**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**FIFTH TRIMESTER (Batch 2019-21)**

**END TERM EXAMINATION, JAN-2021**

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

**INSTRUCTIONS:**

All the questions are compulsory.

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**Question.1 (10 Marks)**

A fund manager has a portfolio worth Rs. 50 million with a beta of 0.87. The manager is concerned about the performance of the market over the next 2 months and plans to use 3 month future contract on the NSE to hedge the risk. The current level of the index is 4200, one contract is 200 times the index, the risk free rate is 6 % per annum and the dividend yield on the index is 4% per annum. The current 3 month future price is Rs.4270.

1. What position should the fund manager take to eliminate all exposure to the market over the next 2 years?
2. Calculate the effect of your strategy on the fund manager’s return if the level of market in 2 months is Rs. 4000, Rs. 4100 and Rs. 4300. Assume that the 1-month futures is 0.25 % higher than the index level at this time.

**Question.2**

Deepak, advisor, has a client who believes the common stock price of KEI Industries could move substantially in either direction in reaction to an expected court decision involving the company. The current market price is Rs.58 per share. The client currently owns no KEI shares but asks Deepak for advice about implementing a strangle strategy to capitalize on the possible stock price movement. Deepak gathers the KEI option pricing data shown in the following table: KEI Industries Option Pricing Data

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Call Option** | **Put Option** |
| Option Price | Rs.5 | Rs.4 |
| Strike Price | Rs.60 | Rs.55 |
| Time to Expiration | 3 months | 3 months |

1. Recommend whether Deepak should choose a long strangle strategy or a short strangle strategy to achieve the client’s objective. Justify your recommendation with one reason. **(2 Marks)**
2. Indicate, at expiration for the appropriate strangle strategy in Part a, the

(i). Maximum possible loss **(2 Marks)**

(ii). Maximum possible gain **(3 Marks)**

(iii). Break-even Price **(3 Marks)**

**Question.3 (10 Marks)**

Company P wants a loan of Rs.10 million. Its bankers have told the company that a fixed interest loan can be sanctioned at 10% interest, while a floating interest rate can be sanctioned at the LIBOR + 1 %. Another company Q is also looking for a Rs.10 million loan. Its bankers have given it a quote of 11 % for a fixed interest loan and LIBOR + 3 % for a floating interest loan. Explain how the swap can be arranged through financial intermediary which charges 20 basis points.

**Question.4 (10 Marks)**

The market price of a security can be modelled by assuming that it will either increase by 12% or decrease by 15% each month, independently of the price movement in other months. No dividends are payable during the next two months. The continuously-compounded risk-free rate of interest is 8% per annum. The current market price of the security is Rs. 254.

1. Use the binomial model to calculate the value of a two-month European put option on the security with a strike price of Rs. 250.
2. Calculate the value of a two-month American put option on the same security with the same strike price.
3. Calculate the value of a two-month European call option on the same security with the same strike price.
4. Calculate the value of a two-month American call option on the same security with the same strike price.
5. Verify numerically that the put-call parity relationship holds in case of European options.
6. Verify numerically that the put-call parity relationship holds in case of American options.