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14MBAFM411

Fourth Semester MBA Degree Examination, June/July 2017
Financial Derivatives

Time: 3 hrs.

Max. Marks: 100

Note: Use of natural logarithms, e^x , e^{-x} and normal distribution tables is permitted.

SECTION - A

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

- 1 Write short note on "margin account and marking to market". (03 Marks)
- 2 What do you mean by cash settlement? (03 Marks)
- 3 When is the option said to be: i) in-the money, ii) out of the money and iii) at the money? (03 Marks)
- 4 What are American option and European option? (03 Marks)
- 5 What is forward rate agreement? (03 Marks)
- 6 Define LIBOR and LIBID. Which is higher? (03 Marks)
- 7 What is treasury rates? (03 Marks)

SECTION - B

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

- 1 Explain the role of different types of traders in the derivatives market. (07 Marks)
- 2 Describe the rules for determining the prices for forward contract. (07 Marks)
- 3 Distinguish between forward/futures and options. (07 Marks)
- 4 What is mean by commodity derivatives and financial derivatives? Distinguish. (07 Marks)
- 5 What is credit default swap? Explain the features of a credit default swap. (07 Marks)
- 6 A financial institution quotes an interest rate of 12% per annum, with quarterly compounding. What is the equivalent rate with, (i) Continuous compounding, (ii) Annual compounding, (iii) Semi-annual compounding, (iv) Monthly compounding, (v) Daily compounding? (07 Marks)
- 7 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 1056:

Company	Share price	Market capitalization
A	120	12
B	50	30
C	80	24

Calculate the price of a future contract with expiration in 60 days on this index if it is known that 25 days from today, company A would pay a dividend of Rs.8 per share. Take the risk-free rate of interest to be 15% per annum. Assume the lot size to be 200 units. (07 Marks)

SECTION - C

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

- 1 An investor took short position 10 futures 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 the initial margin. The futures price for the first 10 days of the contract is 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 withdrawn immediately.

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

(10 Marks)

- 2 a. A share is currently selling in the market for Rs.250. A future contract maturing after 45 days is available on the same for Rs.280. the risk free rate of interest is 9% p.a.
- Calculate the value of future contract and
 - How can an investor make arbitrage profit in this situation and what will be the amount of profit if market lot size is 500?
- b. A wheat contract is trading in the market for Rs.1600 per quintal. A 6 months futures contract on this wheat is traded at Rs.1675. The size of one future contract is one quintal. Amount of Rs.25 has to be paid for storage cost per quintal of wheat for 6 months. The continuously compounded risk free rate is 8% p.a.
- Is there any arbitrage opportunity here if so design an arbitrage?
 - How much profit can be made from this by him?

(10 Marks)

- 3 An investor holds a portfolio value consisting of five securities as shown below:

Security	No. of Shares	Price of share	Beta
A	400	120	0.7
B	200	32	0.8
C	1000	68	1.6
D	6000	230	1.2
E	700	500	1.2

Fearing a market crash, the investor is considering hedging its portfolio by using December put option on s & p CNX Nifty available with exercise value of 1532 and $\delta = -0.432$. What should he do, if lot size is 100?

(10 Marks)

- 4 Companies A and B face the following interest rates (adjusted for the differential impact of taxes):

U.S dollars (floating rate)	LIBOR + 0.50%	LIBOR + 1.0%
Canadian dollars (fixed rate)	5.0%	6.5%

Assume that A wants to borrow U.S. dollars at a floating rate of interest and B wants to borrow Canadian dollars at a fixed rate of interest. A financial institution is planning to arrange a swap and requires a 50 basis-point spread. If the swap is equally attractive to A and B, what rates of interest will A and B end up paying?

(10 Marks)

- 5 A five-year bond with a yield of 11% (continuously compounded) pays an 8% coupon at the end of each year. (Assume face value of bond Rs.100)
- What is the bond's price?
 - What is the bond's duration?
 - Use the duration to calculate the effect on the bond's price of a 0.2% decrease in its yield. Recalculate the bond's price on the basis of a 10.8% per annum yield and verify that the result is in agreement with your answer to (iii).

(10 Marks)

- 6 What is an option price? Explain the determinants of option prices. (10 Marks)
- 7 What do you mean by VaR? Describe the three approaches to determine VaR. (10 Marks)

SECTION - D
CASE STUDY – [Compulsory]

Mr. Balaji purchased a 3 months call option in the equity share of Hemanth Engineering Company. It has a 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 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:

- What is 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? (08 Marks)
- Determine the gain or loss to the call option bidder and seller if the share price at expiry is Rs.146. The call option premium is Rs.6. (04 Marks)
- Determine the price per share on expiry at which call option buyer and seller will be at breakeven point. (04 Marks)
- Determine the maximum gain to the call option buyer and seller. What is its probability? (04 Marks)

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