

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MBA– SEMESTER –III-EXAMINATION – WINTER-2023**

**Subject Code:4539222****Date: 06-12-2023****Subject Name: Financial Derivatives****Time:10:30 AM TO 1:30 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

- Q.1 Explain the following terms. 14
- a) Cash and carry arbitrage
  - b) Imperfect hedge
  - c) Intrinsic value and time value
  - d) Theta
  - e) Forward contract
  - f) Tick size
  - g) M2M margin
- Q.2 (a) Calculate the forward price on a 3-month contract on a share, expected to pay no dividend during the period, which is available at Rs. 75, given that the risk-free rate of interest to be 8% p.a. compounded continuously. 7
- Q.2 (b) Describe the uses of derivatives to manage various types of risks. 7
- OR
- Q.2 (b) Explain the difference between futures and forwards. 7
- Q.3 (a) Explain graphically money ness of a put option from the point of view of a holder and a writer. Make necessary assumptions. 7
- Q.3(b) A stock is trading at Rs.1240 on October 1st. Call options with different exercise dates and exercise prices are available, as shown in the following table- 7

Expiry Date	Exercise price Rs.	Call price Rs.
27th Nov	1250	145
27th Nov	1300	80
27th Nov	1350	20

What would be the gain or loss if you enter into a butterfly spread using call options with the exercise date of 27th November? Spot price on November 27<sup>th</sup> is Rs. 1280

OR

- Q.3 (a) State the assumptions of put call parity theory. How the put call theory is applied for binomial and BSM models? 7
- Q.3 (b) PepsiCo India Ltd requires 1,50,000 kg of frozen apples in April 2022. But there isn't any contract available for apples, instead there is a contract available for oranges for April 2022, the lot size of the contract is 15000 kg oranges per lot. Correlation co-efficient of apple and orange is 0.8. Standard deviation of spot price of apple is 0.3 and that of future price is 0.6. Find the optimum hedge ratio and optimum number of contracts required to hedge. 7
- Q.4 (a) If spot price is Rs.750, exercise price of a call option maturing after 90 days is Rs.800. Volatility is estimated to be 22%. The risk-free rate is 8% p.a. What will be the price of a call option that has a maturity of 90 days? 7
- Q.4 (b) Write a short note on options Greeks. 7
- OR
- Q.4 (a) On Sept 1st, call options are selling at Rs.70 on ICICI Bank shares with an exercise price of Rs.800 and exercise date of Oct 31st. Option contract size is 350 shares.  
(i) If the share price of ICICI Bank is Rs.860 on Oct 31st, what will be the gain or loss for the call option buyer?  
(ii) If the share price of ICICI bank is Rs.860 on October 31st, what will be the gain or loss for the call option writer? 7
- Q.4 (b) Explain the rationale behind using swaps. 7
- Q.5 (a) A merchant wants to buy 5 futures contracts on Dec 5th at Rs.5600 each carton. The initial margin is 5.5% of the contract value. The futures contract size is 50 carton. The merchant closes his position on 16th December. If variation margin is given as Rs.50,000, prepare margin account for buyer of the contracts. 7
- (b) Using the above information prepare margin account for the seller of the futures contracts. 7

Date	Futures Price Rs.
5th	5600
6th	5650
7th	5675
8th	5610
9th	5570
12th	5520
13th	5400
14th	5480
15th	5570
16th	5650

OR

- Q.5 A state bank share is selling at Rs.2500 on January 1st. The call and put options for SBI are trading at Rs.85 and Rs.160 respectively, for exercise price Rs.2700, for expiry on March 31st.
- (a) On February 14th, SBI share price is Rs.2540, what are the intrinsic value of put and call on 14th February? 7
- (b) Calculate net loss/gain for the buyer of put and call options if on the date of expiry the spot price is (i) Rs.2500 , (ii) Rs.2800 7

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