REFORMED CHURCH UNIVERSITY

FACULTY OF COMMERCE

BACHELOR OF COMMERCE HONOURS DEGREE IN BANKING & FINANCE

DERIVATIVE SECURITIES

HBAF 204

PART 2 SEMESTER 2 EXAMINATION

TOTAL MARKS [100]

DATE: DECEMBER 2024

Time: 3 Hours

INSTRUCTIONS

1 This paper has ***six (6)*** questions

2 Answer Question One ***(1)*** and any other ***three (3)***

3 Each question carries ***25 marks***

4 Start each question on a new page

1a) Explain carefully the difference between hedging, speculation, and arbitrage.
(10)

b) A company knows that it is due to receive a certain amount of foreign currency in 4 months. What type of option contract is appropriate for hedging and give a detailed explanation? (15)

2a) A stock price is currently $50. Over each of the next two three-month periods, it is expected to go up by 6% or down by 5%. The risk-free interest rate is 5% per annum with continuous compounding.

i) What is the value of a 6 month European call option with a strike price of $51?
(7)

ii) What is the value of a 6 month European put option with a strike price of $51?
(3)

b) An option with an exercise price of $40 has three months to expiry. The risk-free interest rate is 5% per annum and the stock price is currently $36. If the standard deviation of share price is 50%, calculate the lack-Scholes values of a European call and put options on the share. (10)

c) Explain any 2 the differences between the Black-Scholes and the Binomial option pricing models. (5)

3a) With the aid of examples, discuss the uses of derivatives.
(15)

b) Explain the functions of derivative markets
(10)

4) An investor believes that there will be a big jump in a stock price, but is uncertain as to the direction. Explain 6 different strategies the investor may follow and explain the differences among them. (12)

a) Suppose that put options on a stock with strike prices $30 and $35 cost $4 and $7 respectively. How can the options be used to create:

i) A bull spread (7)

ii) A bear spread. Construct a table that shows the profit and payoff for both strategies. (6)

5a) John is asked to value a one-year European-style call option for Kunakirwa Ltd common stock which last traded at $43. Call and put option exercise price is $45; one year put option price is $4; one year Treasury bill rate is 5.50%, and time to expiration is one year.

Required

i) Calculate, using information provided the value of the European-style call option. (4)

ii) Explain the effect, if any, of an increase in short-term interest rate, an increase in stock price volatility, and a decrease in time to option expiration on the value of a call option. (9)

b) A share is trading at $20 and the risk-free rate of interest is 10% per annum, with continuous compounding. The exercise price on a European call option is $18 and time to maturity is one year.

Required

i) Estimate the theoretical minimum value of this option. (2)

ii) Assume the call option is selling at $3. Construct an arbitrage strategy to exploit each of the two scenarios where share price at the end of the year is either $21 or $16. (10)

6a) A wheat farmer argues: "I do not use futures contracts for hedging. My real risk is not the price of wheat. It is that my whole crop gets wiped out by the weather". Discuss this viewpoint. (10)

b) Suppose that zero interest rates with continuous compounding are as follows:

Maturity (years)	Rate (% per annum)
1	2.0
2	3.0
3	3.7
4	4.2
5	4.5

Required

i) Calculate forward interest rates for the second, third, fourth, and fifth years. (5)

ii) Value a Forward Rate Agreement (FRA) where you will pay 5% for the third year on $1 million. (5)

iii) Advise the Governor of the Reserve Bank of Zimbabwe about the regulatory reforms that are necessary before derivatives are embraced in Zimbabwean financial markets. (5)

END OF PAPER