KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

SPECIAL EXAMINATION

SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF BACHELOR OF EDUCATION SCIENCE
SECOND SEMESTER 2021/2022
(JULY, 2022)

CHEM 229: BASIC ELECTROCHEMISTRY

STREAM: Y2 S2 **TIME: 2 HOURS**

DAY: WEDNESDAY, 3.00 PM – 5.00 PM **DATE: 27/07/2022**

INSTRUCTIONS:

1. ***Do not write anything on this question paper.***
2. ***Answer ALL Questions in section A and any TWO Questions in Section B.***

SECTION A

1. Define the terms:
   a) Bond enthalpy (4marks)
   b) Bond Enthalpy Values (4marks)
   c) The enthalpy change of a reaction (4marks)
   d) $\Delta H < 0$ (4marks)
   e) $\Delta H > 0$ (4marks)
2. Using suitable diagrams distinguish between exothermic and endothermic reactions. (10marks)
3. (a) Explain "bond dissociation energy" (3marks)

   (b) Differentiate bond energy from atomization energy (3marks)

   (c) Distinguish between ΔS^o and ΔH^o (4marks)

4. (a) Explain the terms as used in electrochemistry:

   (i) Thermodynamic Stability (2marks)

(ii) Chemical Stability (2marks)

(iii) Activation energy (2marks)

(b) State the name described by" the thermodynamic tendency toward randomness or disorder" Give an example. (4marks)

SECTION B

5(a). using an example explain exergonic reaction and endergonic reaction as used in electrochemistry. (6marks)

(b) State the components of the electrolytic cell. (4marks)

(c)Distinguish between an electrochemical cell and an Electrolytic cell (5marks)

(d) Explain the term stability (5marks)

6(a) Explain the differences between the Primary cell and the secondary cell

(5marks)

(b) Explain what a fuel cell is as used in electrochemistry (3marks)

(c) What is a cell potential (4marks)

(d) State the factors that influence cell potential (3marks)

(e) With examples outline the applications of electrolysis (5marks)

7(a) Distinguish chemical kinetics and thermodynamics (5marks)

(b) Outline the factors that affect chemical kinetics (5marks)

(c)What will be the speed of the chemical reaction? (5marks)

(i) Constant despite the changes in temperature (5marks)

(ii) Changes inversely with the absolute temperature (5marks)

(iii) Extremely rapid between gases as the average kinetic energy of the molecules is great. (5marks)

(iv)Extremely rapid between ions in aqueous solution as no bonds are needed to be broken. (5marks)