



MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF HEALTH SCIENCES

THIRD YEAR /FOURTH YEAR FIRST/SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (PUBLIC HEALTH)

HPH309/407: ENVIRONMENTAL TOXICOLOGY

DATE:

TIME:

Instructions:

This paper consists of two sections A and B

SECTION A

Specific Instructions

- **This section has one question**
- **The question is compulsory**
- **The question is 30 marks**

QUESTION ONE (30 MARKS)

- a) Define the following terms (3 marks)
- Toxicity
 - Toxicant
 - Dose

- b) Explain four (4) uses of environmental risk assessment (4 marks)
- c) Differentiate between chronic and acute toxicity (2 marks)
- d) Using appropriate examples, explain the concept that “all substances are poisonous and there is none which is not poison” (3 marks)
- e) With the help of a diagram, explain any three (3) factors influencing the dose-response curve (3 marks)
- f) Explain how aquatic and terrestrial ecosystems are affected by toxic chemicals in the environment (4 marks)
- g) Identify the routes of exposure of toxins to humans (3 marks)
- h) Identify the major sources of naturally occurring toxins (3 marks)
- i) Explain how exposure to toxic chemicals affects the reproductive health system (5 marks)

SECTION B:

Specific Instructions

- **This Section has four (4) questions**
- **Answer any two (2) questions**
- **Each question is 20 marks**

QUESTION TWO (20 MARKS)

- a) Based on the expected effects caused by individual chemicals, discuss the basic types of toxic interactions (10 marks)
- b) Discuss absorption and distribution aspects of toxicokinetics (10 marks)

QUESTION THREE (20 MARKS)

- a) Discuss how modern agriculture has contributed to acute and chronic exposure of toxic chemicals in our environment (10 marks)

- b) Write short notes regarding cadmium and mercury environmental toxicants under the following subtitles: (10 marks)

- i) Possible sources of exposure
- ii) Modes of entry into the body
- iii) Two major health effects
- iv) Name of associated disease

QUESTION FOUR (20 MARKS)

- a) Discuss historical perspectives and major milestones of environmental toxicology as a fundamental science of poisons (10 marks)
- b) Discuss the toxicity testing methods used in toxicology (10 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the potential factors that influences toxic effect of a chemical substance in an organism (10 marks)
- b) Discuss the role of biological monitoring in environmental pollution control prevention (10 marks)