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18MBAFM405

Fourth Semester MBA Degree Examination, Aug./Sept.2020 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.**

- 1**
- a. What is Financial Derivative? (03 Marks)
 - b. Explain the differences between forward contracts and future contracts. (07 Marks)
 - c. Assume that a Stock Index consists of 5 stocks. Currently the index stands at 970/-. Obtain the price of a future contract with expiration in 115 days on this index having references to the following additional information.
 - i) Dividend of Rs 6/- per share is expected on share 'B' , 20 days from now.
 - ii) Dividend of Rs 3/- per share is expected on share 'E' , 28 days from now.
 - iii) Continuous compounding risk free rate is 8%.
 - iv) Lot size is 300 units. (10 Marks)

Company	Share Price	Market Capitalisation
A	22	110
B	85	170
C	124	372
D	54	216
E	25	200

- 2**
- a. What do you mean by Marking to Market? (03 Marks)
 - b. Discuss each of the following type of traders in a derivative market :
Hedgers , Speculators and Arbitrageurs. (07 Marks)
 - c. Consider the following data about April 2018 NIFTY options, (all values taken are the opening values for the day).

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

* The Index opened at 1146.05. Calculate the Intrinsic value and Time value of an option. (10 Marks)

- 3**
- a. What is 'Put – Call Parity'? (03 Marks)
 - b. Explain in details the Spreads and Combination – Trading strategies in options. (07 Marks)
 - c. The current price of a share is Rs 50 and it is believed that at the 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 the hedge ratio, applying binomial formulation. (10 Marks)



- 4 a. What do you mean by ‘Option Greeks’? (03 Marks)
 b. The following information is available on call option involving 1100 shares with two months expiration dates on a stock. Explain how the option can be used to create Butterfly spread using the given data :

Strike Price	Rs 170	Rs 180	Rs 190
Premium	Rs 21.10	Rs 14.00	Rs 8.00

Find the pay – off using the various ranges of stock prices as Rs 168 , 176, 185, 189 and Rs 198. (07 Marks)

- c. The shares of a Company are traded at Rs 258/-. Compute the price of a call option on this share with an exercise price of Rs 248/- using Black and Scholes model. Time to maturity is six months. The risk free rate of Interest continuously compounded is 8% per annum. The standard deviation of the continuously compound annual rate of returns of the stock is 0.3. Also compute the price of a put option on this share with the same exercise price and maturity using Put - Call parity. (10 Marks)
- 5 a. What do you mean by Financial Swap? (03 Marks)
 b. Explain ‘Plain Vanilla Swap’ and discuss the underlying motives for swap transactions. (07 Marks)
 c. Company ABC and XYZ have offered the following rates per annum on a Rs 100 million loan.

	Fixed rate %	Floating rate %
ABC	12 %	MIBOR + 0.1 %
XYZ	13.4 %	MIBOR + 0.6 %

Company ABC is interested in floating rate loan and company XYZ is interested in 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)

- 6 a. What do you mean by VaR? (03 Marks)
 b. Discuss the Historical Simulation method of estimating VaR. (07 Marks)
 c. A portfolio consists of 4,00,000 investment in shares of XYZ and Rs 6,00,000 shares of ABC limited. The annual volatilities of these two assets are 30.4% and 22.4% respectively. The co-efficient of correlation between their return is 0.6. Compute the 15 days 97.5% VaR for the portfolio and interpret the results. Explain by what amount the diversification has reduced the VaR. Assume 256 trading days in a year. (10 Marks)

- 7 a. Explain Commodity Trading. (03 Marks)
 b. Create a long Straddle from the given information :
 i) Call strike price : Rs 380 ; Call premium – Rs 15.
 ii) Put strike price : Rs 380 ; Put premium – Rs 18.
 Closing prices are as follows : 300 , 350 , 375 , 400 , 425 , 450 , 475 , 525. (07 Marks)

- c. The following table gives the prices of bonds :

Bond Principal	Time to Maturity	Annual Coupon	Bond Price
1000	0.5	0.0	98
100	1.0	0.0	95
100	1.5	6.2	101
100	2.0	8.0	104

(Held the stated coupon is assumed to be paid every 6 months)

- i) Calculate the zero rates for maturities of 6 months, 18months and 24 months.
 ii) What are the forward rates? (10 Marks)



- 8 On January 1, 2019 an investor has a portfolio of 5 shares as given below :

Security	Price	No. of shares	Beta
A	59.50	5000	1.05
B	81.85	8000	0.35
C	101.10	10000	0.80
D	125.15	15000	0.85
E	140.50	1500	0.75

The cost of capital to the investor is 12.5% per annum.

You are required to :

- Calculate the beta of his portfolio. **(05 Marks)**
- Calculate the theoretical value of NIFTY futures for February. **(05 Marks)**
- If its current value is 1005 and NIFTY futures have a minimum trade lot requirements of 200 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)**
- Calculate the number of futures contracts the investor should trade if he desires to reduce the beta of his portfolio to 0.7. **(05 Marks)**
