

UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

(BSC) IN ENVIRONMENTAL HEALTH

FIRST SEMESTER FINAL EXAMINATION PAPER DECEMBER 2013

TITLE OF PAPER : ENVIRONMENTAL CHEMISTRY I

COURSE CODE : EHS 413

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

- a. In a tabular form, list the first three different spheres of the atmosphere and describe each sphere highlighting the changes temperatures, chemical species, air movement, density, altitude, and pressure as one moves from one sphere to the next from the Earth’s surface. (24 marks).

	1 st sphere	2 nd Sphere	3 rd Sphere
Name of sphere			
Temperature			
Chemical species			
Air movement			
Density			
Altitude			
Pressure			
Lapse rate			

- b. Write the figure of the moist adiabatic lapse rate. (1 mark).

TOTAL 25 MARKS

QUESTION TWO

With the aid of balanced chemical equations, describe the aquatic chemistry of a lake. (25 marks).

TOTAL 25 MARKS

QUESTION THREE

- a. Describe soil including its constituents (10 marks).
b. Explain the process of soil formation detailing the weathering processes that are involved. (15 marks).

TOTAL 25 MARKS

QUESTION FOUR

With the aid of balanced chemical equations, discuss the **formation** and **control** of acid precipitation by the use of fossil fuels that contain a high proportion of sulfur.

TOTAL 25 MARKS

QUESTION FIVE

- a. Differentiate between global warming and the greenhouse effect. (4 marks)
- b. In the table below list the chemical substances that are responsible for the formation of acid precipitation, global warming, and ozone depletion. (You may expand the table as much as your answer may dictate. (12 marks).

Acid precipitation	Global warming	Ozone depletion

- c. Draw and label a structure of a soil profile and highlight the materials found in each horizon. (9 marks)

TOTAL 25 MARKS