

PGDM (FS) – 2018-20 Batch - IV Trim End Term Exam

K.J. Somaiya Institute of Management Studies & Research  
Course : PGDM (Financial Services) – Batch: 2018-20 Trimester IV End Term Exam  
Sub : Derivatives and Risk Management

Date of Exam : 23/09/2019

Time : 3 hours

Marks : 50

Note : **Q. No. 1** is **compulsory**. Answer **ANY THREE** complete questions from the rest.

**Question 1**

**(20 Marks)**

- (a) The three-month interest rates in Switzerland and the United States are, respectively, 1% and 2% per annum with continuous compounding. The spot USDCHF rate is 1.0550, i.e. 1 USD = 1.055 CHF. The futures price for a contract deliverable in three months is 1.0544. What arbitrage opportunities does this create? Show step-wise computation of the arbitrage gain, if any. Consider spot and futures currency prices up to 4 decimal places. (10 marks)
- (b) An importer who has to pay in dollars for a consignment which will be received in mid-January is considering whether to use forward or futures contracts to hedge his exposure. Evaluate the merits and demerits of each hedging alternative. (10 marks)

**Question 2**

**(10 Marks)**

- (a) Akash took a long position in 5 contracts of Nifty Bank futures on August 1 at 28202.45. He squared up the position on August 8 at 27913.15. Show the daily mark-to-market on his long position from August 1 to August 8. The lot size is 20. (5 marks)

Date	1-Aug-2019	2-Aug-2019	5-Aug-2019	6-Aug-2019	7-Aug-2019	8-Aug-2019
<i>Futures price</i>	28499.30	28327.30	27795.75	28109.75	27748.45	28239.90

- (b) Explain the concept of 'basis'. Show how the strengthening or weakening of the basis improves or worsens the position of the party with the long hedge. (5 marks)

**Question 3**

**(10 Marks)**

- (a) ABC Ltd has entered into a 5-year interest rate swap with a financial institution under which ABC Ltd pays fixed 9.50% on a notional of Rs.100 crore and receives 6-month MIBOR. The swap is settled semi-annually by exchanging the difference between the fixed rate and the floating rate (6-month MIBOR) decided at the beginning of each settlement period. At the beginning of the fourth year

(after the settlement of cash flows for the 6<sup>th</sup> settlement period), ABC Ltd decides to terminate the swap as interest rates are expected to continuously decline over the next few quarters. The revised term structure of spot rates at the beginning of the fourth year is given below. Calculate the value of the swap for ABC Ltd on this date. (5 marks)

TTM	Spot rates
6-months	7.50%
12 months	7.80%
18 months	8.15%
24 months	8.40%

- (b) Show with examples how a company can transform its asset/liability position by entering into an interest rate swap. (5 marks)

**Question 4**  
**(10 Marks)**

- (a) On September 9, Nifty spot is trading at 11000. Call options on Nifty expiring on September 26 and with a strike price of 10900, 11000 and 11100 are traded at Rs.216.25, Rs.153.80 and Rs.99.50 respectively. A trader of options is of the view that Nifty will be quite range-bound till expiry. What kind of butterfly strategy is advised under these circumstances? Construct the strategy and show the pay-off assuming that on expiry Nifty closes either at (a) 10700 or (b) 10980 or (c) 11200. (5 marks)
- (b) State the main determinants of the price of an option and explain how each of these affects the option price. (5 marks)

**Question 5**  
**(10 Marks)**

- (a) BharatSteel's shares are traded at Rs.200. Compute the value of a one-year European call option on Bharat Steel shares at a strike price of Rs.210 using the binomial option pricing method and time steps of 6 months each. Assume that the share price can move up by 25% or down by 20% in each period and the risk-free interest rate is 8% p.a. continuously compounded. (5 marks)
- (b) Explain the principle of put-call parity and how it can be used for constructing synthetic options. (5 marks)

**Question 6** **(10 Marks)**

- (a) Today is September 10. A company wants to borrow Rs.100 crore on December

- 10 for a project which will take around six months. The Company anticipates an increase in interest rates till December. The bankers are quoting a 3/9 FRA at 8.25%-8.45%. How can the Company hedge against the rise in interest rates? Compute the effective cost of borrowing for the Company if the interest rate either rises to 9% or falls to 7.50% at the end of three months from today. (5 marks)
- (b) Suppose the current 1-month and 3-month MIBOR rates are 5.80% and 6.14%. Assuming that there are 31 days in the one-month period and 92 days in the three-month period what is the price of a new 1 X 3 FRA? (5 marks)