

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

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

ACMT 101: INTRODUCTION TO ACTUARIAL SCIENCE

STREAMS: BSC (ACTUARIAL SCIENCE)

TIME: 2 HOURS

DAY/DATE: TUESDAY 02/02/2021

11.30 A.M – 1.30 P.M.

---

**SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION**

**QUESTION ONE**

- a) Discuss the concept of underwriting as used in insurance, explaining why it is necessary to perform underwriting while writing new contracts (5 marks)
- b) One characteristic feature of temporary term insurance contracts is that they are convertible once they expire. Explain two methods of conversion commonly used. (4 marks)
- c) An insurance contract is a legally binding document between various parties and participants. Discuss, giving suitable illustrations, the various parties and participants in a:
- i. Life insurance contract
  - ii. General insurance contract (6 marks)
- d) Discuss five objectives of financial management in a business setting (5 marks)
- e).List and explain the 3 structured ways of planning/saving for retirement (6marks)
- f)What is a life table? How are life-tables constructed? (4 marks)

**SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION  
QUESTION TWO**

- a) Outline the roles of actuaries in investment/financial services sector (4 marks)
- b) Explain any four options of treatment of risk in the Actuarial control cycle (6 marks)
- c) List and distinguish the five broad types of Life Insurance Covers we have in Kenya. Give your answers with regard to timing of payments. (10 marks)

**QUESTION THREE**

- a) The Actuarial Control Cycle (ACC) is a specific business model which describes the fundamental nature of actuarial work. With the aid of a diagram, explain in details the steps followed in the ACC (7 marks)
- b) Insurers often perform an investigation of the events leading to a claim on a policy. Explain the reasons why this is necessary (3 marks)
- c) Discuss six characteristic features that insurers generally require so as to accept to provide cover for given risks (6 marks)
- d) Write out the notation for force of transition or transition intensity between states  $i$  and  $j$  at age  $x$ . (1 mark)
- e) Let  $f(x) = x^{-4}$  find  $f^J(x)$ . (1.5marks)
- f). Evaluate  $\int 4x^6 - 2x^3 + 7x - 4 \, dx$  (1.5 marks)

**QUESTION FOUR**

- a) In return for a single payment of 1,000 a building society offers the following alternative benefits:
- A lump sum of 1,330 after three years
  - A lump sum of 1,550 after five years, or
  - Four annual payments, each of amount 425, the first payment being made after five years.
- i) Write down an equation of value for each savings plan and find the yield for each. (6 marks)
- ii) Assume that an investor opts for the first plan and that after three years he invests the proceeds of the plan for a further two years at a fixed rate of interest. How large must this rate of interest be in order for him to receive 1,550 from this further investment. (6 Marks)
- iii) Assume that an investor opts for the second plan and that after five years he uses the proceeds of the plan to buy a level annuity payment being calculated on the basis of a fixed interest rate. How large must this rate of interest be in order for the annuity payment to be 425 (3 marks)
- b) Discuss three broad decision functions of a financial manager in a business (5 marks)

**QUESTION FIVE**

a) List and explain 2 types of shares (4 marks)

b) Discuss 4 basic characteristics of property as an investment instrument. (8 marks)

c) What are the advantages of investment? (4 marks)

d) Outline 4 ethical practices that professional actuaries are expected to uphold. (4 marks)

---