



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.

Tel: +254 (0)799529958, +254 (0)799529959, +254 (0)712524293

Website: www.must.ac.ke Email: info@must.ac.ke

University Examinations 2022/2023

SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

SCS 3111: PHYSICAL INORGANIC CHEMISTRY

DATE: AUGUST 2023

TIME: 2 HOURS

INSTRUCTIONS: *answer question one and any other two questions*

QUESTION ONE (30 MARKS)

- a) Name the subatomic particles found in an atom and state their charges (3 marks)
- b) With reference to sodium atom difference between atomic number and mass number (4 marks)
- c) What are isotopes, give an example (2 marks)
- d) What is a chemical bond? (1 mark)
- e) Draw the Lewis structure of ammonia molecule (3 marks)
- f) State 3 importance of hydrogen bonding (3 marks)
- g) Define acid and base as per Bronsted and Lowry (3 marks)
- h) Explain the meaning of the term conjugate acid base pairs? Give an example (3 marks)
- i) Define the terms (3 marks)
 - (i) pH
 - (ii) POH
 - (iii) PKa
- j) What is a buffer solution give an example? (2 marks)
- k) Define the following terms (3 marks)

- i) Radioactivity
- ii) Covalent bonding
- iii) Ion

QUESTION TWO (20 MARKS)

Discuss hydrogen bonding (20 marks)

QUESTION THREE (20 MARKS)

Discuss practical applications of radioactivity (20 marks)

QUESTION FOUR (20 MARKS)

Discuss the trends down a group and across period for the following (20 marks)

- a) Ionic radius
- b) Ionization energy
- c) Atomic size
- d) Electronegativity