

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF COMMERCE
DEPARTMENT OF BANKING
BACHELOR OF COMMERCE HONOURS DEGREE IN BANKING**

**DERIVATIVE SECURITIES
[CBA 4204]**

SUPPLEMENTARY EXAMINATION

AUGUST 2010

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

- Answer any **FOUR (4)** questions
- Start the answer to each question on a fresh page of the answer sheet.
- Indicate on your answer booklet whether you are in the conventional or parallel programme
- Show all workings
- Questions may be written in any order, but must be legibly numbered.

INFORMATION FOR CANDIDATES

- The paper contains **SIX (6)** questions.
- All questions carry equal marks [**25 marks**].
- The businesses in this question paper are intended to be fictitious.

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Turn over

QUESTION ONE

a) The 30-month interest rates in South Africa and Botswana are 3% and 8% per annum, respectively, with continuous compounding. The spot price of the South African Rand (ZAR) is Botswana Pula (BWP) 0.6500. A Botswana trader has entered into a 30-month foreign exchange forward contract. Assume that the trader can either borrow BWP 1000 or ZAR 1000.

- i. Calculate the 30-month forward exchange rate. **[3 marks]**
- ii. Suppose the agreed forward price for a contract deliverable in 30 months is BWP 0.800. Outline an arbitrage strategy that can be used by the trader, showing the amount of riskless profit available. **[8 marks]**
- iii. Suppose the agreed forward price for the contract is BWP 0.6800. Outline an arbitrage strategy that can be used by the trader in this case. Show the maximum profit from the strategy. **[8 marks]**

b) Explain how the “Cost of Carry Model works in the pricing of forward contracts. **[6 marks]**

TOTAL [25 MARKS]

QUESTION TWO

- a) Distinguish between the Binomial Option Pricing Model and the Black-Scholes Model. **[5 marks]**
- b) A stock price is currently \$50. It is known that at the end of 6 months, it will be either \$60 or \$42. The risk-free interest rate with continuous compounding is 12% per annum.
 - i) Calculate the value of a European call option with strike price \$48. **[10 marks]**
 - ii) Calculate the value of a European put option with strike price \$48. **[10 marks]**

TOTAL [25 MARKS]

QUESTION THREE

- a) Why do financial engineers use the “no-arbitrage” principle in valuing derivative securities? **[5 marks]**
- b) With the aid of clear examples, explain the major uses of derivative securities. **[12 marks]**

c) Despite concerted efforts to establish a vibrant derivatives market in Zimbabwe's financial system prior to the 2003/2004 banking crisis, the market remained thin and undeveloped (Chibisa, 2005). Why did the market remain thin and undeveloped? **[8 marks]**

TOTAL [25 MARKS]

QUESTION FOUR

a) State and explain 4 major differences between a forward contract and a futures contract. **[6marks]**

b) Futures contracts are largely credited with the ability to eliminate problems of illiquidity and counter-party risk. Identify and explain 4 mechanisms used to achieve this. **[8 marks]**

c) Suppose that on 1 February 2009, you enter into a short futures contract to sell July silver for \$1.40 per ounce on the South African Futures Exchange. The size of the contract is 100 ounces. The initial margin is set at 10% and the maintenance margin at 5% of the futures price. Suppose the futures prices on the silver from the end of 1 February 2009 to 5 February 2009 are \$1.38; \$1.30; \$1.28; \$1.40 and \$1.50 per ounce, respectively. Calculate the gain (loss), cumulative gain (loss), margin account balance, and variation margin on a daily basis. Tabulate your answers. **[11 marks]**

TOTAL [25 MARKS]

QUESTION FIVE

There have been calls for the re-introduction of derivatives trading in Zimbabwe. Evaluate the preparedness of Zimbabwean financial markets to trade in derivative securities. **[25 marks]**

TOTAL [25 MARKS]

QUESTION SIX

a) State and explain two major benefits of swaps. **[5 marks]**

b) Describe each of the following option trading strategies. In each case, comment on the trader's view about the market and explain the pay-off at option expiration.

i) Protective put **[5 marks]**

ii) Covered call **[5 marks]**

iii) Bull spread **[5 marks]**

iv) Straddle. **[5 marks]**

TOTAL [25 MARKS]