CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

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

ACMT 211: COMPUTATIONAL METHODS AND DATA ANALYSIS II

STREAMS: BSC   **TIME: 2 HOURS**

DAY/DATE: MONDAY 28/08/2023   **2.30 P.M. – 4.30 P.M**

QUESTION ONE

a) List 3 limitations of tabulation.   (3 marks)

b) Calculate LU decompositions for the matrix below.   (7 marks)

$$A = \begin{bmatrix} 2 & 1 & -4 \\ 2 & 2 & -2 \\ 6 & 3 & -11 \end{bmatrix}$$

c) Check your answer in part b, by multiplying out LUto show that the product equals A.
(4 marks)

d) List the six factors that the flow of an effective questionnaire is dependent Upon? (6 marks)

e) Solve the following system of equations using Gauss elimination method.   (10 marks)

$x + y + z = 2$

$x + 2y + 3z = 5$

$2x + 3y + 4z = 11$

QUESTION TWO

a) What is the difference between a poll and a survey?   (2 marks)

b) What function do the following strings perform?   (3 marks)

      a. strchr(s1, ch);
      b. strstr(s1, s2);
      c. strcmp(s1, s2);

c) Highlight 7 key parts of an ideal table. (7 marks)

d) Find all eigenvalues of B (8 marks)

$$B = \begin{bmatrix} 11 & -8 & 4 \\ -8 & -1 & -2 \\ 4 & -2 & -4 \end{bmatrix}$$

QUESTION THREE

a) Define what an array is and explain the basic operations supported by an array. (6 marks)

b) What is a queue? How is it different from a stack? (4 marks)

c) Discuss the five sections of a questionnaire. (10 marks)

QUESTION FOUR

a)List and explain two non-linear data structures. (4 marks)

b) List six advantages of linked lists. (6 marks)

c) Find all λ's and **x**'s (10 marks)

$$A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$$

QUESTION FIVE

a) When do we say that a system of equations is inconsistent. (2 marks)

b) Explain six objectives of tabulation (6 marks)

c) What is the difference between to enqueue and to dequeue. (4 marks)

d) Highlight eight Limitations of survey method of data collection. (8 marks)