

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MBA – SEMESTER 4 – EXAMINATION – WINTER 2016**

**Subject Code: 2840202****Date: 25/10/2016****Subject Name: Risk Management (RM)****Time: 02.30 pm to 05.30 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q. 1 (a)****06**

Using the future contract to transfer price risk is called?

1. A. Speculating B. Hedging  
C. Diversifying D. Arbitrage

The put option has a strike price of Rs. 35 and the price of the underlying asset is Rs. 42 the option is?

2. A. In the money B. Out of the money  
C. At the money D. Near the money

Which of the following has a right to sell the asset at an underlying price?

3. A. The call B. The call writer  
C. The put buyer D. The put writer

The position by which the future contract is terminated by a contract that is equal and opposite to one that has initiated the position is called

4. A. Open interest B. Delivery  
C. Offset D. Terminated

Type of swaps in which fixed payments of interest are exchanged by two counterparties for floating payments of interest are called

5. A. float-fixed B. Interest rate swap  
C. Indexed swap D. Counter party swap

Agreement between two parties to exchange cash flows in future and cash flows are based on underlying instruments is classified as

6. A. Swaps B. Future  
C. Forward D. Option

**Q.1 (b)** Explain the following terms:

**04**

- 1) Intrinsic value of option
- 2) In the money options
- 3) Spread positions
- 4) Hedging

**Q.1 (c)** Explain what is meant by a perfect hedge. Does a perfect hedge always lead to a better outcome than an imperfect hedge? Explain your answer

**04**

Q.2

- (a) Distinguish between the open interest and trading volume with the help of example. 07
- (b) The BSE Senses index futures contract has a multiplier of 10. Assume that you enter into a BSE Index futures contract at 16,125 at 11 a.m. on March 1. Assume that the initial margin is 5% of the initial contract value (INR 8,062.50) and the maintenance margin is INR 5,000 at any given time. The following table shows the settlement prices on the days of trading between March 1 and March 12. You close out your position on March 12. Prepare a table showing the daily margin balances in your account. 07

Date	Settlement value of the Index
March 1	16,140
March 2	16,250
March 3	15,850
March 4	15,740
March 5	15,350
March 8	15,900
March 9	16,850
March 10	16,450
March 11	17,035
March 12	16,438

**OR**

- (b) On January 1, you buy 10,000 shares of Jet Airways at INR 1,000, and you are concerned about a decrease in the price of Jet Airways shares. There is a March futures contract available. The risk-free rate is 6%, and Jet Airways is expected to pay a dividend of INR 90 on January 31. The contract in March matures on March 28. 07
- Calculate the futures price on January 1.
  - On March 28, Jet Airways shares are selling at INR 976. If you hedge your portfolio with Jet Airways futures and sell your

Q.3

- (a) What is the rationale for introducing currency future contracts? Explain the application of the principle of covered interest rate arbitrage with formulae in pricing currency futures. 07
- (b) A State Bank share is selling for INR 2,500 on January 1. It has a put option with maturity on March 31 with an exercise price of INR 2,700. This option is selling for INR 160. Draw a table and a diagram showing the terminal value of this option as well as the gains from buying this option for possible stock prices of INR 2,300 to INR 3,000. 07

**OR**

Q.3

- (a) Explain Binomial option pricing model in details.
- (b) A State Bank share is selling at INR 2,500 on January 1. It has a call option with maturity on March 31 with an exercise price of INR 2,700. This option is selling for INR 85.
- On February 14, the State Bank share price is INR 2,540. What is its intrinsic value? Is the option in-the-money?

Would you exercise this option on February 14? Explain.  
 ii) On February 14, the State Bank share price is INR 2,620.  
 What is its intrinsic value? Is the option in-the-money?  
 Would you exercise this option on February 14? Explain.

**Q.4** (a) Explain with example the advantage of writing a covered call over writing a naked call? **07**

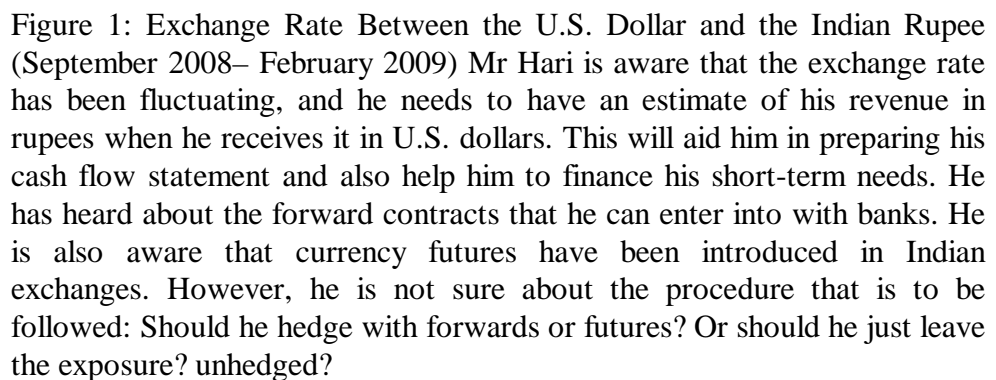
(b) Assume that a security is selling at INR 400 and call and put options are available on the stock with a maturity of 90 days and an exercise price of INR 420. The call is selling at INR 6, and the risk-free rate is 8% per annum. According to put-call parity, what should the put sell for? Assume that the stock will pay a dividend of INR 5 per share after 30 days. **07**

**OR**

**Q.4** (a) What is meant by:  
 i) Delta hedging  
 ii) Gamma hedging  
 iii) Vega hedging **07**

(b) The contract size of Allahabad Bank options is 2,450. Allahabad Bank shares are selling at INR 88 on March 1. Call options and put options are available with expiry on April 29 and an exercise price of INR 90. It is expected that the Allahabad Bank share price will be either INR 95 or INR 80. The risk-free rate is 8%. By using the binomial options pricing model, calculate the call option price on March 1. **07**

**Q.5** Ram Hosiery is a manufacturer and exporter of undergarments and T-shirts. Its manufacturing facilities are located in Tiruppur, Tamil Nadu. Its operations were started in the year 2006, and in the past three years, its sales have increased from INR 8 million to INR 12 billion. Of this, 20% of the sales are from Europe and 60% of the sales are from the USA. The other 20% are from Asian countries. The European customers are invoiced in euros, while the customers in the USA and Asia are invoiced in U.S. dollars. Since 80% of the total sales are invoiced in U.S. dollars, Mr Hari, the Chief Executive Officer of Ram Hosiery, is concerned about the movement of the Indian rupee against the U.S. dollar. His assistant has looked at the exchange rate between the U.S. dollar and the Indian rupee for the period from September 2008 to February 2009 and found that it has been highly volatile. The exchange rate movements are shown below: **14**



**OR**

Sairam Metals are traders in metals. One of the products they trade in is steel plates. They buy steel plates for inventory as well as on order. Usually they buy steel plates on the first of every month and the usual monthly demand is 320 MTMT. If they get an order for steel, they require about three weeks to fulfil that order. They buy the steel plates at the prevailing market price and sell them at a markup of 15 to 20 per cent. Since the price of steel plates is dependent on steel prices and the price of steel is very volatile in the world market, Sairam Metals face a problem with regard to the projection of their cash outflows every month when they buy the steel plates.

Sairam, the owner–manager of Sairam Metals has heard that one way to streamline the cash flow would be to enter into hedging activity using futures markets. Since Sairam is just a trader, he is not sure what hedging involves. However, he decides to see what futures contracts are available and finds that there are three futures contracts available in the Multi Commodity Exchange of India (MCX India): futures on steel ingots, steel flats, and sponge iron.

The futures on steel ingots have a contract size of 15 MT, and the delivery date is on the 15<sup>th</sup> of the calendar month. Contracts are available with a maturity of three months from the launch date, and they are launched on the 16<sup>th</sup> of each calendar month. The current futures price on steel ingots is INR 24,170 per MT, with expiry next month.

The futures on steel flats have a contract size of 25 MT, and the delivery date is 15<sup>th</sup> of the calendar month. Contracts are available with a maturity of four months from the launch date, and they are launched on the 16<sup>th</sup> of each calendar month. The current futures price on steel flats is INR 30,880 per MT, with expiry next month.

The futures on sponge iron have a contract size of 15 MT, and the delivery date is 15<sup>th</sup> of the calendar month. Contracts are available with a maturity of four months from the launch date, and they are launched on the 16<sup>th</sup> of each calendar month. The current futures price on sponge iron is INR 16,110 per MT, with expiry next month.

Since Sairam is not aware of how to go about hedging, he has contacted you to answer some questions he has regarding hedging. You are required to help him come up with a hedging strategy. The questions to be addressed are:

1. I have been told that there are two types of hedges: long hedges and short hedges. What do they mean? Which one is appropriate for Sairam metals?
2. There are three different iron and steel contracts available in the market. Which of these contracts is the best for Sairam Metals?
3. Our usual practice is to buy steel plates in the market on the 1<sup>st</sup> day of every month. If I use futures to hedge, will this strategy work, or should I change the timing of purchase?
4. Based on these questions, you decide to find the correlation between the market price of steel plates and the market price of the futures on steel flats, steel ingots, and sponge iron. The standard deviation of the market price of steel plates, futures price on steel flats, futures price on steel ingots, and futures price on sponge iron is INR 450, INR 380, INR 520, and INR 420, respectively. The correlation between the price of steel plates and the futures price of steel flats is 0.87, that between the price of steel plates and the futures price of steel ingots is 0.82, and that between the price of steel plates and the futures price of sponge iron is 0.65. Which of these contracts should Sairam use for hedging?
5. As his monthly demand is 320 MT a month, what will be his strategy of hedging? That is, how many contracts should he enter into?

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