



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR
THIRD YEAR FIRST SEMESTER**

**SCHOOL OF SCIENCE & INFORMATION SCIENCE
BACHELOR OF SCIENCE (CHEMISTRY) AND
BACHELOR OF EDUCATION (SCIENCE)**

COURSE CODE: CHE 310

COURSE TITLE: CHEMISTRY OF S AND P BLOCK ELEMENTS

DATE: 20/04/2018

TIME: 0830 - 1030HRS

INSTRUCTIONS

1. The paper consists of four questions
2. QUESTION ONE is compulsory and carries 30 marks
3. Attempt any other two (2) questions, each carries 20 marks

QUESTION ONE – 30 MARKS (COMPULSORY)

- a) While giving relevant chemical equations for reactions, discuss the formation and properties of group 2A oxides [10 Marks]
- b) Aluminium is the most abundant metallic element in the earth's crust, occurring in a variety of aluminosilicates. Briefly describe the process of obtaining aluminium from bauxite [6 marks]
- c) (i) Explain the meaning of term "inert pair effect" [1 mark]
(ii) What cause the "inert pair effect" [2 marks]
- d) Briefly highlight the trends in the chemistry of p-block elements with respect to acidic and basic nature of the oxides [2 marks]
- e) Nitrogen occurs as an inert diatomic gas in the atmosphere.
- i) Discuss four chemical properties/reactions of nitrogen and give the chemical equations for the reactions [8 marks]
- ii) List two uses of nitrogen [1 marks]

QUESTION TWO – 20 MARKS

Beryllium and aluminium are placed diagonally opposite each other in the periodic table. Discuss the similarities in chemical properties of beryllium and aluminium. Give equations for the chemical reactions where applicable [20 Marks]

QUESTION THREE – 20 MARKS

- a) Discuss three methods applied in the separation of boron [6 Marks]
- b) Explain the transitions that occur when boric acid is heated stepwise from room temperature to temperatures above 150 °C [6 Marks]
- c) Using diborane, illustrate four reactions of boranes and give relevant chemical equations for the reactions [8 Marks]

QUESTION FOUR - 20 MARKS

- a) Highlight four similarities in the chemistry of boron and silicon [4 Marks]
- b) Give four uses of silicon dioxide [2 Marks]
- c) Organometallic compounds display major differences from organic compounds. What causes the differences between the chemistry of organic compounds and organometallic compounds? [4 Marks]
- d) While giving relevant chemical equations, discuss the methods employed in the preparation of hydrogen [10 Marks]

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