

CBCS SCHEME

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20MBAFM402

Fourth Semester MBA Degree Examination, Dec.2023/Jan.2024 Financial Derivatives

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.
2. Question No. 8 is compulsory.
3. Use of Normal distribution table is permitted.**

- 1 a. What is Basis? (03 Marks)
b. Differentiate between Forward and Future contract. (07 Marks)
c. Consider a 6 – month forward contract 100 shares with a price of Rs 120 each.
i) The continuously compounded risk free rate is 10% p.a. The share yields dividend of Rs .50 in 4 months. Find the value of forward contract.
ii) Assume that dividend income worth Rs 300 is expected after 3 months and also after 6 months then what is the value of the contract? (10 Marks)

- 2 a. How does a pepper powder manufacturer hedge pepper futures expecting rise in prices? (03 Marks)
b. Explain the role of different type of players in the derivatives market. (07 Marks)
c. The following details pertaining to an investor who has taken short position in SIB futures contract. Prepare the 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 : 500 units ; Unit price : Rs 22 ;
No. of contracts : 8 ;
Initial margin : 12% ; Maintenance margin : $\frac{3}{4}$ th of initial margin. ;
Date of contract : June 3.
Closing prices :

Date	June 4	June 5	June 6	June 7	June 10	June 11	June 12	June 13
Price (Rs)	22.30	23.10	22.90	23.00	23.15	22.85	22.95	23.00

(10 Marks)

- 3 a. What is a Put – Call parity? (03 Marks)
b. Explain the various factors affecting option prices. (07 Marks)
c. From the following data, calculate the values of call and put options using Block and Scholes model :
Current price of the share : Rs 486
Exercise price : Rs 500
Time to expiration : 65 days
Standard deviation = 0.54
Continuously compounded rate of interest : 9% p.a.
Dividend expected : Nil. (10 Marks)

- 4 a. Define Commodity Swap. (03 Marks)
b. Explain the mechanics of interest rate swap. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- c. Company ABC and XYZ have offered the following rates per annum on a Rs 200 million loan :

	Fixed rate (%)	Floating rate (%)
ABC	12.0%	MIBOR + 0.1%
XYZ	13.4%	MIBOR + 0.6%

ABC requires floating rate loan and XYZ requires fixed rate loan. Design a swap that will net a bank acting as intermediary 0.1% per annum and equally attractive to both the parties. Show the diagram.

- (10 Marks)
- 5 a. How does a petrol bunk owner hedge his stock using commodity derivatives? (03 Marks)
 b. Explain the trading and settlement mechanism in commodity exchanges in India. (07 Marks)
 c. A call option with an exercise price of Rs 100 is available on a share which is currently sold at Rs 100. The price of the share is likely to be up by 15% or down by 10% at the end of 3 months. The risk free rate is 20%. Determine the hedge ratio and the value of the call option using the binomial model. (10 Marks)

- 6 a. What is Value at Risk? (03 Marks)
 b. Elucidate the use of credit default and total return swaps. (07 Marks)
 c. Suppose that the spot (zero) rates with continuous compounding are as follows :

Maturity (years)	1	2	3	4	5
Rate (% pa)	12.00	13.00	13.70	14.20	14.50

Calculate forward interest rates for the second, third, fourth and fifth year. (10 Marks)

- 7 a. What is Theta in option Greek? (03 Marks)
 b. What is Butterfly spread? When do the investors prefer this strategy? (07 Marks)
 c. Consider a position consisting of Rs 3,00,000 investment in gold and Rs 5,00,000 investment in silver. Suppose that the daily volatilities of these investments are 1.8% in gold and 1.2% in silver and the coefficient of correlation between their returns is 0.6. What is the 10 - day 97.5% value at risk for the portfolio? By how much does diversification reduce the VAR? (10 Marks)

8 **CASE STUDY (Compulsory) :**

On January 1, 2022 an investor has a portfolio of 5 shares as given here :

Security	Price	No. of shares	Beta
A	59.50	5,000	1.05
B	81.85	8,000	0.35
C	101.10	10,000	0.80
D	125.15	15,000	0.85
E	140.50	1,500	0.75

- The cost of capital to the investor is 12.5% per annum. You are required to
- a. Calculate the beta of his portfolio. (05 Marks)
 b. Calculate the theoretical value of the Nifty futures for February. (05 Marks)
 c. If the current value of Nifty is 17,000 and Nifty futures have a minimum trade lot requirement of 75 units, obtain the number of contracts of Nifty he needs to sell in order to get a full hedge until February for his portfolio. Assume that the futures are trading at their fair value. (05 Marks)
 d. Calculate the number of future contracts the investor should trade if he desires to reduce the Beta of his portfolio to 0.7. (05 Marks)
