**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**FOURTH TRIMESTER (Batch 2020-22)**

**END TERM EXAMINATION, OCT-2021**

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| Course Name | **Financial Derivatives and Risk Management** | Course Code | **FIN402** |
| Max. Time | **2 hours** | Max. Marks | **40** |

**INSTRUCTIONS:**

1) Answer all the questions. A standard normal variate table and certain formula have been appended below for your ready reference. The notations and letters used in the formula sheet have the same meaning as used in text book and class room lecture, as such, no further explanation is required.

2) Laptop computer, books, any written note, paper, and mobile phones are strictly prohibited. You can carry only pen, pencil, eraser and your own scientific calculator in the examination hall. Exchange of calculator is strictly prohibited.

3) All questions carry adequate information to answer them appropriately. Hence don’t disturb the invigilator by asking any question.

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**Questions.1 (3+3+4= 10 Marks)**

(a) What is a lower bound for the price of a 6 month European call option on a non dividend paying stock when the stock price is Rs.80, the strike price is Rs.75, risk free interest = 10% PA ?

(b) What is a lower bound for the price of a 2 month European put option on a non dividend paying stock when the stock price is Rs. 58, the strike price is Rs.65, risk free interest = 5% PA ?

(c) A one month European put option on a non-dividend paying stock is currently selling for Rs.2.50. The stock price is Rs.47, the strike price is Rs.50 and the risk free interest rate is 6% PA. Explain what opportunities are there for arbitrageur ?

**Questions.2 (4+3+3= 10 Marks)**

(a) Explain why it is suboptimal to exercise American call option on a non-dividend paying stock before the expiry ? Argue formally.

(b) Under what circumstances American put option can be exercised early ?

(c) Show with example how covered call option gives insurance against rise in share price to a call writer ?

**Questions.3 (5+2+3 =10 Marks)**

(a) What is the price of a European put option on a non-dividend paying stock when the stock price is Rs.69, the strike price is Rs.70, the risk free interest rate 5% PA and the volatility is 35% PA and the time to maturity is 6 months ?

(b) Show that the BSM for a call option gives a price that tends to max (S0 -K, 0) as T 🡪0.

(c) A stock price is currently Rs.40. It is known that at the end of 1 month it will be either Rs. 42 or Rs.38. The risk free rate is 8% PA with continuous compounding. What is the value of a one month European call option with a strike of Rs.39 ?

**Questions.4 (6+4 = 10 Marks)**

(a) Company X and Y have been offered the following rates PA on a Rs.150 crore 5 year loan :

|  |  |  |
| --- | --- | --- |
|  | Fixed rate | Floating rate |
| Company X | 5% | Libor +0.1% |
| Company Y | 6.4% | Libor +0.6% |

Company X requires a floating rate loan, company Y requires a fixed rate loan Design a swap that will net a bank, acting as intermediary, 0.1% PA.

(b) Show with example that - Bear spread with call strategy ‘protects the investor both from upside and downside risk’.

