

# CBCS SCHEME

18MBAFM405



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## Fourth Semester MBA Degree Examination, July/August 2021 Financial Derivatives

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions.  
2. Use of Interest Factor tables and 'Z' tables are permitted.**

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.

- 1 a. Define derivate market. (03 Marks)  
 b. Explain the features of derivate market. (07 Marks)  
 c. Consider a six months forward contract on 100 shares with a price of Rs.38 each.  
 (i) The continuously compounded risk-free rate is 10% p.a. The share yields dividend of Rs.1.50 in 4 months. Find the value of forward contract.  
 (ii) Assume that dividend income worth Rs.150 is expected after 3 months and also after 6 months then what is the value of contract? (10 Marks)

- 2 a. What do you mean by future contract? (03 Marks)  
 b. Elucidate the different types of players in the derivative market and their role. (07 Marks)  
 c. The following details pertaining to an investor who has taken short position in a futures contract for 100 kg of wheat. Contract price Rs.16.50 per kg. Contract size 1000 units. Initial margin 10% maintenance margin 80% of initial margin. The price of future of the first six days was as follows:

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
16.65	16.75	16.90	16.80	17.35	17.00

Prepare the margin account of the investor, assuming that any margin call is met immediately. (10 Marks)

- 3 a. What are currency swaps? (03 Marks)  
 b. "Financial swaps are not funding instrument, they are asset-liability management tools". Explain. (07 Marks)  
 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)

- 4 a. What is a put call parity? (03 Marks)  
 b. Explain the factors affecting option prices. (07 Marks)  
 c. Calculate the value of a call option using B/S model given the following information:

Current market price of the share = Rs.75  
 Volatility (standard deviation) = Rs.0.45  
 Exercise price = Rs.80  
 Risk free interest rate = 12%  
 Time to expiry 6 months.

If the investor want to buy a put option with the same exercise price and expiry date as call option, what will be the value of put option? (10 Marks)

- 5 a. What is Forward rate agreement? (03 Marks)  
 b. What is a butterfly spread? When do the investors prefer to use this strategy? (07 Marks)  
 c. A call option with an exercise price 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 do you mean by commodity derivatives? (03 Marks)  
 b. Explain trading and settlement mechanism in commodity exchanges. (07 Marks)  
 c. Suppose that the spot (zero) rates with continuous compounding are as follows:

Maturity (years)	1	2	3	4	5
Rate (% per annum)	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 collateralized debt obligation? (03 Marks)  
 b. What is credit default and total return swaps? What are their uses? (07 Marks)  
 c. Suppose that the risk-free zero curves is flat at 7% p.a. with continuous compounding and that defaults can occurs halfway through each year in a new 5-year credit default swap. Suppose that the recovery rate is 30% and the default probabilities each year conditional on no earlier default is 3%. Estimate the credit default swap payoff. Assume payment is made annually and probability of default is 0.0300, 0.0291, 0.0282, 0.274 and 0.0266. (10 Marks)

- 8 Mr. Pramod Gupta, owner of medium size mill in Madhya Pradesh was looking at the price of wheat futures in July. One futures contract on premium quality wheat with six months maturity was traded for Rs.1675 at the time. The size of a contract was 1000 kilograms. Gupta procures premium quality wheat from different parts of Madhya Pradesh during the harvest season and stores the same in a warehouse near his mill. His average storage cost works out to be Rs.25 per quintal for a period of six months. He pay this in advance and the rent for next six months is due now. His operations involve cleaning and processing of wheat and manufacturing atta. He supplies atta to some of leading bread and biscuit makers in Madhya Pradesh. His business has been doing extremely well, he was able to supply quality after at all seasons to his customers. The premium quality wheat was sold in the spot market for Rs.16 per kilogram at that time. One of Gupta's friend advised him that he should start making profit from the price movement of wheat in the futures market. Though Gupta was reluctant to this proposal, he was keen on knowing the process of making such profits. The risk free rate of interest in July was 8% per annum continuously compounded.

- a. What is the arbitrage opportunity that Gupta has? (05 Marks)  
 b. Design an arbitrage for Gupta and compute the profit that he could make. (05 Marks)  
 c. If Gupta is reluctant to profit from his arbitrage what are the reasons for the same? (05 Marks)  
 d. What benefits are the holders of wheat like Gupta expecting from storing the same and how much is that benefit? What is that benefit called? (05 Marks)

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