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KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

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

FOR THE DEGREE OF BSc (CHEM)

COURSE CODE: SCH 450

COURSE TITLE: CHEMICAL TOXICOLOGY AND MANAGEMENT

DATE: 10/1/2022

TIME: 2-4PM

INSTRUCTIONS TO CANDIDATES:

TIME: 2 HOURS

ANSWER QUESTION ONE AND ANY TWO OF THE REMAINING

KIBU OBSERVES ZERO TOLERANCE TO examination cheating

Question one (30marks)

- (a) What is selective toxicology (2 marks)
- (b) Briefly describe the following sub- disciplines of Toxicology. (2marks)
- Environmental toxicology (2marks)
 - Food toxicology (2marks)
 - Clinical toxicology (2marks)
- (c) Briefly describe what you understand by the following classification of toxic agents (2 marks)
- Solvents and Vapors (2 marks)
 - Plants toxins (2 Marks)
 - Animal toxins (2 Marks)
- (d) Distinguish between co- carcinogens and occupational carcinogens giving two examples in each case (4 mark)
- (e) Using chemical equations demonstrate how the following metal ions Hg^{2+} and As^{3+} inhibits enzyme functioning (3 Marks)
- (f) Explain the biochemical effect of carbon monoxide (5 mark)
- (g) What is garbage? (1 Marks)
- (h) Describe negative effects of garbage (3marks)

Question two (20 marks)

- (a) Explain why zero pollution is an unrealistic goal (6 marks)
- (b) Explain the need for studying chemical fate and transport of environmental contaminants (6 marks)
- (c) Distinguish between recyclable and non-recyclable wastes giving two examples in each (4 marks)
- (d) Briefly discuss the following chemical transport methods (4 marks)
- Turbulent
 - Dispersion

Question three (20 marks)

- (i) List any five advantages of recycling (5marks)
- (ii) Briefly discuss each of the following structural aspect of chemical speciation (6 Marks)
- Isotopic composition
 - Electronic and oxidation states
 - Inorganic compounds and complexes
- (iii) Discuss the biochemical effects of the following (9 Marks)
- Cadmium
 - Sulphurdioxide
 - Ozone

Question Four (20 marks)

- (a) What are the three main objectives of design for environment (DFE) (3 marks)
- (ii) State the principles of industrial ecology (2Marks)
- (iii) Compare between qualitative and quantitative methods used in design for environment (DFE) (3 Marks)
- (iv) (a) What is pollution? (2 marks)
- (c) Briefly discuss the following in relation to pollution (2marks)
- Pollution control (2marks)
 - Remediation (2marks)
 - Restoration (2marks)
- (d) Discuss the following basic ways of preventing people from polluting (4 marks)
- Persuasion
 - Regulation

Question Five (20 marks)

- (a) Briefly describe the effects of each of the following teratogens (6Marks)
- Aspirin
 - Lead

iii. Cocaine

(b) Describe descriptive Toxicology

(10Marks)

(c) (i) Explain what are allergens

(1mark)

(ii) State three sources of allergens

(3 marks)