

PGDM/IB, 2017-19

Derivatives and Risk Management

DM-414/IB-408

Trimester – IV, End-Term Examination: September 2018

Time allowed: 2 Hrs 30 Min

Max

Marks: 50

Roll No: _____

instruction: Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means**. All other instructions on the reverse of Admit Card should be followed meticulously. Please carry a non-programmable calculator.

Section: A (15 Marks).

Attempt 3 out of 5 questions, each question carries 5 marks.

1. Explain who bears default risk in a forward contract.
2. What is the difference between value and payoff in the context of derivative securities?
3. Suppose you are holding a stock position, and wish to hedge it. What forward contract would you use, a long or a short? What option contract might you use? Compare the forward versus the option on the following three criteria: (a) uncertainty of hedged position cashflow, (b) Up-front cashflow and (c) maturity-time regret.
4. The following are one-year put option prices: the put at strike 90 is trading at Rs. 12, and the put at strike 80 is trading at Rs. 2.50. The rate of interest (continuously compounded) for one year is 10%. Show how you would construct an arbitrage strategy in this market.
5. Identify the main institutional differences between futures contracts and forward contracts.

Sec B

(Answer any two questions out of five. Each question carries ten marks)

6. A security is currently trading at Rs. 97. It will pay a coupon of Rs. 5 in two months. No other payouts are expected in the next six months.

(a) If the term structure is at 12%, what should the be forward price on the security for delivery in six months?

(b) If the actual forward price is Rs. 92, explain how an arbitrage may be created. (5+5)

7. a) Tata Steel is currently trading at Rs. 26. You expect that prices will increase but not rise above Rs. 28 per share. Options on Microsoft with strikes of Rs. 22.50, Rs. 25.00, Rs. 27.50, and Rs. 30 are available. What options portfolio would you construct from these options to incorporate your views?

b) Suppose your view in the previous question were instead that Tata Steel's shares will fall but a fall below Rs. 22 is unlikely. Now what strategy will you use?

c) Compute the gross payoffs for the following two portfolios in separate tables:

- Calls (strikes in parentheses): $C(90) - 2C(100) + C(110)$.
- Puts (strikes in parentheses): $P(90) - 2P(100) + P(110)$.

What is the relationship between the two portfolios? Can you explain why? (4+3+3)

8. Companies X and Y have been offered the following rates per annum on a Rs. 10000000 loan for 5 years

	Fixed Rate	Floating Rate
Company X	12%	MIBOR + 0.1%
Company Y	14.5%	MIBOR + 0.9%

Company X requires a floating rate loan and company Y requires a fixed rate loan. Design a swap that will net a bank, acting as intermediary, 0.1% per annum and that will appear equally attractive to both companies. (10)

Sec C (15 marks)

9.

a) Draw a diagram showing the variation of an investor's profit and loss with the terminal stock price for a portfolio consisting of:

- i) One share and a short position in one call option
- ii) Two shares and a short position in one call option
- iii) One share and a short position in two call options
- iv) One share and a short position in four call options. (1.5 marks x 4)

b) A stock price is currently Rs. 60. It is known that at the end of 1 month, it will be either Rs. 50 or Rs. 70. The risk free rate is 8% per annum with continuous compounding. What is the value of a 1-month European call option with a strike price of Rs. 58? (5 marks)

c) "A box spread comprises four options. Two can be combined to create a long forward position and two can be combined to create a short forward position". Explain this statement. (4 marks)