traded and over the counter derivatives. (03 Marks)
  - b. Explain the features of a forward contract. (07 Marks)
  - c. An investor buys 5 futures contract on gold at MCX of India. Each contract is for 100gm of gold. The price quotation is Rs.15,550 per 10gm. The initial margin is set at 4%. While the maintenance margin is 90% of the initial margin.  
Find out the gain or loss on daily basis for short and long positions in 5 contracts of gold if clearing prices for next 10 days are as given below.

Day	Price (Rs.)
1	15,520
2	15,305
3	15,410
4	15,220
5	15,440
6	15,340
7	15,600
8	15,630
9	15,670
10	15,870

Indicate the position of margin account and margin calls, if any, on daily basis when the contracts are marked to market. (10 Marks)

- 2**
- a. Suppose that you enter into a month forward contract on a non dividend paying stock when the stock price is Rs.30 and the risk free rate (with continuous compounding) is 12% p.a. What is the forward price? (03 Marks)
  - b. A company has a \$20 million portfolio with a beta of 1.2. It would like to use futures contracts on the S and P 500 to hedge its risk. The index futures price is currently standing at 1080 and each contract is for delivery of \$250 times the index. What is the hedge that minimizes risk? What should the company do if it wants to reduce the beta of the portfolio to 0.6? (07 Marks)
  - c. From the following data, calculate the values of call and put options using Black-Scholes model.  
Current price of the share Rs.42  
Exercise price Rs.40  
Time to expiration 6 months.  
Risk free rate of return (continuously compounded) 10% p.a. Standard deviation 0.20. (10 Marks)

- 3 a. What is open interest? (03 Marks)  
 b. Differentiate between American and European options. Discuss the factors affecting option prices. (07 Marks)  
 c. Consider a long forward contract to purchase a coupon bearing bond. The current price of the bond is Rs.900. Suppose that the forward contract matures in 9 months. The coupon payment of Rs.40 is expected after 4 months. Assume that the 4 month and 9 month risk free interest rates (continuously compounded) are respectively 3% and 4% per annum. Examine how arbitrage works for the assumed forward prices of i) Rs.910; ii) Rs.870. Calculate the arbitrage profit also. (10 Marks)

- 4 a. What is a butterfly spread? (03 Marks)  
 b. An investor has purchased shares of ABC Ltd at Rs.440 per share. Anticipating decline in the share price, he bought a put option on ABC stock at Rs.45 per share with a strike price of Rs.425 per share. Show the pay offs and draw a graph indicating the results if the possible price range of stock on expiration date is:

Rs. zero	Rs.350	Rs.560
Rs.150	Rs.440	
Rs.210	Rs.500	

- (07 Marks)  
 c. What is value at risk? Discuss the various approaches to determine value at risk. (10 Marks)
- 5 a. What is credit risk? (03 Marks)  
 b. What are forward rate agreements (FRAs)? Bring out the characteristics of FRAs. (07 Marks)  
 c. Two Indian firms Indoplas and Indocar are contemplating to raise finance of Rs.100 crore each. They have been offered following loans by a bank.

	Fixed rate	Floating rate
Indoplas	12%	MIBOR + 70 bps
Indocar	11%	MIBOR + 30 bps

Another bank acting as swap intermediary is willing to work out a swap arrangement for a fee of 5bps from each firm. Indocar believes that interest rate would fall and hence wants to raise funds in the floating rate basis. Indoplas feels otherwise and likes to raise funds on fixed interest rate basis. What swap can be arranged between the two parties? What would be the saving in financing cost of each firm? (10 Marks)

- 6 a. Differentiate between stress testing and back testing. (03 Marks)  
 b. The call option on a stock are quoted on a stock exchange as:

Option price	Strike price
28	350
50	310
55	290

Construct a suitable spread strategy from the view point of a trader who is anticipating decline in the stock price and work out the pay offs from the strategy if the possible price of stock on the expiration date is in the range of: (07 Marks)

Rs.170	Rs.300	Rs.400
Rs.250	Rs.340	

- c. Explain credit default swaps, total return swaps and collateralized debt obligation. (10 Marks)

- 7 a. What is a straddle? (03 Marks)  
 b. What are commodity futures? Discuss the benefits of commodity futures. (07 Marks)  
 c. An investor holds a portfolio consisting of five securities as shown below:

Sl. No.	Security	No. of shares	Price (Rs.) of share	Beta
1	A	400	120	0.7
2	B	200	32	0.8
3	C	1,000	68	1.6
4	D	6,000	230	1.2
5	E	700	500	1.2

Fearing a market crash, the investor is considering hedging his portfolio by using December put options on S and P CNX nifty available with exercise value 1532 and delta -0.432. Nifty options have a lot requirement of 200 units.

How many contracts the investor should buy for hedging the portfolio value? (10 Marks)

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### CASE STUDY

Suppose that a futures contract with four months to maturity is used to hedge the value of a portfolio over the next 3 months in the following situation:

- i) Value of S and P 500 index 1000
- ii) S and P 500 futures price 1010
- iii) Value of portfolio \$50,50,000
- iv) Risk free interest rate 4% per annum
- v) Dividend yield on index 1% per annum
- vi) Beta of portfolio 1.5.

One futures contract is for delivery of \$250 times the index.

- a. Determine the number of futures contracts that should be shorted to hedge the portfolio.
- b. Suppose that the index turns out to be 900 in 3 months and the futures price is 902, determine the gain from short futures position.
- c. Suppose that the index turns out to be 900, calculate the expected return on portfolio according to CAPM.
- d. Calculate the expected value of the portfolio. (20 Marks)

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