

# CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

20MBAFM402

## Fourth Semester MBA Degree Examination, Jan./Feb. 2023 Financial Derivatives

Time: 3 hrs.

Max. Marks:100

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

- 1 a. What is the difference between a Long forward position and a Short forward position? (03 Marks)  
b. At the end of one day, a clearing house member is long 100 contracts and the settlement price is Rs 50,000 per contract. The original margin is Rs 2,000 per contract. On the following day, the member becomes responsible for clearing an additional 20 long contracts, entered into a price of Rs 51,000 per contract. The settlement price at the end of this day is Rs 50,200. How much does the member have to add to its margin account with the exchange clearing house? (07 Marks)  
c. A Rs 100 million interest rate swap has a remaining life of 10 months. Under the terms of swap, six – months LIBOR is exchanged for 7% p.a (compounded semi annually). The average bid – offer rate being exchanged for six month LIBOR in swaps of all maturities is currently 5% p.a. with continuous compounding. The 6 – month LIBOR rate was 4.6% p.a. six months ago. What is the current value of swap to the party paying floating? What is the value to the party paying fixed? (10 Marks)
- 2 a. Distinguish between the terms Open interest and trading volume. (03 Marks)  
b. Explain the various factors affecting stock option prices. (07 Marks)  
c. Describe how would you calculate Cap flat volatilities from Cap spot volatilities and Cap spot volatilities from Cap flat volatilities. (10 Marks)
- 3 a. What is Swap rate? What is the relationship between Swap rate and Par yields? (03 Marks)  
b. Explain why a future contract can be used for either speculation or hedging. (07 Marks)  
c. A one year long forward contract on a non – dividend paying stock is entered into when the stock price is Rs 40 and the risk free rate of interest is 10% with continuous compounding.
  - What are the forward price and the initial value of forward contract?
  - Six months later, the price of the stock is Rs 45 and risk free rate of interest is still 10%, what are the forward price and the value of the forward contract. (10 Marks)
- 4 a. Explain why margins are required when clients write options, but not when they buy options. (03 Marks)  
b. “Companies with high credit risks are the ones that cannot access fixed rate markets directly. They are the companies that are most likely to be paying fixed and receiving floating in an interest rate swap”. Assume that this statement is true. Do you think it increases or decreases the risk of a financial institutions swap portfolio? Assume that companies are most likely to default when interest rates are high. (07 Marks)  
c. A stock price has an expected return of 16% and a volatility of 35%. The current price is Rs 38.
  - i) What is the probability that a European call option on the stock with an exercise price of Rs 40 and a maturity date is 6 months will be exercised.
  - ii) What is the probability that a European put option on the stock with the same exercise price and maturity will be exercised? (10 Marks)

- 5 a. What is a Mezzanine Tranche? (03 Marks)  
 b. Explain how an interest rate swap is mapped into a portfolio of zero coupon bonds with standard maturities for the purpose of VaR calculations. (07 Marks)  
 c. Suppose that the 6, 12, 18 and 24 months zero rates are 5%, 6%, 6.5% and 7% respectively. What is the par yield for two year? Also verify your result. (10 Marks)
- 6 a. What is the difference between a Strangle and Straddle? (03 Marks)  
 b. A future contract is used for hedging. Explain why the daily settlement of the contract can give rise to cash flow problems. (07 Marks)  
 c. A stock price is currently Rs 25. It is known that at the end of two months, it will be either Rs 23 or Rs 27. The risk free rate of interest is 10% with continuous compounding. Suppose  $S_T$  is the stock price at the end of two months, what is the value of a derivative that pays off  $S_T^2$  at this time. (10 Marks)
- 7 a. What is the meaning of Stop – limit order to sell at 20.30 with a limit of 20.10 means? (03 Marks)  
 b. The price of a non – dividend paying stock is Rs 19 and the price of a three month European call option on the stock with a strike price of Rs 20 is Re. 1. The risk free rate is 4% per annum. What is the price of a three month European put option with a strike price of Rs 20? (07 Marks)  
 c. A 4 month European call option on a dividend paying stock is currently selling at Rs 5. The stock price is Rs 60 and the dividend of Rs 0.80 is expected in one month. The risk free interest rate is 12% per annum for all maturities. What opportunities are there for an arbitrageur? (10 Marks)
- 8 A stock price is currently Rs 50. Over the each of the next two three months period, it is expected to go up by 6% or down by 5%. The risk free rate is 5% per annum with continuous compounding. What is the value of a six month European call option with a strike price of Rs 51?  
 a. What would be the value of 6 month put option with a strike price of Rs 51? (08 Marks)  
 b. Verify the European call and European Put option prices satisfy the Put – call parity. (08 Marks)  
 c. If the put option were American, would it ever be optimal to exercise it early at any of the nodes on the tree? (04 Marks)

\*\*\*\*\*