



WI-2-60-1-6

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2017/2018**

**FOURTH YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN FINANCIAL ENGINEERING**

**STA 2423 - FINANCIAL RISK MANAGEMENT**

**DATE: AUGUST 2018**

**TIME: 2 HOURS**

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***INSTRUCTIONS TO CANDIDATES:***

- 1. Answer questions ONE and any two questions*
  - 2. Be neat and show all your workings*
  - 3. All questions except question one carry equal marks*
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This paper consists of 3 printed pages

STACS Examination board 2017/2018

### QUESTION ONE (30 Marks)

- (a) As a financial risk manager, discuss carefully and rigorously how you would help a firm manage their risk. (6 Marks)
- (b) Discuss the three main sources of financial risk in an organization. (4 Marks)
- (c) With elaborate calculation, find the risk adjusted capital (RORAC) for the following business units and advice which of the business units management of the organization should favor and why. (5 Marks)

Business	Return and/or Profit	EC Estimates	RORAC
Unit 1	\$50 millions	\$100 millions	
Unit 2	\$30 millions	\$120 millions	

- (d) A corporation is faced with the decision to choose between the two following projects:

Project	Investment	Perpetual Annual Cash Flow	Cash Flow at Risk
A	100	20	50
B	80	55	200

Assuming that there is no systemic risk and the projects are mutually exclusive, under what circumstances would project A be selected over project B? (5 Marks)

- (e) Define Value at Risk (VaR). (2 Marks)
- (f) Outline the general assumptions of using the VaR model. (2 Marks)
- (g) Suppose that the duration of a Bata bond with a current price of \$120 and a daily standard deviation in the absolute level of interest rates is 0.4% is 7 years, what is the VaR of Bata bond? (6 Marks)

### QUESTION TWO (20 MARKS)

- (a) Suppose a corporate bond has a face value of USD1, 000, making semi-annual interest payments for 2 years, after which the bond matures and the principal must be repaid, what would be the value of the corporate bond with annual interest rate of 5%. Assume a Yield to Maturity of 3%. (20 Marks)

### QUESTION THREE (20 MARKS)

- (a) Assume a \$1,000 face value bond that pays a 6% coupon and matures in three years. Interest rates are 6% per annum with semi-annual compounding. The bond pays the coupon twice a year, and pays the principal on the final payment. Given this, the following cash flows are expected over the next three years:

Period	1	2	3	4	5	6
Cash Flow (\$)	30	30	30	30	30	1,030

Calculate the Macaulay duration for the cash flow.

(10 Marks)

- (b) Consider a 2-year, 6% semi-annual bond currently yielding 5.2% on a bond equivalent basis. If the Macaulay Duration of the bond is 1.92 years, what is its approximate Modified Duration for the bond?

(10 Marks)

### QUESTION FOUR (20 MARKS)

- (a) Consider you are setting up a new bank and your total investment capital is made up of KES 5,000,000 of capital from investors who want a share of profit (shareholders) and KES 95,000,000 of debt from people who want relatively safe return of their money at 5% interest rate. Suppose you then buy a KES100,000,000 of corporate bond from Safaricom and Safaricom promises to pay back (with a return rate of 6%) in one year time. Calculate the return on equity;
- If Safaricom does not default at 6% rate of return (10 Marks)
  - If Safaricom defaults by 4%. (10 Marks)