

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fourth Semester MBA Degree Examinations, October/November 2025
FINANCIAL DERIVATIVES

Duration: 3 hrs

Max. Marks: 100

- Note:** 1. Answer any FOUR full questions from Question No. 1 to 7.
2. Question No. 8 is compulsory
3. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PO)</u>																
1	a. Explain (i) ITM (ii) ATM (iii) OTM. b. Discuss the important economic functions performed by the derivative market. c. Explain each of the following types of traders in a derivatives market: (i) Hedgers (ii) Speculators (iii) Arbitrageurs	03 07 10	(2:3:1) (3:1:4) (4:1:2)																
2	a. What do you mean by Marking to Market? b. Explain the types of financial derivatives instruments. c. On 17 th June 2025, Mr. 'A' has taken short position in 5 future contract at Rs.170 per share on NTPC. Initial margin of the contract is 10 % and maintenance margin is 3/4 th of the initial margin. Prepare a margin account of the investor assuming that if a margin call is made at any time the investor would deposit the amount called for. Contract size of NTPC is 4,000. The closing prices of the share are given below:	03 07 10	(2:1:1) (3:1:2) (5:2:4)																
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Day</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> </tr> <tr> <td style="padding: 5px;">Settlement prices</td> <td style="padding: 5px;">172</td> <td style="padding: 5px;">169</td> <td style="padding: 5px;">174</td> <td style="padding: 5px;">176</td> <td style="padding: 5px;">172</td> <td style="padding: 5px;">175</td> </tr> </table>				Day	1	2	3	4	5	6	Settlement prices	172	169	174	176	172	175		
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3	a. What do you mean by butterfly spread? b. A Portfolio owns 3 securities:	03 07	(2:3:1) (3:3:1)																
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Company</td> <td style="padding: 5px;">Price</td> <td style="padding: 5px;">No. of shares</td> <td style="padding: 5px;">Beta</td> </tr> <tr> <td style="padding: 5px;">SWIGGY</td> <td style="padding: 5px;">400</td> <td style="padding: 5px;">15000</td> <td style="padding: 5px;">1.2</td> </tr> <tr> <td style="padding: 5px;">PETRONET</td> <td style="padding: 5px;">280</td> <td style="padding: 5px;">25000</td> <td style="padding: 5px;">1.8</td> </tr> <tr> <td style="padding: 5px;">ICICI</td> <td style="padding: 5px;">600</td> <td style="padding: 5px;">15000</td> <td style="padding: 5px;">0.8</td> </tr> </table>				Company	Price	No. of shares	Beta	SWIGGY	400	15000	1.2	PETRONET	280	25000	1.8	ICICI	600	15000	0.8
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SWIGGY	400	15000	1.2																
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(i) Calculate the portfolio beta. (ii) How many contracts are required for a full hedge? Additional information: Assume Future contract value at 1120, having multiple of 1000.																			
c.	Explain the option strategies: (i) Long Straddle Strategy (ii) Short Straddle Strategy (iii) Bull Spread option strategy (iv) Bear Spread Option Strategy.	10	(4:3:2)																
4	a. What is Hedging ratio? b. Discuss the factors affecting Option pricing model. c. Design a LONG STRADDLE STRATEGY For given information: Nifty is at 4500, A Call Option Strike Price Rs 4400 with Premium 43 and PUT option Strike price of Rs 4400 trading for premium of Rs. 23. On expiry, possible Nifty closing prices are: 4100, 4200, 4300, 4400, 4500, 4600, 4700, and 4800.	03 07 10	(2:2:1) (3:3:2) (6:3:2)																

5. a. What is triangular swap? **03 (2:4:1)**
 b. What is swap? Explain different types of financial swaps. **07 (3:4:2)**
 c. Company AXIS Bank wishes to borrow US dollar at a fixed rate of interest, company Federal Bank wishes to borrow Japanese Yen at a fixed rate of interest, the amount required by the two companies are roughly the same **10 (5:4:3)**

Company	Yen	Dollar
AXIS Bank	4.0%	8.6%
Federal Bank	5.5%	9.0%

Design a swap that will net a Bank which acting as intermediaries and charges 50 basis points per annum makes the swap equally attracted to the two companies & ensure that all foreign exchange risk is assumed by bank.

6. a. What is exotic options? **03 (2:3:5)**
 b. Explain (i) Asset Backed Securities (ii) Collateralized Debt Obligation. **07 (4:5:5)**
 c. A Portfolio consists of Rs. 400,000 invested in shares of company “A” and Rs. 600,000 invested in shares of company “B”, the daily volatilities measured by standard deviation for these two stocks are 1 % and 2 % respectively. The stock return is normally distributed. The correlation coefficient between the returns of these stocks is 0.40. Compute the 10 day 99 % “VaR” of the portfolio. By what amount has the diversification reduced VaR? (Use model building approach). **10 (4:5:5)**
7. a. What is the difference between long on call and long on put? **03 (2:3:1)**
 b. A future contract is available on NTPC with expiry in next 120 days is available for trade. Its spot price is Rs.169. what would be value of 120-day expiry contract? If the risk free interest rate is 7 %.
 (i) Calculate the fair value of the future contract if no dividend payment is made.
 (ii) How would the value be changes if a dividend of Rs 6.50 per share is expected to be paid in 30 days before the due date? **07 (3:3:2)**
 c. Price of Non-dividend paying share is Rs.155, A 3-month European call option has strike price of Rs.150, volatility is 30 % & risk free interest rate is 6 %pa. What is the Black Scholes price for a call? **10 (3:3:4)**

8. **Case Study**

On 1st of January 2025 an investor has a portfolio of 5 shares

Share	Market price	Number of shares	Beta
JSWCEMENT	59.50	5000	1.05
TCS	81.85	8000	0.35
NAUKRI	101.10	10000	0.80
OLAELEC	125.15	15000	0.95
TATASTEEL	140.50	1500	0.75

- a. Calculate the beta of the portfolio. **05 (5:3:5)**
 b. Calculate the theoretical future price for February contract if the current value of the Index is 1005 and market lot is 200 index, Assuming 12 % interest per annum. **05 (5:3:5)**
 c. Calculate the number of contracts required to sell in order to get full hedge until February, assume Future price are trading at fair value. **05 (5:3:5)**
 d. If the investor wants to reduce the beta of the portfolio to 0.70, how many contracts should be sold? **05 (5:3:5)**

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