

Total No. of printed pages = 7

BA 13240F2

Roll No. of candidate

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2017

MBA 4th Semester End-Term Examination

**FINANCIAL ENGINEERING AND
DERIVATIVES MANAGEMENT**

Full Marks-100 Pass Marks-35 Time-Three hours

The figures in the margin indicate full marks
for the questions.

GROUP - A

Answer any *six* questions. $6 \times 5 = 30$

1. Differentiate between hedging, speculation and
arbitrage. 5
2. Compare between forward and futures contracts. 5
3. "For an asset where futures prices are usually less
than spot prices, long hedges are likely to be
particularly attractive." Elaborate. 5

[Turn over

4. Explain what is meant by a perfect hedge. Does a perfect hedge always lead to a better outcome than an imperfect hedge? Elaborate. 5
5. 'The early exercise of an American put is a trade-off between the time value of money and the insurance value of a put?' Explain. 5
6. What do you mean by Swaps? How can Swaps be used to mitigate risk? 5
7. The treasurer of International Exports Limited is trying to choose between options and forward contracts to hedge the company's foreign exchange risk. Discuss the advantages and disadvantages of each. 5
8. Distinguish between Caps, Floors and Collars. 5

GROUP - B

Answer any four questions. $4 \times 10 = 40$

9. (a) "If the minimum variance hedge ratio is calculated as 1.0, the hedge must be perfect." Is this statement true? Justify. 3

- (b) A company has a \$20 million portfolio with beta of 1.2. It would like to use futures contracts on the S&P 500 to hedge its risk. The index futures is currently standing at 1080 and each contract is for delivery of \$250 times the index. 7

- (i) What is the hedge that minimizes risk?
- (ii) What should the company do if it wants to reduce the beta of the portfolio to 0.6?

10. (a) Explain carefully the meaning of the terms convenience yield and cost of carry. 3

- (b) A 1-year long forward contract on a non-dividend-paying stock is entered into when the stock price is Rs. 250 and the risk-free rate is 6% per annum with continuous compounding. $f_0 = S_0 e^{rt}$

- (i) What are the forward price and the initial value of the forward contract?
- (ii) Six month later the price of the stock is Rs. 267 and the risk-free interest is still 6%. Does the forward price change? Also, determine the value of the forward contract. 7

11. (a) Explain why the arguments leading to put-call parity for European options cannot be used to give a similar result for American options. 5

(b) The price of a three-month European call option having a strike price of \$30 is \$3. The underlying stock price is \$31. If the risk-free interest rate is 10% per annum, determine the price of a European put option with the same strike price and time left for maturity. 5

12. (a) Explain carefully why the futures price of gold can be calculated from its spot price and other observable variables whereas the futures price of copper cannot be calculated. 3

(b) The spot price of silver is \$10 per ounce. The storage costs are \$0.24 per ounce per year payable quarterly in advance. Assuming that interest rates are 10 per cent per annum for all maturities, calculate the futures price of silver for delivery in 9 months. 7

13. Consider a 2-year American put with a strike price of \$52 on a stock whose current price is \$50. Over the next two one-year time period (i.e. two time steps of one year each), in each time step the stock price is expected to move up by 20% or down by 20%. The risk-free interest rate is 5% per annum with continuous compounding. Determine the value of the option. Also find out whether there exists a possibility of early exercise of the option. 10

14. (a) Why is it necessary to develop new financial products? 3

(b) Explain the process of designing and testing of new financial product. 7

GROUP - C

Answer any *two* questions. $2 \times 15 = 30$

15. (a) Explain what a Swap Rate is. 2

(b) Explain why a bank is subject to credit risk when it enters into two offsetting swap contracts. 3

- (c) Companies A and B have been offered the following rates per annum on a Rs. 10 million loan for 5 years —

Companies	Fixed rates	Floating rates
A	12.0%	MIBOR + 0.1%
B	14.5%	MIBOR + 0.9%

Company A requires a floating rate loan and Company B requires a fixed interest rate loan. Design a swap that will net a bank, acting as an intermediary, 0.1% per annum and that will appear equally attractive to both the companies.

10

16. (a) Explain the principle of risk-neutral valuation.

3

(b) What is the price of

- (i) a European call option and
 (ii) a European put option when the stock price 6 months from the expiration of the option is \$42, the exercise price of the option is \$40, the risk-free interest rate is 10% per annum and the volatility is 20% per annum ?

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(6)

17. Write notes on any *three* :

3×5=15

(a) Basis Risk

(b) Commodities Market in India

(c) Day Count and Quotation Conventions

(d) Currency Futures

(e) American vs. European Options.

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(7)

10
100

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