

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

ACMT 111: COMPUTATIONAL METHODS AND DATA ANALYSIS I

STREAMS: ACMT

TIME: 2 HOURS

DAY/DATE: FRIDAY 25/04/2025

11.30 A.M. – 1.30 P.M.

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**INSTRUCTIONS**

**QUESTION ONE (30 MARKS).**

- A. State five concepts of computational methods. **(5 Marks)**
- B. What is an Array. Discuss two advantages and two disadvantages of arrays **(5 marks)**
- C. Explain two types of optimizations **(4 marks)**
- D. Tasked to come up with a survey, what are the six characteristics of a survey with a good design? **(6 marks)**
- E. Suppose you have the following data points: (1,2), (2,4), (3,6), estimate  $y$  at  $x=2.5$ , using a linear interpolation. **(5 marks)**
- F. Discuss two measures of correlation and state their advantages. **(5 marks)**

**QUESTION TWO (20 MARKS).**

- A. What is hypothesis testing in data analysis. Explain 7 steps in hypothesis testing. **(10 marks)**
- B. Explain the Bayesian Theorem. Give four merits and three demerits of the Bayesian Theorem. **(6 marks)**
- C. Discuss four types of data bases used in computational methods. **(4 marks)**

**QUESTION THREE (20 MARKS).**

- A. Define data reprocessing and discuss 7 steps in data reprocessing. **(10 marks)**
- B. Future selection is a crucial method in data set. What is future selection? Discuss four methods used in future selection. **(10 marks)**

**QUESTION FOUR (20 MARKS).**

- A. State five concepts of machine learning. **(10 marks)**
- B. Discuss five models of computational modelling. **(10 marks)**

**QUESTION FIVE (20 MARKS).**

- A. Elaborate five applications of data visualizations. **(10 marks)**
  - B. Explain 10 advantages of questionnaires. **(10 marks)**
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