

UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES

B.Sc. IN ENVIRONMENTAL HEALTH SCIENCE

SECOND SEMESTER MAIN EXAMINATION PAPER
MAY 2015

TITLE OF PAPER : ENVIRONMENTAL CHEMISTRY

COURSE CODE : EHM 104

DURATION : TWO HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ANY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

: BEGIN EACH QUESTION ON A NEW PAGE

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

QUESTION ONE

1. The atmosphere absorbs cosmic rays and part of the electromagnetic radiation from the sun. Explain how this helps in nurturing life on earth and what health implications would have happened without this important property of the atmosphere. [10]
2. Describe the formation of greenhouse effect and what would happen on earth had the greenhouse effect not been there. [15]

Total 25 marks

QUESTION TWO

1. Draw an outline of a water body and label the different strata. [3]
2. Using the density temperature relations in the water body, explain how stratification in water bodies comes about. [4]
3. How does this stratification help in the circulation of dissolved substances such as nutrients and oxygen between the bottom and the upper layers of the water body? [8]
4. Describe the oxidation-reduction (REDOX) reactions that take place in the different strata and explain what role these reactions play in determining the properties of dissolved chemical species in the water body. [10]

Total 25 marks

QUESTION THREE

1. Define the term "soil". [4]
2. What is the study of soil called and what does it actually emphasize on? [4]
3. Soil develops as a result of interplay of five factors. What are these factors? [5]
4. Describe soil texture and explain its importance in the chemistry of soil. [12]

Total 25 marks

QUESTION FOUR

1. Draw the structure of benzene and write its chemical formula. [2]
2. In the table below, write the necessary information [16]

Type of hydrocarbon	General molecular formula	Example	Is it saturated or unsaturated	Structural formula
Alkanes				
Alkenes				
Alkynes				
Cycloalkanes				

3. What is isomerism in hydrocarbons? Draw the structures of the isomers of butane. [7]

Total 25 marks

QUESTION FIVE

1. Name six (6) health impacts of Polychlorinated biphenyl. [6]
2. Draw the structures of a Para-xylene, Ortho-xylene and Meta-xylene. [6]
3. Name three chemical processes taking place in a lake and write their chemical equations. [6]
4. With the aid of chemical equations, describe the formation of acid rain due to the combustion of coal. [7]

Total 25 marks

END OF EXAMINATION