



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS ENTREPRENEURSHIP AND MANAGEMENT
SCIENCES

FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF COMMERCE
(FINANCE OPTION)

BAC 309: FINANCIAL DERIVATIVES

Date: 10/7/2016

Time: 2 HOURS

INSTRUCTIONS

Answer Question One and any Other Two Questions

QUESTION ONE.

- (a) Define a derivative instrument. (1 mark)
- (b) Distinguish between Futures and Forwards. (5 marks)
- (c) The current price of the stock on which a call option is written is Kshs.320 and the exercise price of the call is Kshs.300. The maturity term of the option is 0.25 years and the annualized variance in the returns of the stock is 16%. The risk free rate of interest is 4%p.a.

Required:

- i) Represent the above information graphically. (6 marks)
- ii) Calculate the value of the call option using the Black - Scholes option pricing model. (6 marks)
- d) Explain the following terms as used in interest rate options
 - i) Caps
 - ii) Floors
 - iii) Collars (6 marks)

- e) Suppose that in September 2010, you take a long position in a contract on May 2011 crude oil futures. You close out your position in March 2011. The futures price per barrel is \$18.30 when you enter into your contract, \$20.50 when you close out your position, and \$19.19 at the end December 2010. One contract is for the delivery of 1,000 barrels.
- i) What is your total profit? (2 marks)
 - ii) When is it realized? (4 marks)

QUESTION TWO

- a) Explain the following terms.
 - i) Long position (3 marks)
 - ii) Short Position (3 marks)
 - iii) Striking Price (2 marks)
- b) Explain four functions of financial derivatives. (6 marks)
- c) A company bought a two year futures contract on gold that provides no income. It costs Shs.20 per unit to store the gold with the payment being made at the end of the two years. If the spot price of the gold is Shs.4,500 per unit and the risk free interest rate is 7% per annum for all maturities, calculate the theoretical futures price F_0 (6 marks)

QUESTION THREE

- a) Explain the following terms as used in finance
 - i) Underlying asset.
 - ii) European option
 - iii) American option (6 marks)
- (b) i) Define the term “Intrinsic Value” (2 marks)
- ii) A call option of XYZ Co. has the Exercise price = Shs.115
Find the intrinsic value of the call if the current price is:
 - 1) Shs.100
 - 2) Shs.115
 - 3) Shs.125 (6 marks)
- iii) Suppose it was a put option and the facts remain as above, find its intrinsic value in the three cases above. (6 marks)

QUESTION FOUR

- a) “Forward price” should be the same for a contract with a certain delivery date as for a “Futures price” of a contract with the same delivery date. Explain. (4 marks)
- b) In practice there are a number of factors that may cause the forward and futures prices to be different. Explain any three of such factors. (6 marks)
- c) The Company for which you work has just heard that financial derivatives have just been introduced in the Nairobi Securities Exchange (NSE) and is highly motivated to buy a 12-month futures contract on a stock with a price of Shs.500. The risk free rate of interest compounded continuously is 8% p.a for all maturities. The dividends of Shs.7.5 per share are expected after 3 months, 6 months, 9 months and 12 months.

Required.

- i) Find the present value of the dividends. (6 marks)
- ii) Find the futures price F_0 (4 marks)

QUESTION FIVE

- a) What do you understand by the following terms as used with respect to a call option?
- i) In-the-money
 - ii) Out of –the-Money
 - iii) At- the- Money
 - iv) Near-the Money (8 marks)
- b) A U.S Bank has sold six month put options on £1m with a strike price of 1.6000 and wishes to make its portfolio delta neutral. If the current exchange rate is 1.6200, the risk free interest rate in the UK is 13 %per annum, the risk free interest rate in the United States is 10% per annum, and the volatility of the sterling pound is 15%.
- i) Calculate the value of the delta of the put (8 marks)
 - ii) What should the bank do to make the position delta neutral? (4 marks)