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10MBAFM427

Fourth Semester MBA Degree Examination, December 2012
Risk Management

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FOUR questions, from Q.No.1 to Q.No.7.***
2. ***Q.No. 8 is compulsory.***

1 a. List out the factors affecting the stock option prices. **(03 Marks)**

b. The spot price of the silver is Rs 17, 850 per kilogram. The storage cost is Rs 175 per kilogram payable quarterly in advance. Assuming that interest rates are 10% per annum for all maturities, calculate the futures price of the silver for delivery in 9 months. Find the arbitrage opportunity if the 9 month futures is selling at Rs 18500/-. **(07 Marks)**

c. What is risk management? Explain the process of risk management. **(10 Marks)**

2 a. Differentiate between interest rate caps and floors. **(03 Marks)**

b. A butterfly spread is to be created with the given information on Infosys for which one contract involves 500 shares.

Strike price :	Rs 470	Rs 490	Rs 510
Premium	Rs 50	Rs 35	Rs 32

Find the pay off for the investor who goes for butterfly spread at various ranges of stock prices of Rs 455, Rs 480, Rs 500, Rs 515. **(07 Marks)**

c. Assume that a market capitalization weighted index contains only three stocks A, B and C as shown below. The current value of the index is 10560.

Company	Share price (Rs)	Market Capitalization (Rs. Crores)
A	1200	120
B	500	300
C	800	200

Calculate the price of a futures contract with expiration in 60 days on this index, if it is known that 25 days from now, Company A and B would pay dividend of Rs 12 and Rs 8 per share. C would pay Rs 15 as dividend 25 days before the expiry of the contract now. Take the risk free rate of interest to be 12% per annum compounded quarterly. Assume the lot size to be 200 units. **(10 Marks)**

3 a. Define principle of subrogation in insurance. **(03 Marks)**

b. Consider a position consisting of a Rs 1,00,000 investment in asset A and Rs 1,00,000 in asset B. Assume that the daily volatilities of both assets are 1% and that the coefficient of correlation between their returns is 30%. What is the 5 – day 99% VaR for the portfolio? Also calculate the diversified risk benefit. **(07 Marks)**

c. What is credit risk management? Explain various credit derivative instruments. **(10 Marks)**

4 a. Write any three differences between futures and options contracts. **(03 Marks)**

b. Who are the participants in derivative markets? How do they benefit through usage of derivatives? Explain with suitable example. **(07 Marks)**

c. Calculate the delta of an at – the – money six month European call option for a non – dividend paying stock when the risk free rate of interest is 10% per annum and the stock price volatility is 25% per annum. Calculate the call option price. **(10 Marks)**

5 a. Write any three important functions of commodity futures trading that performs in an Economy. **(03 Marks)**

b. Define value at Risk. Give the uses of the VaR calculation for the market participants. **(07 Marks)**

c. An investor took short position in 10 future contracts on rice at an exercise price of Rs 22 per kg. The size of one future contract is 1000 kgs. The initial margin requirement on this contract is 12% of the contract value and the maintenance margin is 75% of initial margin. The future prices for first 10 days of the contract are given below. Prepare a margin account for first 10 days assuming that all margin calls are honoured immediately and money in excess of the initial margin is not withdrawn immediately. **(10 Marks)**

Day	1	2	3	4	5	6	7	8	9	10
Price per kg in Rs	21.50	22.25	22.75	22.40	22.70	22.50	23.75	23.25	22.80	23.00

6 a. What is stress testing in risk measure? **(03 Marks)**

b. Firm A is a US based multinational firm whereas Firm B is a France based multinational firm. Both companies need to raise capital for their new ventures and due to scarcity firm A can issue five – year US $ bond in US market as 7.5% and five year French Franc (FFc) bond in French market at 11% fixed. Firm B can issue five – year US $ bond in US market at 7% and five year FFc bond in French market at 12% fixed. Firm A requires US $ 100 million, whereas firm B needs FFc 550 million. Current exchange ratio is 5.5FFc = US $ 1. What kind of swap can Firm A and B enter into? Frame the swap contract with diagram and calculate the total cost and saving for each party through swap. **(07 Marks)**

c. What is Forward Markets Commission (FMC)? Explain the functions of the Forward Market Commission. **(10 Marks)**

7 a. What are Forward Rate Agreements (FRAs)? **(03 Marks)**

b. The current price of a share is Rs 50 and it is believed that at the end of one month the price will be either Rs 55 or Rs 45. What will a European call option with an exercise price of Rs 53 on this share be valued at, if the risk free rate of interest is 15% per annum? **(07 Marks)**

c. The following table gives the prices of the bonds :

Bond principal (Rs)	Time to maturity in years	Annual coupon	Bond price
100	0.5	0	98
100	1.0	0	95
100	1.5	6.2	101
100	2.0	8	104

i) Calculate zero rates for maturities of 6 months, 12 months, 18 months and 24 months.

ii) What are the forward rates for the periods : 6 months to 12 months, 12 months to 18 months, 18 months to 24 months.

iii) Estimate the yield of a two – year bond providing a semi annual coupon of 7% per annum. **(10 Marks)**

8 CASE STUDY :

Mr. Rakesh purchased a 3 month call option in the equity share of Kiran Engineering Company. It has present market value per share of Rs 120, exercise price of Rs 130. At the end of 3 months, the investor expects the price of the share to be in the range of Rs 90 to Rs 200, with the following probabilities.

Expected Price (Rs)	90	110	140	175	200
Probability	0.10	0.25	0.30	0.20	0.15

You are required to answer the following :

a. What is the expected value of share price 3 months from now? What is the value of call option at expiry if the expected value of the share prevails at the end of 3 months? **(07 Marks)**
b. Determine the gain or loss to the call option holder and seller if the share price at expiry is Rs 146. Show the pay off diagram. The call option premium is Rs 6/-. **(07 Marks)**
c. Determine the price per share on expiry at which call option buyer and seller will be at break even point. **(03 Marks)**
d. Determine the maximum gain to the call option buyer and seller. What is its probability? **(03 Marks)**

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