



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

DEGREE IN ENVIRONMENTAL HEALTH SCIENCE, AND
SUPPLEMENTARY EXAMINATION PAPER 2016

TITLE OF PAPER : ENVIRONMENTAL CHEMISTRY
COURSE CODE : EHM 104
DURATION : 2 HOURS
MARKS : 100

INSTRUCTIONS : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
: ANSWER **ANY FOUR** QUESTIONS
: EACH QUESTION **CARRIES 25** MARKS.
: WRITE NEATLY & CLEARLY
: NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.
: 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. Describe the role played by Oxidation-Reduction reactions in the chemistry of dissolved species in water. (13 marks).
- b. Briefly describe the importance of the first two layers (from the earth surface) of the atmosphere in supporting life on earth. (12 marks).

TOTAL 25 MARKS

QUESTION TWO

- a. Why is there concern regarding the use and misuse of chemistry as far as the environment is concerned? (14 marks).
- b. Water has a higher surface tension than any other liquid. Explain how this surface tension comes about and how it influences water chemistry. (11 marks).

TOTAL 25 MARKS

QUESTION THREE

- a. Describe how biological, chemical and physical weathering contributes to the formation of soil. (12 marks).
- b. With the help of a chemical equation, show how pyrite oxidation contributes to soil acidity. (6 marks).
- c. Briefly explain how nitrification and denitrification processes are brought about in soil chemistry. Include chemical equations where necessary. (7 marks).

TOTAL 25 MARKS

QUESTION FOUR

- a. Water supports all forms of life. It would be a grave mistake to temper with its chemistry. Support this argument. (8 marks).
- b. Discuss the role of Oxidation-Reduction reactions in the chemistry of dissolved chemical species in water. (8 marks).
- c. Briefly explain how climatic and topographic factors may affect the intensity and dispersion of air pollution in a city. (9 marks).

TOTAL 25 MARKS

QUESTION FIVE

- a. List *five* physical and *three* chemical properties of soil. (8 marks).
- b. There are several ways that can contribute to soil degradation. Briefly describe how chemical degradation can contribute to the degradation of soils. (12 marks).
- c. How can these problems of chemical degradation of soil be corrected? (5 marks).

TOTAL 25 MARKS