

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF BACHELOR OF  
SCIENCE IN CHEMISTRY, BACHELOR OF SCIENCE INDUSTRIAL  
CHEMISTRY AND BACHELOR OF SCIENCE**

**CHAL 451: ENVIRONMENTAL TECHNOLOGY AND HEALTH****STREAMS: BSC****TIME: 2 HOURS****DAY/DATE: THURSDAY 25/03/2021****11.30 A.M. – 1.30 P.M.*****INSTUCTIONS***

- *Answer question one and any other two questions*

**QUESTION ONE (30 MARKS)**

- (a) i) Briefly explain the term environmental Health (2 marks)  
 ii) Briefly discuss three basic disciplines of environmental health (6 marks)
- (b) Explain the following terms (8 marks)  
 i) Mutagenic ii) carcinogenic iii) biomarker iv) dose-response relationship
- (c) Briefly explain three factors that influence toxicity (6 marks)
- (d) i) Define biotransformation of toxicants (2 marks)  
 ii) Write the product sequence in the biotransformation of ethanol in the liver (2 marks)
- (e) Briefly explain two toxic metals of concern to environmental health from industrial pollution source (4 marks)

**QUESTION TWO (20 MARKS)**

- (a) Briefly discuss three environmental health concerns (6 marks)
- (b) i) Define ecotoxicology (1 mark)  
 ii) List four main objectives of ecotoxicology (4 marks)

- (c) Explain three stages in the risk assessment process (6 marks)
- (d) Briefly discuss asbestosis as an environmental disease (3 marks)

**QUESTION THREE (20 MARKS)**

- (a) Briefly discuss three emerging issues in environmental health (4 marks)
- (b) Differentiate between the following terms in environmental health
  - (i) Harm or damage (2 marks)
  - (ii) LD<sub>50</sub> and LC<sub>50</sub> (2 marks)
  - (iii) Toxi dose Low (TDLO) and Toxic Concentration low (TCLO) (2 marks)
  - (iv) Hazard assessment and risk assessment (2 marks)
- (c) Discuss three industrial sources to public exposure to pollution (2 marks)
- (d) Define the following terms
  - (i) Biodegradation (2 marks)
  - (ii) Bioaccumulation (2 marks)

**QUESTION FOUR (20 MARKS)**

- (a) Briefly discuss two routes of expose of toxicants to the human body (4 marks)
  - (b) Briefly discuss the following
    - (i) Silicosis (3 marks)
    - (ii) Occupational Asthma (3 marks)
    - (iii) Fume fevers ( 3 marks)
  - (c) List three issues necessary for undertaking a risk assessment (4 marks)
  - (d) Discuss two types of risk assessment ( 4 marks)
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