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# KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR**

**FOURTH YEAR SECOND SEMESTER  
SPECIAL/SUPPLEMENTARY EXAMINATIONS**

**FOR THE DEGREE OF BSC (SCIENCE)**

**COURSE CODE: SCH 450**

**COURSE TITLE: CHEMICAL TOXICOLOGY & MANAGEMENT**

**DURATION: 2 HOURS**

**DATE: 16/2/2021**

**TIME: 2-4PM**

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## INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of 3 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

**Answer Question ONE and ANY other TWO Questions. (70Marks)**

**Question 1(30MARKS)**

- 1a. What is Toxicological Chemistry. (2 marks)
- b. Name the four main sphere of the earth. (2 marks)
- c. State the meaning of the following terminologies as used in toxicological chemistry
- i) Toxic substances (2 marks)
  - ii) Chemodynamics (2 marks)
  - iii) Diffusion coefficient (2 marks)
  - iv) Chemical transport (2 marks)
- d. Define the term CFC and write the formulas for the most common CFCs. Then give two effects of CFCs. (5 marks)
- e. i. Define Air Quality (2 marks)
- ii. State two air quality standards (3 marks)
- f. Differentiate between the following (4 marks)
- a) Biodegradable and non-biodegradable substances.
  - b) Chemiluminescence and phosphofluorence
- h. State four major pathways by which toxic chemicals enter ecosystem. (2 marks)
- i. Derive the two mechanism used in the destruction of ozone (5marks)

**QUESTION 2 (20 MARKS)**

- 2a). State five examples of toxic chemicals in the environment. (5 marks)
- b). Explain the biochemical effects under the following (10marks)
- i. Pesticides
  - ii. Lead
  - iii. Detergents
  - iv. Fertilizers
  - v. Chromium
- c). Explain the fate of chemicals in the environment. (5marks)

**QUESTION 3 (20 MARKS)**

- 3a). Briefly explain the effect of air pollution on the environment. (5marks)
- b). Explain the health hazards arising from food additives and chemicals formed during food processing (5marks)
- c). Explain the principles that help to control pollution. (5 marks)

d). Explain why burning of waste should be discouraged (5marks)

**QUESTION 4 (20 MARKS)**

4a). Explain five functional components of the waste management system (10 marks)

b). Differentiate between photochemistry and green chemistry (4 marks)

c). Describe the techniques of controlling air pollution (6marks)

**QUESTION 5 (20 MARKS)**

5a). Hydroxyl ( $\text{HO}^*$ ) is the single most important species in the atmosphere.

- i. State and explain the process of formation of hydroxyl ( $\text{HO}^*$ ) ion in the atmosphere (5 marks)
- ii. Hydroxyl radical is phrased as "The Atmosphere's Detergent" because it removes chemicals from the atmosphere. Using relevant examples, Explain how the hydroxyl radical removes the chemicals from the atmosphere. (5 marks)
- iii. Explain what the Chapman mechanism of atmospheric reaction is. Use relevant reaction mechanisms (10marks)