

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR 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: FRIDAY 18/12/2020

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- Answer **Question 1** and **Any Other Two** questions.
- Mobile phones are not allowed in the examination room.
- You are not allowed to write on this examination question paper.

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE

- a) Outline 4 reasons why to take insurance (4 marks)
- b) Define what is an annuity (2 marks)
- c) List and briefly explain any 3 types of risk? (6 marks)
- d) Outline 3 ethical practices that professional actuaries are expected to uphold. (6 marks)
- e) What is Professional Indemnity Insurance? (2 marks)
- f) Explain what the notation ${}_t p_x^{\text{ii}}$ mean? (2 marks)
- g) Let $f(x) = 2x(x^2 - 5x + 7)$. Evaluate the derivative of f at 2. (4 marks)
- h) State any 4 financial instruments available for an investor in Kenya (2 marks)
- i) What are the meanings of the below life table notations (2 marks)
 - i) ${}_t q_x$
 - ii) p_x

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO

a) Discuss in details the five basic principles of Insurance (10 marks)

b) Let X be a continuous random variable with PDF

$$f_X(x) = 2x \quad 0 \leq x \leq 1$$

Find the expected value of x (4 marks)

c) An investor deposits Kshs.10,000 in a bank account that pays compound interest at a rate of 5% *pa.*

i) What will the deposit have accumulated to after 6 years? (3 marks)

ii) Evaluate the accumulation factor $A(0, 6)$ (3 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 (14 marks)

b) Explain any four options of treatment of risk in the Actuarial control cycle (6 marks)

QUESTION FOUR

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? (8 marks)

QUESTION FIVE

a) The following is an extract from the English life table No.15 males

Age(x)	l_x	dx
40	20,000	35
41	19,965	38
42	19,927	42
43	19,885	46
44	19,839	50
45	19,789	55
46	19,734	61

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Evaluate the following life contingency functions from the table above:

- i. l_{47} (1 mark)
 - ii. ${}_5p_{42}$ (up to 5 decimal points)(2 marks)
 - iii. ${}_5q_{41}$ (up to 5 decimal points)(2 marks)
- b) 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)
- c) List 5 risks covered under Travel Insurance. (5 marks)
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