

Eastern University, Sri Lanka

Third Year First Semester Examination in Science-2008/2009

(May/August 2012)

External Degree

EXTCH 303 Electrochemistry

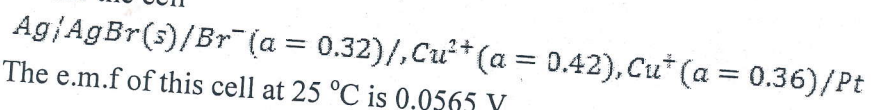
Answer all questions

Time: 01 hour

- 1) (a) (i) Write the Debye-Huckel equation and state what are the assumptions made for derive the equation. (10 marks)
- (ii) Calculate mean activity coefficient of  $\text{Al}_2(\text{SO}_4)_3$  in the solution contains 0.04 M  $\text{Al}_2(\text{SO}_4)_3$  and 0.03 M NaBr. (30 marks)
- (b) (i) State Kohlrausch's law. (10 marks)
- (ii) The limiting molar conductivities of KCl,  $\text{KNO}_3$  and  $\text{AgNO}_3$  are 149.9, 145.0 and 133.4  $\text{S cm}^2 \text{mol}^{-1}$  respectively at  $25^\circ \text{C}$ . What is the limiting molar conductivity of AgCl at this temperature? (25 marks)
- (c) Discuss the electrophoretic effect to explain the increase in conductance of strong electrolytes on dilution. (25 marks)

Contd...

2) (a) Consider the cell

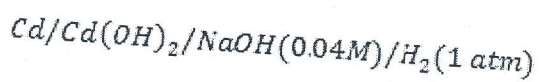


The e.m.f of this cell at 25 °C is 0.0565 V

- i) Write the cell reactions
- ii) Calculate  $E_{\text{cell}}^\ominus$  and  $\Delta G^\ominus$

(50 marks)

(b) The following cell is given



The  $E_{\text{cell}}^\ominus$  and  $E_{\text{cell}}$  of the cell at 50° C are 0.45 V and 0.05 V respectively.

Calculate the solubility product of  $\text{Cd}(\text{OH})_2$  at 50 °C.

(50 marks)

-----