MACHAKOS UNIVERSITY

University Examinations 2021/2022 Academic Year

SCHOOL OF BUSINESS, ECONOMICS AND HOSPITALITY AND TOURISM MANAGEMENT

DEPARTMENT OF BUSINESS ADMINISTRATION AND FINANCE

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF COMMERCE

BAC 309: FINANCIAL DERIVATIVES

DATE: 26/8/2022 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

- Answer question **ONE (Compulsory)** and any other **TWO questions.**

QUESTION ONE

a) Highlight and explain the uses of Financial Derivatives (4 marks)

b) Explain the following types of Commodity derivatives:

i. Investment Commodities

ii. Consumption Commodities (6 marks)

c) You have entered into a 10 month forward contract on stock with a price of sh50.The risk free rate of interest (compounded continuously) is 6% P.a for all maturities. Dividends of shs 1.80 per share are expected after 3 months,6 months and 9months.

Required

i. Find the present value of the dividends (2 marks)

ii. Find the forward price F_0 (3 marks)

d) Futures contracts are highly standardized instruments. When developing a new contract, the exchange must specify certain features regarding the contract. State and explain five of such features. (5 marks)

e) A trader buys a call option with a strike price of Ksh.45 and a put option with a strike price of Ksh.40. Both options have the same maturity date. The call costs Ksh.3 and the put costs Ksh.4.

Draw diagrams showing the variation of the traders profit with the asset price. (6 marks)

f) The exercise price of a non-dividend paying stock is Shs.23 and its current price is Shs.25 with an implied volatility of 21%.

i. Calculate the price of a call option written on this stock with a maturity of three months given a short-term risk- free interest rate of 5%. (8 marks)

ii. Using the Put – Call Parity theorem, calculate the price of a put option on the same stock given the same risk-free interest rate. (6 marks)

QUESTION TWO (20 MARKS)

a) What do the following terms mean with respect to a put option?

i. In-the-money

ii. Out of –the-Money

iii. At- the- Money

iv. Near-the Money (8 marks)

b) Wisdom Investments Ltd. Purchased a futures contract on a coupon bearing bond whose price is Shs. 10,000. The futures contract will mature in 6 months. If a coupon payment of Shs.500 is expected after 4 months, and the 4-month and 6-month risk free interest rates are 3% p.a and 4% p.a compounded continuously, calculate:

i. The futures Price F_0 (6 marks)

ii. The amount of arbitrage profit that Wisdom Investments Ltd. locks in if any. (6 marks)

QUESTION THREE (20 MARKS)

a) Explain the following terms as used in Financial Derivatives Market. (8 marks)

i. Call option

ii. Put option

iii. Stock Index.

iv. Swaption

b) i. Explain the term 'intrinsic value'. (2 marks)

ii. A call option of XYZ Co. has an exercise price of shs 50.

Find the intrinsic value of the call if the current price is:

1) shs 40
2) shs 45
3) shs 50
4) Shs.55
5) Shs. 60 (5 marks)

iii. What do you understand by the term" Marking –to- Market"? (5 marks)

QUESTION FOUR (20 MARKS)

a) Differentiate between options and swaps (6 marks)

b) Ideal Tech Ltd has entered into a forward Rate Agreement that specified it will receive a fixed rate of 4% on a principal of shs, 1000,000 for a 3-month period starting in three years. If the 3-month floating rate is 4.5 % for the 3-month period, find the cash flow to the lender. (6 marks)

c) Explain four uses of the Greeks (8 marks)

QUESTION FIVE (20 MARKS)

a) Explain the following terms as used Derivatives Market. (6 marks)

i. Delta
ii. Vega
iii. Rho

b) Differentiate between Features of Futures and Forward Contracts. (4 marks)

c) i. A stock index currently stands at 350. The risk-free interest rate is 8% per annum (with continuous compounding) and the dividend yield on the index is 4% per annum.

Calculate a futures price for a 4-month contract written on this index. (4 marks)

ii. Identify six factors that determine the price or value of an option (6 marks)