

UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

(BSC) IN ENVIRONMENTAL HEALTH

SECOND SEMESTER MAIN EXAMINATION PAPER MAY 2014

TITLE OF PAPER : ENVIRONMENTAL CHEMISTRY II

COURSE CODE : EHS 414

DURATION : TWO HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ONLY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

: BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR

QUESTION ONE

Draw the structure of Naphthalene and elaborate on the following:

- a. Nature and origin of Naphthalene. (5 marks).
- b. Uses of Naphthalene. (5 marks).
- c. Mode of exposure of humans to naphthalene. (5 marks).
- d. Harmful human health impacts of naphthalene. (5 marks).
- e. Medical test to determine exposure to naphthalene. (5 marks).

Total 25 marks

QUESTION TWO

1. Explain the uniqueness of Carbon and how it is capable of producing millions of different chemical compounds. (4 marks)
2. Organic compounds can be divided into seven groups. List these groups. (7 marks).
3. Write down the general molecular formulae for the following:
 - a. Straight- and branched- chain alkanes. (2 marks).
 - b. Cyclic alkanes. (2 marks).
 - c. Alkenes. (2 marks)
 - d. Alkynes. (2 marks).
4. Alkanes undergo two types of chemical reactions. Name these reactions and write an example of a balanced chemical equation for each. (6 marks).

Total 25 marks

QUESTION THREE

1. List the major constituents of fly ash. (5 marks).
2. What is asbestos? (2 marks).
3. What are the primary constituents of asbestos? (4 marks).
4. List the six types of asbestos. (6 marks).
5. List four properties of asbestos. (4 marks).
6. List four uses of asbestos. (4 marks).

Total 25 marks

QUESTION FOUR

1. Why is atmospheric mercury of concern? (3 marks).
2. At what state is elemental mercury at room temperature? What is the name given to it? (2 marks).
3. How do humans get exposed to mercury vapors and how do these vapors interact within the human body and what are the resulting health implications? (10 marks).
4. Describe the human health effects of methyl mercury. (10 marks).

Total 25 marks

QUESTION FIVE

1. Draw the structural formulae for the following compounds:
 - a. 4-ethyl,2,2-dimethylheptane. (2 marks).
 - b. 2-methylpropane. (2 marks).
 - c. Cis-2-butene. (2 marks).
 - d. Trans-2-butene. (2 marks).
 - e. 1,1,2,2,-tetrachloroethane. (2 marks).
2. Describe how the detergents in dish washers work. (7 marks).
3. Polyvinyl chloride (PVC) is one of the plastics of environmental concern. Describe the environmental and health impacts of PVC. (8 marks)

Total 25 marks