CBCS SCHEME

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20MBAFM402

Fourth Semester MBA Degree Examination, June/July 2023
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.***

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. What do you mean by Marking to Market? **(03 Marks)**

b. Explain the types of Financial Derivatives instruments. **(07 Marks)**

c. Using the following data, prepare the margin account of an investor. Assume that if a margin call is made at any time, the investor would deposit the amount called for
Position = Short : Contract size = 500 units. Unit price = Rs 22 ; Number of contracts = 8 ; Maintenance margin = ¾th of initial margin Date of contract = June 3 ;
Initial margin = 12%. Closing prices are :

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

(10 Marks)

2 a. Differentiate between Exchange traded and over the counter derivatives. **(03 Marks)**

b. A share is currently traded at Rs 78. A 3 – month futures contract on this share is traded at Rs 80.50. The risk free rate of return continuously compounded is 8% p.a. No dividend is expected to the share in the next 3 months. Is there any arbitrage opportunity here? If so, then discuss the outcome. **(07 Marks)**

c. Explain the key differences between Forward and Future contracts. **(10 Marks)**

3 a. What is Covered call and Naked Call? **(03 Marks)**

b. Consider the following data about April 2021 NIFTY options [all values are the opening values of the day].

Exercise Price	1060	1080	1100	1120	1140	1160	1180	1200	1220
Call Premium	-	-	50.00	31.05	17.45	8.00	4.95	2.75	1.00
Put Premium	1.10	1.30	2.60	6.00	12.25	23.40	-	-	-

The index opened at 1,146.05. Classify the options on the basis of their "moneyness" and segregate the intrinsic and time values. **(07 Marks)**

c. Briefly explain the Option trading strategies. **(10 Marks)**

4 a. What is Put – Call Parity? **(03 Marks)**

b. The following information is available on call options involving 1100 shares with two months expirations dates on a stock :

Strike price	Rs. 170	Rs. 180	Rs. 190
Premium	Rs. 21.10	Rs. 14	Rs. 8

Explain how the option can be used to create Butterfly spread. Find the pay – off for the investor at various range of stock price Rs 168 , Rs 176 , Rs 185 , Rs 189 and Rs 198. **(07 Marks)**

c. The current price of a share is Rs 50 and it is believed that at end of one month the price will be either Rs 55 or Rs 45. What will a European call option with an exercise price of Rs 53 on this share be valued at, if the risk free rate of interest is 15% per annum. Also calculate hedge ratio, applying binomial formulation. **(10 Marks)**

5 a. What do you mean by Butterfly Spread? **(03 Marks)**

b. Create a long straddle from the following information :
   * Call strike price = Rs 380 ; Call premium = Rs 15.
   * Put strike price = Rs 380 ; Put premium = Rs 18.
   Closing price as follows = Rs 300 , Rs 350 , Rs 375 , Rs 400 , Rs 425. **(07 Marks)**

c. The share of a Company are currently traded at Rs 120/-. Compute the price of a call option on the share with an exercise price of Rs 115 using Black and Schole model. The time to maturity is three months. The risk free rate of interest continuous compounded is 10% per annum. The standard deviation is 0.6. Also compute the price of a put option on this share with the same exercise price and maturity using put – call parity. The option mentioned is of European nature. **(10 Marks)**

6 a. What do you mean by VaR? **(03 Marks)**

b. Suppose the zero interest rates with continuous compounding are as follows :

Maturity (Yrs)	1	2	3	4	5
Rate (% per annum)	2.0	3.0	3.7	4.2	4.5

Calculate forward interest rates for the second, third, fourth and fifth years. **(07 Marks)**

c. Company ABC and XYZ have offered the following rate on a $ 200 millions for 5 yrs loan.

Firm	Fixed Rate	Floating Rate
ABC	12%	L + 0.1
XYZ	13.4%	L + 0.6

Company ABC requires a floating rate loan. Company XYZ required a fixed rate loan. Design a swap that will net a bank acting as intermediary of 0.1%. **(10 Marks)**

7 a. What do you mean by Forward Rate Agreement? **(03 Marks)**

b. A portfolio consists of Rs 4,00,000 investments in shares of XYZ and Rs 6,00,000 in shares of ABC limited. The annual volatilities of these two assets are 30.4% and 22.4% respectively. The co-efficient of correlation between the return is 0.6. Compute the 15 days 97.5% VaR for the portfolio and interpret the result. Explain by what amount the diversification has reduced the VaR. Assume 256 trading days in a year. **(07 Marks)**

c. Explain the factors contributing to the growth of Derivative markets in India. **(10 Marks)**

8 **CASE STUDY (Compulsory)** :

On 1st of Jan. 2022, an investor has portfolio consisting of 8 securities as shown below :

Security	A	B	C	D	E	F	G	H
Price	29.4	318.7	660.2	5.2	281.9	275.4	514.6	170.5
No. of share	400	800	150	300	400	750	300	900
Beta	0.59	1.32	0.87	0.35	1.16	1.24	1.05	0.76

The cost of capital for the investor is given to be 20% p.a. The investors fears a fall in prices of share in the near future. You are required to calculate :

a. The Beta of the port folio.

b. Calculate the theoretical values of futures contract according to the investors for contract expiring on February and March.

c. Calculate the number of units of SNP CNX Nifty he would have to sell if he desires to hedge until March.

d. Calculate the number of future contracts the investors should trade if he desires to reduce Beta to 0.7.

Additional Information :

a) The current SNP CNX Nifty value is 986.

b) SNP CNX Nifty can be traded in units of 200 only.

c) Feb. Futures are currently quoted at 1010 and March futures are being quoted at 1019. **(20 Marks)**