



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

*Faculty of Applied & Health Sciences*

DEPARTMENT OF PURE AND APPLIED SCIENCES

**DIPLOMA IN SCIENCE INDUSTRIAL MICROBIOLOGY & BIOTECHNOLOGY  
(DIMBT 11M)**

ACH 2204: INORGANIC CHEMISTRY

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 2011**

**TIME: 3 HOURS**

## **Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*

This paper consists of **TWO** sections **A & B**

Answer **ALL** questions in section A and **THREE** questions in section B.

Each question in section **A** carries **4** marks while those in section **B** carry **15** marks each

This paper consist of **THREE** printed pages

## SECTION A (Answer all questions)

### Question One

- a) Distinguish between electro valency and covalency (4 marks)
- b) State **FOUR** properties of metals (4 marks)
- c) List any **TWO** uses of;
- (i) Carbon dioxide (2 marks)
  - (ii) Silicon dioxide (2 marks)
- d) Differentiate between the following terms
- (i) Electronegativity and Electropositivity (2 marks)
  - (ii) 1<sup>st</sup> and 2<sup>nd</sup> Ionization energy (2 marks)
- e) State;
- (i) Two similarities between Boron and Silicon despite being in different groups (2 marks)
  - (ii) Two differences between Aluminium and Boron inspite of being same group (2 marks)
- f) List any **FOUR** properties of covalent compounds (4 marks)
- g) Define the following terms
- (i) Ligands
  - (ii) Metallic radius
  - (iii) Covalent radius (6 marks)

## SECTION B

### Question Two

Describe the periodic trend of:

- a) Electronegativity
- b) Ionization energy
- c) Melting point
- d) Atomic radius (12 marks)
  - (i) Across the period (1 ½ marks)
  - (ii) Have lower melting points than group 2A elements (1½ marks)

### Question Three

- a) Write chemical formulae of the following complex ions
- (i) Tetra cyanonickelate (II) ion
  - (ii) Hexa aqua cobalt (III) ion
  - (iii) Hexamine Nickel (III)
  - (iv) Hexa aqua copper (II) ion
  - (v) Hexa cyano ferrate (III) ion (10 marks)

b) State **THREE** factors that influence ionization energy (3 marks)

c) State **FOUR** physical properties of alkali earth metals (2 marks)

**Question Four**

a) State **FIVE** characteristics of transition metals (5 marks)

b) Using dots and cross illustrate formation of HCl, and Cl<sub>2</sub> molecules (4 marks)

c) Define the following terms

(i) Electronegativity

(ii) Ionization energy

(2 marks)

d) State **FOUR** uses of complex compounds in industries (4 marks)

**Question Five (15 marks)**

Elements A and B have atomic numbers 19 and 6 respectively.

a) Write down the electronic configuration of; A and B elements and identify the element (4 marks)

b) State giving reasons the element with the larger first ionization energy (3 marks)

c) State the period and group of elements A and B (4 marks)

d) Identify giving reason which element forms (4 marks)

(i) Ionic compounds

(ii) Covalent compounds