Physical Chemistry

Q-1(A) Answer the following Questions [1 mark]

(1) Which types of energy take place in **'Concentration cell'**

(2) Define transport number?

(3) Give the name of electrolyte used in salt bridge.

(4) What is Full form of LJP ?

(5) Explain chemical formula of mercurous ion.

(6) What is Quinhydrone electrodes.

(7) Name any two electrode used which can use to calculate P^H of solution?

(8) Give the name of secondary standard electode.

(9) Write Nernst equation

(10) What is EMF ?

(11) Who introduce partial molar properties?

(12) Give any two example of intensive properties.

(13) Give any two example of extensive properties.

(14) What is Chemical potential?

(15) Define (i) Open system (ii) Closed system

(16) Write Gibbs-Duhem equation for binary system.

(17) Define Raoult law

(18) Define Henry law

(19) Write chemical formula of Nernst distribution method.

(20) Which factor effect on chemical potential ?

(B) Answer the following Questions [2 mark]

(1) Explain the reason of LJP.

(2) Write the cell reaction of the cell of $Zn\text{-}Hg(C_1)|ZnSO_4(aq)| Zn\text{-}Hg(C_2)$;

(3) Classify types of concentration cell.

(4) Prove that the valency of mercurous ion +2

(5) Define partial molar properties with examples.

(6) Derive the equation of chemical potential effect of temperature.

(7) Characteristics of chemical potential or partial molar Gibbs free energy.

(8) Characteristics of partial molar properties.

(C) Answer the following Questions [3 mark]

(1) How to determine P^H using Quinhydrone electrode with the help of emf measurement.

(2) Describe emf method for determination of solubility of sparingly soluble salt.

(3) Explain glass electrode used for determining P^H of solution.

(4) State Raoult law and derive the equation, $P^0\text{-}P/P^0 = X_2$

(5) State Henry law and derive the equation, $P = K_H X$

(6) Determination partial molar properties by method of intercept.

(D) Answer the following Questions [5 mark]

(1) Explain concentration cell with transference and derive equation

$$E_{w.t} = t_\_ \ (RT/F) \ ln(a_2/a_1)$$

(2) Describe the determination of dissociation constant of weak acid by E.M.F. method

(3) Explain the concept of chemical potential and derive Gibbs-Duhem equation

(4) Explain the variation of chemical potential with temperature and pressure.

Q-2(A) Answer the following Questions [1 mark]

(1) Define accuracy.

(2) Define errors.

(3) Give the name of types of errors.

(4) Write significant figure of (i) 20.3 (ii) 0.0021

(5) Define standard deviation.

(6) What is meant by Rf and Rx value?

(7) Write the name of preparation of plate in TLC.

(8) Which adsorbent used in column chromatography?

(9) Give the name detector used in GC.

(10) Give the name of LLC(liquid- liquid chromatography.

(11) write the name of active group on cation exchanger.

(B) Answer the following Questions [2 mark]

(1) Define confidence intervael and confidence limit.

(2) Give the classification of errors.

(3) Differentiaite error and mistake.

(4) Explain selection of carrier gas in GC.

(5) Give the properties of resin used in ion exchange chromatography.

(6) Explain advantages of TLC over other chromatography.

(C) Answer the following Questions [3 mark]

(1) Round off each of the following to two and three significant figures:

(i) 17.99, (ii)0.04145 and (iii) 10.235

(2) Explain instrumental and methodic error.

(3) State laws to determine significant figure any two.

(4) Give the definition of (i) stationary phase (ii) mobile phase and (iii) eluent.

(5) Explain circular paper chromatography.

(6) Explain in detail GLC.

(D) Answer the following Questions [5 mark]

(1) Explain Gaussian curve with diagram.

(2) The normality of solution is determined by four separate titrations. The result obtained are 0.2041, 0.2049, 0.2039, 0.2043 Calculate the mean, average deviation, relative average deviation, standard deviation and coefficient of variance.

(3) Describe principle, types, working method and application of ion exchange chromatography.

(4) Describe principle, working method and application of column chromatography.