



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PHYSICAL AND BIOLOGICAL SCIENCES

UNIVERSITY ORDINARY EXAMINATION

2021/2022 ACADEMIC YEAR

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR, BACHELOR OF
SCIENCE IN ANALYTICAL CHEMISTRY**

ACH 311: CHEMICAL TOXICOLOGY

DURATION:2 HOURS

Instructions to candidates:

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

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) Explain the meaning of the following concepts as used in chemical toxicology. (6 marks)
- i) Xenobiotics
 - ii) Exposure
 - iii) Acute toxicity
 - iv) Chronic toxicity
 - v) Dose response relationship
 - vi) Tetratogen
- b) Describe in details the criteria for classification of a toxicant. (8 marks)
- c) Explain any three sources of uncertainty in toxicant risk assessment. (6 marks)
- d) Describe the process of toxic kinetic and dynamic as used in toxicology. (4 marks)
- e) With relevant example explain any three chemical factors that may affect toxicity of pesticides. (6 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- 2.a). Discuss three factors that determine the toxicity of a given chemical compound. (6 marks)
- b) Explain the difference between bioaccumulation and biotransformation. (4 marks)
- c) Distinguish between the following terms “threshold” and “biological limit” as used in toxicology. (4 marks)
- d) Describe the routes of toxicant exposure and their impact on health. (6 marks)

QUESTION THREE (20 MARKS)

3. a). The “dose make the poison”. Discuss this statement using the dose-response relationship curve. (6 marks)
- b) Discuss the general requirements for choosing a test species for use in a toxicity test. (8 marks)
- c) Briefly discuss any three ecological factors that may increase the toxicity of a compound. (6 marks)

QUESTION FOUR (20 MARKS)

4. a). Differentiate between frequency response curve and cumulative response curve. (4 marks)
- b) Using appropriate examples discuss stages of risk assessment model. (10 marks)
- c) Examine the underlying factors influencing absorption of chemical substances through the skin. (6 marks)