DEPARTMENT OF APPLIED SCIENCES
"T3,Examination MAY 2018"

Semester: IV   **Date of Exam**:15/05/2018
Subject:PHYSICAL CHEMISTRY-III   **Subject Code**:CHH217-T
Branch: CHEMISTRY   **Session**: II
Course Type: CORE   **Course Nature:**
Time: 3 Hours   **Program: B.Sc**
Max.Marks: 80   **Signature: HOD/Associate HOD**

NOTE : PART A:All questions are compulsory.questions will be of short answer type(20 marks)
PART B&C:Attemp any two questions out of three.(30 marks each section)

Part-A
Q1(a)What do you understand by the Transport no.of an ion?   (2)
(b)What is effect of dilution on Specific conductance and why?   (2)
(c)Write down Debye-huckel Onsagar equation.   (2)
(d)For strong electrolytes what is the value of Degree of Dissociation?   (2)
(e)while determining Transport No. by Hittorf's method which electrodes are used when electrodes are attackable?   (2)
(f)Explain the term Equivalent Conductivity and its unit also?   (2)
(g)what is the value of Ionic Product of water?   (2)
(h)what do you mean by Wien's effect?   (2)
(i)Differentiate between Electrode Reduction potential and EMF?   (2)
(J)Calculate equivalent conductivity from the following data: (2)
  (i)0.1 N solution has a resistance of $2.5*10^2$ohms
  (ii)cell constant =1.15 cm-^{1}

PART-B
Q2(a).Define Solubility and Solubility product.Give its two applications.   (4)
(b)Discuss (i)Relaxation effect   (2.5)
        (ii)electrophoretic effect   (2.5)
        (iii)Common ion effect   (2)

(c)Define ionic mobility ionic Conductance and how they are related?   (4)

Q3.(a)A conductance cell on being filled with a 0.02 molar solution of KCl at 25^oC showed a resistance of 165 ohm ohms.the specific conductance of the KCl solution used is $2.77*10^{-3}$mhos cm^{-1}.The same cell containing 0.01 molar NaCl solution gave an electrical resistance of 384 ohms.calculate the specific and equivalent conductance of the NaCl. Solution.   (5)

(b)write Postulates Of Arrhenius theory of Ionisation.   (6)
(c)discuss Boundary Method for the determination of Transport no.   (4)

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Q4 (a).The specific Conductance of saturated solution of Silver chloride at 18°C is $1.24*10^{-6}$ mhos after subtracting that of water.The Mobilities of Ag^+ and Cl^- ions ath this temperature are 53.8 and 65.3 respectively.calculate the solubility of silver chloride in grams per litre. (4)

(b)state and explain Kohlrausch law. (4)

(c)Discuss the curves obtained in conductometric titrations of(i)Strong acid and weak base
(ii)weak acid and weak base (5)

(d)Explain the function of salt bridgeas ,why KCl is Used as salt bridge? (2)

PART-C

Q5(a).what are concentration cells?give examples (6)

(b)Describe determination of activity coefficient from EMF measurement. (5)

(C)What is meant by hydrogen Electrode?what are the advantages and disadvantages of of this (4)
electrode?

Q6.(a)what do you understand by Liquid-Junction Potential?How does it arise?Derive its equation also.(5)

(b)Write cell reaction and calculate E^0 for the cell:

$Zn|Zn^{2+}(1M)||Fe^{2+}(1M),Fe^{3+}(1M);Pt$ given: (5)
$E^0(Fe^{3+},Fe^{2+})$=0.77 V,$E^0(Zn^{2+},Zn)$=0.76V

(c)What is a reversible cell?how do you measure its EMF? (5)

Q7.(a) Discuss the applications of EMF measurement in Potentiometric titrations. (8)
(b)Describe the important applications of EMF measurement. (7)

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