MAO-003-001608

Seat No. _____

B. Sc. (Sem. VI) (CBCS) Examination

March / April - 2018

C-603 : Chemistry

(Physical Chemistry & Analytical Chemistry)

(New Course)

Faculty Code : 003

Subject Code : 001608

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) This question paper contains **three** questions.

(2) All are **compulsory**.

(3) Figures to the right indicate full marks.

1 Answer the following : **20**

(1) Give the unit of entropy.

(2) What is Chemical potential ?

(3) Give equation for ionic strength.

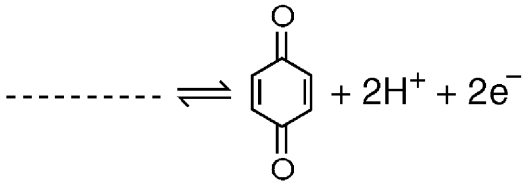
(4) As G.N. Lewis concept : the activity has been indicated for ideal gas by _____. (Fill the blank)

(5) Give full form of LJP.

(6) Give full form of emf.

(7) Sparingly soluble salt has less solubility in water (true/false)

(8) Complete the reaction



(9) Define specific conductance.

(10) What is unit of specific resistance of conductor ?

(11) For the reduction of polarization _____ current is used.

(12) Define mobile phase.

(13) For paper chromatography stationary phase is solid. (true/false)

(14) Give structure of p-divinyl benzene.

(15) Define Rf value.

(16) How many H^+ can be ionised from calcon ?

(17) Define ligand.

(18) Which salt of EDTA is used to prepare standard EDTA solution ?

(19) Give name of any one electrometric titration.

(20) What is pH of pure distilled water ?

2 (a) Answer any **three** out of six : **6**

(1) Define partial molar properties.

(2) Describe Henry's law with its equation.

(3) Define activity and activity co-efficient.

(4) Give the equations of mean activity and mean activity co-efficient.

(5) Define liquid junction potential.

(6) Write equation of emf for concentration cell by using salt bridge.

(b) Answer any **three** out of six. **9**

(1) Derive the mathematical form of third law of thermodynamics.

(2) Discuss residual entropy.

(3) Write short note for concept of chemical potential.

(4) Explain Debye-Huckel limiting law with empirical correction.

(5) Explain relation of activity and activity co-efficient.

(6) Derive the equation of emf for amalgam concentration cell.

(c) Answer any **two** out of five : **10**

(1) Discuss the determination of absolute entropies of solid, liquid and gas with related equations.

(2) Describe the method of intercept for partial molar properties.

(3) Describe method to determine activity co-efficient by solubility method.

(4) Explain determination of dissociation constant of weak acid by emf measurement.

(5) Find the emf of given cell at 25°C and calculate free energy change (ΔG) : [R = 8.314 JK^{-1} mol^{-1}]

$$Cu \Big/ \underset{0.1\ M}{Cu^{+2}} \Big/ \underset{0.5\ M}{Cu^{+2}} \Big/ Cu$$

3 (a) Answer any **three** out of six. **6**

(1) Give the factors affecting conductance.

(2) Define chromatogram and stationary phase.

(3) Give the structure of EDTA and EBT.

(4) Write Velcher's law.

(5) Explain principle of potentiometry method.

(6) Explain about pH value at end point from type of salt by potentiometry.

(b) Answer any **three** out of six. **9**

(1) Discuss Kohlrausch law.

(2) Explain titration of $Ba(OH)_2$ by $MgSO_4$.

(3) Explain column chromatography.

(4) Write short note for muroxide indicator.

(5) Explain $P^M \rightarrow$ volume of EDTA curve.

(6) Discuss acid-base titration by potentiometry.

(c) Answer any **two** out of five. **10**

(1) Describe the method to determine the degree of hydrolysis and hydrolysis constant by conductometry.

(2) Explain in detail GLC technique.

(3) (i) Advantage of TLC

(ii) Uses of ion exchange chromatography.

(4) Explain various methods of EDTA titration.

(5) Discuss the Argentometric titration by potentiometry.
