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: 20TH 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$_{50}$ and LOD$_{50}$ [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$_2$ in an alkaline solution [2 marks]

QUESTION TWO: (20 MARKS)

a) Explain how the Effective CO$_2$ concentration differs conceptually and numerically from real CO$_2$ 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 courses 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]