



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

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AUGUST – DECEMBER 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND ACTUARIAL SCIENCE

REGULAR PROGRAMME

ACS 100: INTRODUCTION TO ACTUARIAL SCIENCE

Date: DECEMBER 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

- Q1. a) Define the following terms
- i) Life table
 - ii) Pension
 - iii) Actuary
 - iv) Life insurance **(4 marks)**
- b) What is a claim? Hence or otherwise state the objective of claim settlements **(5marks)**
- c) Which are the sources of demographic data during research **(5marks)**
- d) Show that $tq_x = \frac{q_x}{2+m_x}$ **(4marks)**
- e) Explain meaning of reinsurance **(2 marks)**
- d) Discuss the two basic types of reinsurance in the modern Kenya **(3 marks)**
- e) Explain any two types of pension common in the Kenyan market **(4marks)**
- f) State the types of expenses that an insurance company that incur when operating in the Kenyan market **(4 marks)**

- Q2. a) The actuarial profession has defined acceptable approaches to certain tasks carried out by actuaries in professional standards. Which are some of the matters covered in these standards? **(2marks)**
- b) Which assumption do we make when assessing the probability of ruin for insurance company? **(4 marks)**
- c) State and briefly explain some of the most important insurance company operations **(6marks)**
- d) Derivatives can be used as a form of insurance, highlight some of the most commonly used derivatives **(4 marks)**

- Q3. a) Fill in the table below **(5 marks)**

Age x	l_x	d_x	p_x	q_x
30	94726			
31			0.99839	
32	94425			0.00167
33		164		
34			0.99817	
35		182		

Using the table;

- i) What is the proportion aged 31 expected to live to age 35 **(3 marks)**
- ii) What is the average number of persons who might be expected to die between age 31 and 35 out of 3000 persons aged 30 now **(5 marks)**
- b) Using the actuarial life tables, what is the chance that a male child born to a mother aged 31 and a father aged 33 will live be alive 2 years but orphaned by both parents **(7 Marks)**
- Q4. a) Discuss the five principles of insurance **(10 marks)**
- b) What are the requirement of risks for it to be insurable? **(5 marks)**
- c) State steps involved in management of risk **(5 marks)**
- Q5. a) Briefly explain property insurance, casually insurance and motor insurance **(10marks)**
- b) State and briefly explain products of life insurance. **(10 marks)**

END