

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS  
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN  
ACTUARIAL SCIENCE

ACMT 101: INTRODUCTION TO ACTUARIAL SCIENCE

STREAMS: BSC

TIME:2 HOURS

DAY/DATE: TUESDAY 17/12/2024

11.30 A.M. –1.30 P.M.

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**Question One**

- a) Define each of the following terms as used in Insurance.
- i. Underwriting. (2 marks)
  - ii. Renewal. (2 marks)
- b) You are offered a discount on a purchase where you pay Kshs.900 today instead of Kshs.1,000 in one year. What is the effective annual discount rate being offered? (4 marks)
- c) Distinguish between a Term Assurance and an Endowment Assurance. (4 marks)
- d) Discuss the benefits of investment for individuals and businesses. (4 marks)
- e) Discuss what is entailed in the below processes of the Actuarial Control Cycle.
- i. Identifying the risks. (3 marks)
  - ii. Monitor and review. (3 marks)
- f) Given a dataset of insurance claims amounts, calculate the mean, median and standard deviation. Dataset: {1500, 2300, 1800, 2500, 2000, 2200, 1750}. (8 marks)

**Question Two**

- a) Explain what the notation  $l_a$  is in the life table. (3 marks)
- b) Actuarial Science encompasses various practice areas where actuaries apply their expertise. Write down five key practice areas within Actuarial Science. (5 marks)
- c) Define multistage models and describe any two applications in real-world scenarios. (6 marks)

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- d) Describe the three categories of Marine Insurance.  
(6 marks)

### Question Three

- a) Define what is Insurance. (2 marks)
- b) A person invests Kshs.10,000 in a savings account that earns an annual interest rate of 5%, compounded annually. Calculate the amount in the account after 5 years. (3 marks)
- c) What is the present value of Kshs.15,000 to be received 10 years from now if the discount rate is 6% per annum? (3 marks)
- d) Explain the principle of indemnity and provide an example. (4 marks)
- e) Discuss four key skills and qualifications required to become an actuary. (8 marks)

### Question Four

- a) Briefly explain what is a personal pension plan? (2 marks)
- b) Identify and explain the key components typically found in a life table. (8 marks)
- c) Discuss the specific advantages that life insurance provides to policyholders and their beneficiaries. (10 marks)

### Question Five

- a) Explain what bonds are and how they differ from equities in terms of risk and return characteristics. (6 marks)
- b) The Actuaries' Code outlines several fundamental principles that guide actuaries in their professional conduct. List the principles which Members must observe to support the profession in acting in the public interest. (6 marks)
- c) Outline the four main strategies for managing risks. Provide examples of each. (8 marks)
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