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Paper Code : FM 404 FINANCIAL DERIVATIVES

UPID : 004691

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following : [1 x 10 = 10]

(I) When and how a European option could be exercised?

(II) We have a European Call option to buy a stock for R50 and tenure is 3 months. The underlying is a stock which is available today at market price =50 and it is known that in three months stock price may fluctuate by ±20%. At when stock price becomes =50 1.20= 60, what will be the intrinsic value of the option at?

(III) With options contracts this spread can be created by buying one put with a low strike price, another with a high strike price and sells two puts with an intermediate strike price. What is the name of this spread?

(IV) In options market when long positions in two put options are added with long position in one call, with both call & puts have same strike price and expiration date, then what is the name of the strategy?

(V) These players use derivatives to reduce the risk that they face from potential future movements in a market variable. What are these class of players called?

(VI) Consider an institution has written a European call option with Strike Price with one unit of stock as underlying. To hedge this position how could you make Stop Loss strategy?

(VII) How many types of participants are there in an American option market on a non-dividend paying stock?

(VIII) What do you mean by equivalent position to a protective put option?

(IX) In a derivative market what does a long position refer?

(X) When the gamma of an option writer's position is large and negative and the delta is zero then what will be the gain or loss of the option writer?

(XI) With respect to option contract with stock as underlying what do you mean by "taking a protective put strategy"?

(XII) Consider an exchange-traded call option contract to buy 500 shares with a strike price of R40 and maturity in four months. If there is a 10% stock dividend declared then what will be the terms of the option contract?

Group-B (Short Answer Type Question)

Answer any three of the following : [5 x 3 = 15]

2. What do you mean by Credit risk? With respect to derivative contracts how does credit risk arise? [5]
3. What is the difference between a long forward position and a short forward position? [5]
4. Define a swap contract. What is the main difference between an Interest rate Swap contracts and Currency Swap contracts? [5]
5. Explain the principle of risk neutral valuation [5]
6. What is meant by LIBOR and LIBID? [5]

Group-C (Long Answer Type Question)

Answer any three of the following : [15 x 3 = 45]

7. The Black-Scholes-Merton price of an out-of-the-money call option with an exercise price of $40 is $4. A trader who has written the option plans to use a stop-loss strategy. The trader's plan is to buy at $40.10 and to sell at $39.90. Estimate the expected number of times the stock will be bought or sold. [15]
8. Suppose that a stock price is currently $20 and that a call option with an exercise price of $25 is created synthetically using a continually changing position in the stock. Consider the following two scenarios: [7+8]
   a) Stock price increases steadily from $20 to $35 during the life of the option.
   b) Stock price oscillates wildly, ending up at $35.
   Which scenario would make the synthetically created option more expensive? Explain your answer.
9. What is the delta of a short position in 1,000 European call options on silver futures? The options mature in eight months, and the futures contract underlying the option matures in nine months. The current nine-month futures price is $8 per ounce, the exercise price of the options is $8, the risk-free interest rate is 12% per annum, and the volatility of silver futures prices is 18% per annum. [15]

10. A currency is currently worth $0.80 and has a volatility of 12%. The domestic and foreign risk-free interest rates are 6% and 8%, respectively. Use a two-step binomial tree to value a) a European four-month call option with a strike price of $0.79 and b) an American four-month call option with the same strike price [7+8]

11. Companies A and B have been offered the following rates per annum on a R20mmillion five year loan [10+5]

	Fixed Rate	Floating Rate
Company A	12.0%	LIBOR+0.1%
Company B	13.4%	LIBOR+0.6%

Company A requires a floating rate loan; Company B requires a fixed rate loan; Design a swap that will net a bank, acting as intermediary, 0.1% per annum and appear to be equally attractive to both companies. Prove the correctness of your design

*** END OF PAPER ***