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M.P. Birla Institute of Management LIBRARY

IV Semester M.B.A. (Day & Evening) Degree Examination, November/December - 2025

MANAGEMENT

Derivatives and Risk Management

(CBCS Scheme 2019 Onwards)

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Scientific calculators are allowed.

SECTION - A

Answer any Five questions from the following. Each question carries 5 marks.

(5×5=25)

1. What is meant by risk in a business context? Discuss the different types of risks that a business may face, providing examples for each.
2. Explain the SEBI guidelines on derivative market.
3. An investor buys 5 future contract on Gold Ten Futures at MCX. Each contract is for 10 grams of Gold. Price quotation is INR 1,15,510 per 10 grams. Initial margin is set at 4 percent and maintenance margin is 90 percent of initial margin. Find out gain/loss on daily basis for long contract of gold. Prices for next 5 days are INR 1,15,580, INR 1,15,405, INR 1,15,310, INR 1,15,480 and INR 1,15,540. Indicate the position of margin account balance.
4. A 4 months contract on Raw Coffee, Karnataka is available at rate of INR 25,000/bag. If the storage cost is 2 % of selling price and the continuously compounded risk-free rate of return is 9 % per annum.
   a) What is the forward rate?
   b) Find out the value if spot INR 26,250 at the end of two months.
5. An option contract is given below with following details:

   Exercise Price : INR 33

   Current market price : INR 30

   Option is call

   Premium : INR 5 per share

   Assume the price on date of expiration happens to be INR 25, 30, 35, 40, 45, and INR 50. Calculate the Net pay off under each case for call options assuming long position of investor. Also work out net pay off diagram.

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6. Assume that a NIFTY SMLCAP 250 market capitalisation weighted index taken of 5 stocks. Currently the index stands at 17500. The continuously compounded risk free rate of interest is 8 percent per annum. Size of the contract is 300 units . Obtain the price of a future contract with expiration in 115 days on this index having reference to the following additional information.

Company	Share Price	Market Capitalisation(INR in Crore)
A	22	110
B	85	170
C	124	372
D	54	216
E	25	200

Calculate:

a) Dividend of INR 6 per share expected on share B, 20 days from now

b) Dividend of INR 3 per share expected on share E, 28 days from now

7. A straddle involves buying a long call and a long put at the same exercise price and for the same tenure. A buyer of a straddle buys both the call and the put. Compute straddle strategy by using the below information

Strike price = INR 100

Call Premium = INR 5

Put Premium = INR 4

Initial investment = INR 9

If at the end of stock price turns out to be in between INR 87 to INR 113.

SECTION - B

Answer any Three questions from the following. Each question carries 10 marks. **(3×10=30)**

8. "Options are instruments with unique risk return profile"-Discuss.

9. A 12-month future contract is available at rate of INR 477. The underlying asset pays an income of INR 13 at end of 4th, 7th and 9th months. If interest rate is 9 percent per annum compounded quarterly.

a) What is fair future price?

b) If at end of 5th month if asset is quoted at INR 450. What is future position?

c) At end of 7th month at INR 499. What is forward long and forward short position?

d) If delivery price is at the time of entering contract is quoted at INR 530, is there any arbitrage possibility, if so, show the action you will take in order to take advantages of the position.

10. ABC stock is currently trading at INR 340, and the 91 days T-Bill rate is 12 percent per annum continuously compounded risk free rate. Using Binomial Options Pricing Model, calculate the fair value of a Call premium and a Put premium for a contract with a strike price of INR 370 expiring in the next 3 months. The probability of the spot price moving up is to INR 391 or falling to INR 306. What would be the Option Delta under Binomial Model?

11. On January 2025 investor as portfolio consisting of 8 securities as shown below:

Company	Price	No.of shares	Beta
A	29	400	0.59
B	320	800	1.32
C	660	100	0.86
D	285	300	0.35
E	275	400	1.16
F	575	750	1.24
G	150	300	1.05
H	230	900	0.76

The Cost of capital for the investor is given to the investor to be 15%. The investor fears a fall in the prices of the shares in the near future. Accordingly, he approaches you for advice, you are required to ;

a) You are required to state the option available to investor to protect his portfolio,
b) Calculate Beta of portfolio
c) Calculate theoretical value of future contract according to investor, contract expiring i) February, ii) March
d) Calculate no. of units of Nifty 50 that would have to sell if the desire to hedge until march
   i) His total portfolio, ii) 90% of its portfolio
e) Determine no. of future contract the investor should trade if he desire to reduce beta to 0.9
   i) Current Nifty value is 25,000
   ii) Nifty future can be traded in 200 units only
   iii) February futures are currently quoted at 23,510
   iv) March futures are currently quoted at 25,510.

SECTION - C

12. (Compulsory) Case Study: (1×15=15)

The current ABC stock price of being INR 206. A European call option with an exercise price of INR 220, time to expiration is 47 days with a continuously compounded rate of return is12 percent per annum and the standard deviation of the stock is 0.26.

What would be the various measures of sensitivity obtained by differentiating the Black and Scholes formulation for call and put options with respect to various input parameters include the values of options Greeks. From the following information given below, you are required to obtain and interpret

a) The Call and Put option values and

b) The values of options Greeks namely; Delta, Gamma, Theta, Rho and Vega.