UNIVERSITY EXAMINATION

CHUKA  **UNIVERSITY**

RESIT/SPECIAL EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE

CHEM 325: ELECTROCHEMISTRY

STREAMS: **TIME: 2 HOURS**

DAY/DATE: THURSDAY 06/05/2021 **2.30 P.M – 4.30 P.M**

INSTRUCTIONS:

Answer any Question ALL Questions.

QUESTION ONE (30 MARKS)

1a) (i). Explain how you can increase the value of reduction potential (2 marks)

(ii) Why do electrochemical cells stops working after some time (2 marks)

(iii) Why is hydrogen electrode not generally used in pH measurement (3 marks)

(iv) The e.m.f of the cell;

TI/TI $Cl_{(s)}$ / KCl (0.1M)/$Hg_2Cl_{2\,(s)}$/Hg is 0.73 volts and $dE/dT = 7.5 \times 10^{-4}$

(I) Write the individual electrode reaction and the overall cell reaction (3 marks)

(II) Calculate enthalpy change (ΔH), change in Gibb's free energy (ΔG) and entropy change (ΔS) (1F=96500C) (7 marks)

(b) Describe the construction and working of the calomel electrode (3 marks)

QUESTION TWO (20 MARKS)

2a. Briefly discuss the factors that influence transport numbers (13 marks)

(b) A solution of $AgNO_3$ was electrolyzed with silver electrodes. Before electrolysis 25g of the solution contained 26.50mg of silver while after electrolysis 25g of the anode solution contained 42.94 mg of silver. During the time of electrolysis 32.10mg of silver was deposited in a silver voltameter. Calculate the transport numbers (7 marks)

QUESTION THREE (20 MARKS)

3a Explain what you understand by temperature compensation (reference temperature conversion) or a test solution in conductivity measurement (6 marks)

B Discuss the effect of dilution on the equivalent and molar conductance (3 marks)

C State kohlrausch law (1 mark)
