

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE AND BACHELOR OF EDUCATION (SCIENCE)**

**CHEM 212: COMPARATIVE STUDY OF S AND P BLOCK ELEMENTS**

**STREAMS: BSC & BED (SCI)**

**TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 11/4/2018**

**8.30 A.M. – 10.30 A.M.**

**INSTRUCTIONS:**

- **DO NOT WRITE ANYTHING ON THE QUESTION PAPER**
- **ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- Estimate the effective nuclear charge of one of the outermost electron of fluorine, calcium and nickel (Atomic numbers of F, Ca & Ni are 9, 20 and 28 respectively). [5 marks]
- How is lithium similar to magnesium. [4 marks]
- Briefly discuss the most commonly used method of extraction of sodium metal. [6 marks]
- Boron is different from other group III A element. Discuss [5 marks]
- With a specific example in each case, give five uses of phosphate. [5 marks]
- Helium has special properties that are different from other elements. Discuss. [5 marks]

**QUESTION TWO (20 MARKS)**

- Explain trends of atomic and ionic size of the elements in the Periodic Table. [12 marks]
- Briefly discuss the three classes of hydrides. [8 marks]

**QUESTION THREE (20 MARKS)**

- With an example of chemical reaction in each case, discuss chemical properties of group II A elements. [10 marks]
- Briefly describe how each of the group IV A element is extracted and give two uses of each. [10 marks]

**QUESTION FOUR (20 MARKS)**

With suitable chemical equations (where necessary), briefly discuss the following:

- (a) Three methods of preparation of diborane [5 marks]
  - (b) Extraction and uses of fluorine [5 marks]
  - (c) Properties and main use of hydroxylamine [5 marks]
  - (d) Sulphuroxyacids and their structure [5 marks]
-