



## Fourth Semester MBA Degree Examination, Dec.2024/Jan.2025

### Financial Derivatives

Max. Marks:100

Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.  
2. Question No. 8 is compulsory.

- 1 a. What is Forward Contract? (03 Marks)  
b. Identify the factors contributing to the Growth of Derivatives. (07 Marks)  
c. Explain the functions of Derivatives Market. (10 Marks)
- 2 a. Identify the traders involved in derivatives market. (03 Marks)  
b. Explain the benefits of swaps. (07 Marks)  
c. Mr. Vishwas has shorted five copper futures at an exercise price of Rs.325 per kg. The initial margin of the contract is 15% and the maintenance margin is 80% of initial margin. The future prices for the first five days of the contract are given below:  

Day	1	2	3	4	5
Settlement Price	340.50	332.10	363.60	354.30	371.25

Prepare a margin account of the investor assuming that all margin calls are honoured immediately and lot size of the contract is 1000 kg. (10 Marks)
- 3 a. What is SPAN based margin? (03 Marks)  
b. A future contract is available on NTPC which is currently trading at Rs.169 and due in 50 days from now.  
(i) What would be value of the contract if the continuously compounded, annual risk-free rate of interest is 7% and the contract involves 4000 shares?  
(ii) How would the value be changed if a dividend of Rs.6.50 per share is expected to be paid in 20 days before the due date? (07 Marks)  
c. Mr. Raj has constructed a portfolio with Rs.15,00,000; out of which Rs.8,00,000 is invested in IT stocks and Rs.7,00,000 in pharma stocks. The daily volatility measured by the standard deviation of IT stocks is 1.75% and that of pharma stock is 1.50%. The returns of both the stock are normally distributed. The correlation coefficient between the returns of these stocks is 0.60.  
You are required to compute:  
(i) 10 days 95% VaR of the portfolio using model building approach  
(ii) By what amount has the diversification reduced the VaR? (10 Marks)
- 4 a. What do you mean by intrinsic value? (03 Marks)  
b. Explain the different types of financial swaps. (07 Marks)  
c. Mr. Sagar forecasts that the market will be bullish in the near future, and hence creates a bull spread by way of buying August 2017 call option with an exercise price of Rs.325 for Rs.3 and selling a call option with an exercise price of Rs.330 for Rs.2 per share of ITC. Find out how much profit or loss he makes if, on the maturity, the spot rate is expected to be Rs.320, Rs.327 or Rs.335 per stock. Also find out breakeven price. (Assume the contract size is 2400). (10 Marks)

- 5 a. What is zero coupon swap? (03 Marks)  
b. Mr. Gupta writes a call option contract, maturing in August 2017, with Mr. Raja on Britannia shares at an exercise price of Rs.3,710 for the premium of Rs.70 per share with contract size of 200. How does each party is benefitted for the contract if the market moves either downward or upward assuming Rs.3600, Rs.3710 and Rs.3800 per share as the settlement prices on the maturity? (07 Marks)  
c. Sun Ltd. and Moon Ltd. require Rs.5 million for five years term and have been offered the following rates:

Companies	Fixed	Floating
Sun Ltd.	8.5%	6 month LIBOR + 0.50%
Moon Ltd.	9.6%	6 month LIBOR + 0.80%

Sun Ltd. wants to borrow at a floating rate linked to six-month LIBOR while Moon Ltd. wants to borrow at a fixed rate. Help the companies to design an interest rate swap which is equally attractive to both the companies if  
(i) Swap is arranged without financial intermediary  
(ii) Swap is arranged with swap dealer who will charge 10 basis points. (10 Marks)

- 6 a. What do you mean by Bull Spread? (03 Marks)  
b. The spot [zero] interest rates with continuous compounding are as follows:  

Maturity period (yr)	1	2	3	4	5
Zero rates p.a. (%)	8.50	9.10	9.25	10.40	11.30

Calculate forward rates for the second, third, fourth and fifth years. (07 Marks)  
c. A call option with an exercise price of Rs.67.50 is available on USD which is currently sold at Rs.65. The price of the USD is likely to be up by 6% or down by 5% at the end of 3 months. The annual risk free rate is 7.5% in India and 6% in the USA. Calculate value of the call option using binomial model and hedge ratio. (10 Marks)
- 7 a. What is option Greeks? (03 Marks)  
b. Give a brief account of SEBI guidelines for commodity derivative market. (07 Marks)  
c. Explain the different types of futures contracts. (10 Marks)

#### 8 Case Study:

**CMRIT LIBRARY**  
BANGALORE - 560 037

Mr. Ravindra, on 1<sup>st</sup> May 2017, has constructed a portfolio consisting of five shares the detail of which is given below:

Scripts	Market Price (Rs.)	No. of shares	Beta (Rs.)
ACC	1700	5500	0.85
Cipla	600	9500	1.00
BHEL	180	12000	0.75
GAIL	420	8000	0.80
IDBI	110	15000	1.10

The annual cost of capital to the investor is 9% (continuously compounded) and current value of the Nifty is 9900 with dividend yield of 3%. You are required to:  
(i) Calculate beta of the portfolio  
(ii) Calculate the theoretical value of the Nifty July and August futures  
(iii) If Nifty futures contract has a lot size of 100 units, find the number of contracts of Nifty futures the investor needs to short in order to get a full hedge of the portfolio until August if current value of the index is 9950.  
(iv) Calculate the number of futures contracts the investors should trade if he desires to reduce the beta of his portfolio to 0.80 on 1<sup>st</sup> May 2017 to hedge till August. (20 Marks)