



## 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; June - 2017

**Risk Management**

Time: 3 hrs

Max. Marks: 100

*Note: Answer all FOUR full questions from PART-A and PART-B (Case study) is Compulsory.*

### PART - A

- 1 a. Define derivative. Discuss the functions of derivative market. 10
- b. A trader has gone long on 5 brent crude futures for December settlement \$ 26.32 per barrel. The minimum size for brent futures contract is 100000 barrel. The initial margin is \$ 50000 per contract and the maintenance margin is \$ 30000 per contract. The future closes at the following prices on the next ten trading days :

Day	1	2	3	4	5	6	7	8	9	10
Future Price(\$)	26.19	26.3	26.45	26.48	26.34	26.21	26.98	26.87	26.9	25.95

The trader will take out the profit out of margin account whether he gets the opportunity to do so.

- i) You are required to prepare the margin account showing the margin calls.
- ii) Find the profit/loss for the trader after ten trading days.

### OR

- 2 a. Consider a one year futures contract on an investment asset that provides no income. It costs ` 2 per unit to store the asset with payment being made at the end of the year. Assume that the spot price is ` 450 per unit and one continuously compounded risk free rate is 7% per annum for all maturates. What is future price? 10
- b. Explain hedging, speculation and arbitrage with example. 10
- 3 a. Explain in detail the difference between forwards and futures. 10
- b. Assume that a market capitalization weighted index contains only 3 stocks A, B and C as shown below: The current value of Index is 1056.

Company	Share Price (`)	Market Capitalization (cr)
A	120	12
B	50	30
C	80	24

Calculate the price of a futures contract with expiration in 60 days on this index, if it known that 25 days from today, company A would pay a dividend of ` 8/- per share. C would pay a dividend of ` 4 per share. The risk free rate of interest to be 13.98% per annum continuously compounded. Assume the lot size to be 200 units.

**OR**

- 4 a. Discuss the four types of option with a pay off diagram. 10
- b. From the following information, compute the value of European call option using black and scholes formula. Current price of the share = ` 220, Exercise price of the option = ` 200, Time period to expiration = 3 month, Standard Deviation of continuously compounded rate = 0.6, continuously compounded risk free interest rate = 0.1. 10
- 5 a. Explain the term intrinsic value and time value and from the following information calculate the intrinsic value and time value of the options.

Option	Stock Price (`)	Exercise Price (`)	Option Price (`)
Put	48	40	5
Put	38	45	7.8
Call	111	95	15
Call	45	50	7.8

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- b. Explain in detail the process of Risk Management. 10

**OR**

- 6 a. In May 2013, a 6 month call on XYZ Ltd stock with an exercise price of ` 25/- sold for ` 2/- . The stock price is ` 20/-. The risk free rate of interest was 5% p.a. 10
  - i) How much would you be willing to pay for a put on XYZ Ltd stock with the same maturity and exercise price?
  - ii) What happens, if the market price is different from what you are willing to pay?
- b. Shares of X Ltd are selling at ` 104 per share. Mr. Ganesh wants to chip in with buying a 3 month call option at a premium of ` 5 per option. The exercise price is ` 105. Six possible prices per share on the expiration date ranging from ` 95 to ` 120, with intervals of ` 5 are possible. 10
  - i) What is Ganesh's pay off as call option holder on expiration?
  - ii) Draw the payoff graph.
  - iii) What is the call writer's pay off on expiration?
  - iv) Draw the pay off graph.
- 7 a. Explain the factors affecting the pricing of options. 10
- b. The following tables give the zero rate of the bond with principal of ` 100 provides coupons at the rate of ` 10% per annum paid on semiannual basis.

Maturity (years)	Zero rates (%) Compounded continuously
0.5	4.0
1	4.2
1.5	4.4
2	4.6

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- i) Calculate present value of the bond.
- ii) What are the forward rates of 6, 12, 18 and 24 months?

**OR**

8 a. Suppose that a futures contract with four months to maturity is used to hedge the value of a portfolio over the next month in the following situation: Value of S & P500 index 1250, S & P futures 1275, value of portfolio \$5050000, Risk free interest rate 4% per annum. Dividend yield on index 1% per annum. Beta of portfolio 1.5, Lot size is 250 units.

- i) Determine the number of futures contract that should be shorted to hedge the portfolio. 10
- ii) Suppose the index turns out to be 1100 in 3 months and the future price is 1150, determine the gain from short future position.
- iii) Suppose the index turns out to be 1100, calculate the expected return on portfolio according to CAPM. Also calculate expected value of the portfolio.

b. The following data is given about a call options on a share which is currently traded ` 54 with the multiplier of 800.

Exercise price (`)	50	55	60
Call price (`)	8	4.5	2

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State the strategy that can be developed and determine the profit or loss from this strategy when the share price is ` 42, ` 55 and ` 60 and ` 65 respectively.

**PART - B (Compulsory)**

**9. Case Study:**

The following data gives the prices of bonds :

Bond Principal (\$)	Time of Maturity (Yrs)	Annual Coupon(\$)*	Bond Price (\$)
100	0.5	0.0	98
100	1.0	0.0	95
100	1.5	6.2	101
100	2.0	8.0	104

\* Half the stated coupons is paid every six months

- a) Calculate zero rates for maturities of 6 months, 12 months, 18 months and 24 months.
- b) What are the forward rates of the periods; 6 months to 12 months, 12 months to 18 months, 18 months to 24 months?
- c) What are the 6-month, 12-month, 18-month and 24-month par yields for bonds that provide semi annual coupon payments?
- d) Estimate the price and yield of a two-year bond providing a semiannual coupon of 7% per annum.

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