**CHUKA**                                                          **UNIVERSITY**

## UNIVERSITY EXAMINATIONS

### CHUKA & THARAKA

**FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS**

**ACMT 101: INTRODUCTION TO ACTURIAL SCIENCE**

**STREAMS:   BSC (ACMT)**                                **TIME: 2 HOURS**

**DAY/DATE:  WEDNESDAY 11/12/2019**                  **11.30 A.M. – 1.30 P.M.**

**INSTRUCTIONS:**
- **Answer question ONE and any other two questions**
- **Do not write on the question paper**

**QUESTION ONE (30 MARKS)**

(a)    Given $F_o(t) = 1 - \left(1 - \frac{t}{125}\right)^{\frac{1}{6}}$ for $0 \leq t \leq 125$ calculate the probability that a new born

      life survives beyond age 40                                                          [3 marks]

(b)    State six criteria that risk event need to meet for it to be insurable          [3 marks]

(c)    For most life insurance companies why are premium paid in advance rather than in one

      years time?                                                                                      [3 marks]

(d)    Consider an actuary aged exactly 49 years old. Suppose that she dies when she is aged 76

      years and 197 days old. What is the value of $T_{40}$ and $K_{40}$ for this person.      [4 marks]

(e)    List four main risks relating to life insurance contracts                          [4 marks]

(f)    State two main categories of pension scheme                                        [2 marks]

(g)    State four investment avenue available for an investor in Kenya.                  [4 marks]

(h)    In general and life insurance policy give four example of exclusions              [4 marks]

(i)    State three factors considered by an actuary when computing benefits of a member of

      defined benefit scheme                                                                  [3 marks]

**QUESTION TWO (20 MARKS)**

(i)     For general insurance list four main possible risks factors for a comprehensive private motor policy                                                                              [4 marks]

(ii)    Discuss eight main roles of an actuary in general insurance          [16 marks]


**QUESTION THREE (20 MARKS)**

(i)     Why do insurers generally require evidence of health from a person applying for a life insurance but not for an annuity                                                       [3 marks]

(ii)    List three major item that will be considered when pricing of life insurance contract                                                                                               [3 marks]

(iii)   Discuss four reasons why life insurance contracts are important to the consumer                                                                                               [4 marks]

(iv)    State and explain five types of life insurance products               [10 marks]


**QUESTION FOUR (20 MARKS)**

(a)     Describe the risk management process                                    [12 marks]

(b)     State and describe four financial instruments available in the market issued or used by companies                                                                              [8 marks]

**QUESTION FIVE (20 MARKS)**

Given the distribution function $F_o(t) = 1 - \left(1 - \frac{t}{100}\right)^{\frac{1}{5}}$ for $0 \leq t \leq 100$

**Calculate;**
  (i)    The probability that a newborn life dies before age 50          [5 marks]

  (ii)   The probability that  a life aged 40 survives to at least age 80   [8 marks]

  (iii)  The probability that a life aged 40 dies between age 80 and 90   [9 marks]


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