



# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, Master of Business Administration (MBA)

Semester End Examination; July / Aug. - 2022

Financial Derivatives

Time: 3 hrs

Max. Marks: 100

### Course Outcomes

The Students will be able to:

CO1 – The Students will understand the mechanism of forwards/futures, options, financial swaps, commodity derivative.

CO2 – The Students will assess the application of derivative instruments using numerical problems.

CO3 – The Students will suggest and make better decisions for their company in risk management.

CO4 – The Students will become more curious to research on the new developments that are taking place in business environment.

**Note: I) Answer all FOUR full questions from PART - A and PART - B (Case Study) is compulsory.**

**II) Scientific calculator is allowed.**

Q. No.	Questions	Marks	BLs	COs																						
<b>PART - A</b>																										
1 a.	What are the financial derivatives? What are objectives and functions of financial derivatives?	10	L1	CO1																						
b.	What would be the theoretical price of six months futures contract on ACC which is currently trading at Rs. 118 and is expected to pay dividend per share of Rs. 5 in one month and Rs. 7 in four months' time? The continuously compounded annual risk-free rate of interest is assumed to be 8%;																									
i)	What would be value of long and short futures contract if 6 months futures contract is trading @ Rs.105per share and the futures price is assumed to be the delivery prices?	10	L1	CO1																						
ii)	If the forecast indicates that the stock price will move up. Do you advise your client to go for a long forward or a short forwards contract? Why?																									
<b>OR</b>																										
2 a.	What is Contango and Backwardation market? Mention the assumptions of cost of carry model?	10	L5	CO1																						
b.	Mr. Gupta look long position in five futures contracts on rice at an exercise price of \$50 per kg. The initial margin on this contract is 10% and maintenance margin is 85% of the initial margin. The size of each future contract is 1000 kg. The futures prices for the first 10 days of the contract are given below:																									
	<table border="1"> <thead> <tr> <th>Date</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>Price Rs.</td> <td>52.50</td> <td>51.25</td> <td>51</td> <td>51.80</td> <td>51.40</td> <td>51.10</td> <td>49.75</td> <td>50.30</td> <td>50.50</td> <td>50.25</td> </tr> </tbody> </table>	Date	1	2	3	4	5	6	7	8	9	10	Price Rs.	52.50	51.25	51	51.80	51.40	51.10	49.75	50.30	50.50	50.25	10	L4	CO1
Date	1	2	3	4	5	6	7	8	9	10																
Price Rs.	52.50	51.25	51	51.80	51.40	51.10	49.75	50.30	50.50	50.25																

Prepare a margin account assuming that all margin calls are honored immediately and money in excess of the initial margin is withdrawn immediately.

- 3 a. A 3 months futures contract on ITC is available at Rs. 327 which is currently trading at Rs. 320 in the spot market. Assume that the CCRf is 7% and no dividend is expected from the share in the next three months. Do you agree that the futures market and spot market price are consistent so as not to offer an arbitrage profit? If no explain the process of arbitrage and find the amount of profit to be made. 10 L2 CO2
- b. What is forward and futures contract? Explain the salient features of forward and futures contract? 10 L4 CO2

**OR**

- 4 a. Mr. Ramesh on 1<sup>st</sup> April 2022 has constructed a portfolio consisting of five shares, the detail of which is given below:

Scrip's	Mkt / Price(Rs.)	No. of Shares	Beta (Rs.)
ACC	1,750	5000	0.90
CIPLA	550	8000	0.85
BHEL	140	10,000	0.80
GAIL	390	15,000	0.75
IDBI	60	10,000	1.05

The annual cost of capital to the investor is 10%. Continuously compounded and current value of the Nifty is 9950. You are required to: 10 L4 CO2

- i) Calculate beta of the portfolio.
  - ii) Calculate the fair value of the Nifty June futures
  - iii) If Nifty futures contract has a lot size of 75 units, find the number of contracts of Nifty futures the investor needs to short in order to get a full hedge until June for his portfolio. Assume that the Nifty futures are trading @ their fair value.
  - iv) Calculate the number of futures contract the investor should trade if he desires to reduce the beta of his portfolio to 0.75
- b. "Options are versatile and flexible hedging tool" elaborate. 10 L1 CO3
- 5 a. Consider the following data about June 2022 NIFTY option (Opening values of the day are taken):

Ex. Price (Rs.)	9860	9880	9900	9920	9940	9960	9980	10000	10020
Call(Rs.) Premium	NA	NA	45.25	23.40	15.50	12.20	9.60	8.35	7.80
Put (Rs.) Premium	8.70	9.70	10.60	13.25	15.40	24.50	NA	NA	NA

The June NIFTY opens @9940 on 3<sup>rd</sup> June 2022. Classify each of the above option and find out intrinsic and time value of the option. (NA-options are not available). 10 L4 CO3

b. Consider a call of Wipro Ltd., with a strike price of Rs. 1,720 each due to expire in 25 days time is selling @ Rs. 50 per share. The stock is currently trading at Rs. 1,790 in the spot market. How can an arbitrageur benefit from the current scenario, assuming that the contract is settled through physical delivery? Lot size of each contract is 400 shares.

10 L4 CO3

**OR**

6 a. An investor holds a long position in 1000 shares of a certain company. He bought these shares @ 210 each. Fearing a fall in the market, he has bought a put option contract involving 1000 shares with exercise price of Rs. 212 @ a premium of Rs. 7.80 per share. Explain how this position will perform in different price scenarios on expiration.

10 L4 CO3

Days	1	2	3	4	5	6	7	8
Share Price	190	195	200	205	210	215	220	225

b. The following call options are traded in the market at present with the same maturity. Explain how an investor can create a butterfly spread using the below options. Explain his profit/loss if the spot price at maturity is: Rs. 55; Rs. 70; Rs. 80; Rs. 95

10 L4 CO3

Exercise Price	60	75	90
Call Price	7	5	4

**OR**

7 a. Create a short straddle from the given information: Call strike price Rs. 310 per share: put strike price Rs. 310: Premium for call Rs. 21 per share; Premium for Put Rs. 42 per share. Also show the net pay-off and closing price an expiry date as follows:

10 L4 CO3

Day	1	2	3	4	5	6	7	8	9	10	11
Price	220	240	260	280	300	310	320	340	360	380	400

b. What is binomial model? Mention the factors influencing option price and assumptions of binomial model.

10 L6 CO2

**OR**

8 a. SRS Ltd., a low credit rated firm has access to floating interest rate funds at a margin of 1.75% over LIBOR, but desires a fixed-rate long-term debt which can be raised at 12% in Eurodollar bond market. However, VRL Ltd., prefers floating and has access to fixed rate loan in the Eurodollar bond market at 9.75% and floating rate funds at LIBOR + 1.00. How can both the firms enter into swap equally attractive? How much would SRS Ltd., and VRL Ltd., pay to each other for the debt raised?

10 L4 CO4

b. Write a note of Forward market commission.

10 L6 CO5

**PART - B Case Study is compulsory**

9. The current spot rate of IOC is Rs. 380 and which is expected to rise by 4% or fall by 2% after a month. The annual continuously compounded risk-free interest rate is 9%.

20 L4 CO3

i) What is the value of one month European call option on the stock with strike price of Rs.365?

ii) How many call options is/are to be traded to hedge entire risk in the portfolio?

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