



# **MAASAI MARA UNIVERSITY**

**SUPPLEMENTARY UNIVERSITY  
EXAMINATIONS  
2021/2022 ACADEMIC YEAR  
SECOND YEAR FIRST SEMESTER  
SCHOOL OF PURE APPLIED AND HEALTH  
SCIENCES  
BACHELOR OF SCIENCE IN CHEMISTRY**

**COURSE CODE: CHE 2111-1**

**COURSE TITLE: CHEMISTRY OF s AND p-  
BLOCK ELEMENTS**

**DATE: 31<sup>ST</sup> MARCH, 2022**

**TIME: 1430-1630**

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**INSTRUCTIONS TO CANDIDATES**

1. Answer Question **ONE** and any other **TWO** questions.
2. All Examination Rules Apply.

### QUESTION ONE

- a) Explain with relevant chemical equations (where applicable) reasons for the following observations
- i) The electropositivity of group III elements increases from Boron to Aluminium then decreases from Aluminium to Thallium **(2mks)**
  - ii) State the factors that affect the ionization energy **(5mks)**
  - iii) With a chemical equation state the products formed when alkali metals react with ammonia **(3mks)**
- b) Briefly discuss ammonia and phosphine **(6mks)**
- c) With examples what is meant by the term allotropy **(2mks)**
- d) State any two impure forms of carbon and describe how they are produced **(4mks)**
- e) Give four factors necessary for complex ion formation **(4mks)**
- f) Group two elements form predominantly ionic compounds but Beryllium forms covalent compounds. Explain **(2mks)**
- h) Illustrate by chemical equations the amphoteric nature of aluminum oxide **(4mks)**

### QUESTION TWO

- a) Give three similarities between the following;
- i) Lithium and Magnesium **(3mks)**
  - ii) Beryllium and aluminium **(3mks)**
- b) Discuss the two major oxides of carbon using equations where applicable **(6mks)**
- c) Describe the types of interhalogen compounds **(8mks)**

### QUESTION THREE

- a) Distinguish the two allotropes of phosphorus based on the colour, ignition in air and toxicity **(3mks)**
- b) State the oxidation state of Nitrogen in Nitric oxide, nitrogen dioxide and nitrogen trioxide respectively **(3mks)**
- c) Distinguish between the two allotropes of Sulphur **(4mks)**
- d) Describe the origin of amorphous and plastic Sulphur **(2mks)**
- e) Explain the different types of oxides **(8mks)**

### QUESTION FOUR

- a) Water is a non-conductor yet some non-conductors can conduct electricity when dissolved in it. Explain **(3mks)**
- b) Write balanced chemical equations to show the solubility of sulphur dioxide in water and its reaction with sodium hydroxide **(4mks)**
- c) Using equations, show that hydrogen sulfide is acidic and that its a reducing agent **(4mks)**
- d) State the two oxides of phosphorus and explain the more stable one **(4mks)**
- e) Water has a relatively high boiling point. Explain **(2mks)**
- f) Briefly discuss nitrogen trichloride **(3mks)**

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