



Name :

Roll No. :

Invigilator's Signature :

**CS/MBA (NEW)/SEM-4 (FT)/FM-406/2010
2010**

DERIVATIVES & RISK MANAGEMENT

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Put option
 - a) gives the owner the right to buy an asset or any security to someone else
 - b) gives the owner the right to buy an asset
 - c) gives the owner the right to buy but not an obligation
 - d) gives the owner a right to buy but not an obligation.
- ii) The call option price is higher, when
 - a) the striking price is higher than the stock price
 - b) the striking price is lower than the stock price
 - c) the option period is shorter
 - d) the option period is longer and the striking price is lower.



- iii) The put option buyer gains
 - a) in the Bullish market
 - b) in the Bearish market
 - c) in the stable market
 - d) when the strike price is lower than stock price.

- iv) The Black-Scholes Option price in theory is based on the following assumption that,
 - a) this stock price movement is taken to be random
 - b) the stock pays regular dividends
 - c) there is cyclical change in interest rate
 - d) the call option can be exercised any time during its life period.

- v) Which of the following is not an assumption in a cost and carry model of futures pricing ?
 - a) No seasonal demand and supply in the underlying asset
 - b) The asset is carriable
 - c) The underlying asset cannot be sold short
 - d) No transaction cost.



- vi) If a trader has a mildly neutral to Bearish perspective, he should
- a) write deep out-of-the-money call option
 - b) write deep out-of-the-money put option
 - c) buy deep in-the-money call option
 - d) buy deep in-the-money put option.
- vii) Who are the player(s) in the future market ?
- a) Speculators
 - b) Hedgers
 - c) Arbitrageurs
 - d) All are them.
- viii) Hedging a long position in jet fuel by a short position in crude oil, is an example of
- a) long hedge
 - b) short hedge
 - c) cross hedge
 - d) none of these.
- ix) Which of the following is true ?
- a) Delta for all the Bullish position is positive
 - b) Delta for all the Bullish position is negative
 - c) Delta for all the long position is positive
 - d) None of these.
- x) A trader buys, June expiry call options each at a strike price of Rs. 200 and Rs. 220 respectively. Simultaneously, he writes 2, June expiry call options at a strike price of Rs. 210. This strategy is called
- a) Butterfly spread
 - b) Bull spread
 - c) Bear spread
 - d) Strip.



- xi) Futures prices and spot market prices
- a) are usually equal
 - b) are closely monitored and controlled by government regulators
 - c) are affected by arbitrageurs who bid on both, thus affecting supply and demand
 - d) get farther apart as the delivery date nears.
- xii) Gains and losses on future positions are settled
- a) by signing promissory notes
 - b) each day after the close of trading
 - c) within five business days
 - d) through dmat account instacheques.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the different types of Business Risks ?
3. Who are the participants in Derivative Market ?
4. How does a Future Contract work ?
5. Define Long and Short positions.
6. Describe the features of Interest Rate Swap.



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) A highly diversified portfolio is currently worth Rs. 10 lakh and has a beta of 1.0. The BSE sensex is currently at 4000. Show how (hypothetical) put option on the BSE sensex with a strike price of Rs. 3,800 can be used to provide portfolio insurance. Assume that each option is for 10 times the value of the index.
- b) A wheat farmer in order to protect himself from price fluctuations sells 15 futures contracts of 5000 bushels each at the rate of Rs. 9.00 per bushel. At the time of harvest which is five months from now, the basis is $- 0.15$ and the price of wheat per bushel is Rs. 9.50. Did the farmer gain or lose and by how much amount ?
- c) The firm is considering to hedge its exposure by taking position in futures of either Euro or Pounds as both the currencies are related to DKK in a similar manner.

The spot rates as on September 15th are —

$$\$/\pounds = 1.5435,$$

$$\$/C = 1.1112.$$

And the December *f* futures are trading at $\$/\pounds$ 1.5559.

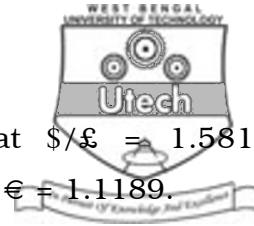
The December \pounds future are trading at $\$/\pounds$ 1.1008 on December 15th, the spot rates are as —

$$DKK/\$ = 6.4921$$

$$\$/\pounds = 1.5817$$

$$\$/\pounds = 1.1192$$

In the futures market.



December f futures are trading at $\$/\text{£} = 1.5814$
December € futures are trading at $\$/\text{€} = 1.1189$.

You are required to compute the firm's gain and losses in both the hedging strategies.

(Standard size of Euro futures are 1,25,000 and the size of British Pounds is 62,500). 5 + 5 + 5

8. What do you understand by Volatility ? Explain Implied Volatility and Historical Volatility. What is VaR ?

3 + 4 + 8

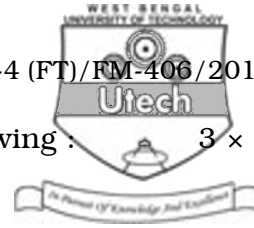
9. a) Discuss how various hedging strategies are applied to manage futures price risk.

b) Assume that a market-capitalization weighted index contains only three stocks A, B and C as given below. The current value of the index is 1056.

<i>Company</i>	<i>Share Price</i> (Rs.)	<i>Market Capitalization</i> (Rs. in crores)
A	120	12
B	50	30
C	80	24

Calculate the price of a futures contract with expiration in 60 days on this index if it is shown that 25 days from now, Company A would pay a dividend of Rs. 8 per share. Take the risk free rate of interest to be 15% p.a. Assume the lot size to be 200 units.

10 + 5



10. Write short notes on any *three* of the following : 3 × 5

- a) Option Vega
- b) Basel II
- c) Rho and Phi
- d) Binomial Option-Pricing Model
- e) Arbitrage.

11. Read the case carefully and answer the following questions :

- a) Construct the profit diagrams associated with the following investment strategies and comment on the maximum profit/loss in each one of them.
 - i) Selling a March 120 call
 - ii) Buying a December 140 call.
- b) Are the June 20×2 put premiums in line with what should have been the put premium using the put-call parity relationship ? If the quoted put premiums are different what strategy would be recommended for exploiting the anomaly ? State your assumptions if any.

Recently, SEBI has allowed mutual funds to trade into derivatives subject that the same is done for hedging and portfolio balancing and not for speculative purposes. The management of ABC Mutual Fund Ltd. is very excited about this development and thinks that this will be a very good way to hedge the fluctuations in the market which in the past have subjected their portfolio to heavy losses. But as this is a new development and no one can surely guarantee success as markets in India are more sentiment based than technically organized, the management of the fund would like to go slow and experiment first.



They have narrowed down to one share of XYZ Electronic Ltd. from the A group of the BSE. The stock currently trades at Rs. 150 and had paid no dividend in the current year. The beta of the stock is 1.4. It has a volatility of 25%.

The following are the option premiums of XYZ Electronic Ltd. and different strike prices as on

Stock Price Rs. 200	Calls (Rs.)			Puts (Rs.)		
	Dec. 31 20 × 1	Mar. 31 20 × 2	Jun. 30 20 × 2	Dec. 31 20 × 1	Mar. 31 20 × 2	Jun. 30 20 × 2
120	31	42	51			
130	25	30	34	—		
140	18	22	28	1	4	
150	6	11	16	4	7	
160	4	8	12	9	14	21
170	1	5	9	—	19	24

12. What is Interest Rate Swap ? How does it differ from a forward contract ? Discuss in brief the emerging issues in Indian derivative market.

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