



**KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2016/2017 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS**

**FOR THE DEGREE  
OF  
BACHELOR OF EDUCATION SCIENCE**

**COURSE CODE: SCH 350**

**COURSE TITLE: ENVIRONMENTAL CHEMISTRY**

**DATE: 20<sup>TH</sup> SEPTEMBER 2017 TIME: 11:30AM - 1:30Pm**


---

**INSTRUCTIONS TO CANDIDATES**

Answer QUESTION 1 and any other TWO questions

TIME: 2 Hours

KIBABII UNIVERSITY observes ZERO tolerance to examination cheating





### QUESTION ONE: (30 MARKS)

- a) State the meaning of the following terminologies as used in environmental studies.
- i. Anthropogenic chemicals[1 marks]
  - ii. Particulate [1 marks]
  - iii. Green Chemistry[1 marks]
  - iv. Tropospheric sink [1 marks]
- b) Explain two benefits of studying environmental chemistry? [2 marks]
- c) State any three most important sources of methane [3 marks]
- d) Differentiate between troposphere and atmosphere [2 marks]
- e) Name any three types of pesticides and state what they work on[3 marks]
- f) Explain the process for the formation of photochemical smog. [2 marks]
- g) Differentiate between a tornado and a hurricane [2 marks]
- h) Explain the main benefit of microbes in the soil[2 mark]
- i) Explain the similarity and the difference between LD<sub>50</sub> and LOD<sub>50</sub>[4 marks]
- j) Explain briefly the stages of drinking water purification process [4 marks]
- k) Write a balanced equation for the oxidation of ammonia to nitrate ion by O<sub>2</sub> in an alkaline solution[2 marks]

### QUESTION TWO: (20 MARKS)

- a) Explain how the Effective CO<sub>2</sub> concentration differs conceptually and numerically from real CO<sub>2</sub> concentration in air. [4 marks]
- b) Discuss three effects of human health that scientists believe will result from ozone depletion [6 marks]
- c) PCBs are a group of organochlorine chemicals that became a major environmental concern in the 1980s. Answer the following questions in relation to PCBs.
- i. What does PCB stand for? [2 marks]
  - ii. Draw a structural diagram of a representative PCB molecule. [3 marks]



- iii. Are PCBs acutely toxic to humans? What is the basis for health concerns about them? [2 marks]
- iv. What were the two main uses for PCBs? What is meant by an open use? [3 marks]

**QUESTION THREE: (20 MARKS)**

- a) Polynuclear Aromatic Hydrocarbons (PAHS) are common air pollutants and are strongly implicated in degradation of human health in some cities. Use five examples to explain how PAHs are environmental pollutants [10 marks]
- b) What is an acid rain and how does it form? Discuss the main ecological effects of acid rain [10 marks]

**QUESTION FOUR: (20 MARKS)**

- a. Water quality parameters can be classified into three main groups. Explain each of the categories and give one example for each case. [6 marks]
- b. The following abbreviations are commonly used when handling the water quality.  
DO, COD and BOD
  - i. What does each abbreviation stand for? [3 marks]
  - ii. Explain how each of the above abbreviations affect the quality of water [6 marks]
  - iii. Explain any five factors that affect the pH of a substance in the environment [5 marks]

**QUESTION FIVE:**

- a) Using examples, discuss the four main causes of global warming [12 marks]
- b) Define the term CFC and draw the structure for the two most common CFCs. Give one use for each CFC you mention [8 marks]