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PH-003-001608 Seat No. _____

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

July - 2018

C - 603 : Chemistry

(Physical & Analytical Chemistry) (New Course)

Faculty Code : 003

Subject Code : 001608

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

Instructions : (1) Total three questions.
(2) All questions are compulsory.
(3) Question - 1 carries 20 marks.
(4) Question - 2 and 3 carry 25 marks each.

1 Answer the following questions : **20**

(1) Write Nernst's statement of third law of thermodynamics.
(2) Write Gibbs-Helmhotz equation.
(3) Give statement only, for Nernst Heat Theorem.
(4) State Henry's law.
(5) Write formula of Raoult's law.
(6) What is extensive property ?
(7) Select the name of scientist from the bracket, who had given the concept of partial molar property....
(A. J. Rozi, D. R. Bhadja, K. M. Raj, G. Ñ. Lewis)
(8) What is activity ?
(9) In equation $f = \frac{a}{c}$, f is _____.
(10) Write oxidation reaction for quinhydrone electrode.
(11) Define : Conductance and Resistance.
(12) Draw a graph for conductometric titration of weak acid strong base.
(13) The name "Chromatography" was given by the scientist _____.
(14) Define : Mobile phase and Stationary phase.
(15) Write full forms of GLC and TLC.
(16) What is the formula of "R_f value" ?
(17) Write structure of EDTA.
(18) PPM means _____.
(19) Define "pH". Who had given pH scale ?
(20) Find the pH of solution, which is having $pOH = 7.5$.

2 (a) Answer any **three** of the following : **6**

(1) Write the final statement of thermodynamics third law, according to Nernst.

(2) Write any one test of third law of thermodynamics.

(3) Define Partial Molar Property; give its formula.

(4) State Raoult's law with equation.

(5) Write equations of mean activity and mean activity coefficient.

(6) Define : Liquid junction potential.

(b) Answer any **three** of the following : **9**

(1) Explain Residual Entropy.

(2) Describe Nernst Heat theorem.

(3) Write short note : Effect of temperature on chemical potential.

(4) Show the relation of activity and activity coefficient.

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

(6) Calculate ionic strength for 0.1 M NaCl and 0.01 M $BaCl_2$ solution. (Ionization completed)

(c) Answer any **two** of the following : **10**

(1) Derive Gibbs – Duhem equation.

(2) Discuss Debye – Huckel limiting law with empirical correction including graph.

(3) Classify the concentration cells with examples.

(4) Describe the determination of dissociation constants of weak acid by emf measurement.

(5) Explain determination of ionic product of water by emf measurement.

3 (a) Answer any **three** of the following : **6**

(1) Define : Equivalent conductance and Molar conductance.

(2) Explain the effect of dilution on different conductance.

(3) Write uses of GLC.

(4) Describe the principle of Ion exchange chromatography.

(5) Explain Welcher's rule for EDTA titrations.

(6) Give principle of Potentiometry method.

(b) Answer any **three** of the following : **9**

(1) Discuss the shape of precipitation titration curve of NaCl by $AgNO_3$.

(2) Give the effect of temperature on conductance measurement.

(3) Describe TLC plate preparation.

(4) Write uses of ion exchanges chromatography.

(5) Write a short note on calomel electrode.

(6) Explain : $Fe \rightarrow K_2Cr_2O_7$ redox titration by potentiometry.

(c) Answer any **two** of the following : **10**

(1) Describe the method to determine degree of dissociation and dissociation constant of weak acid by conductance measurement.

(2) Describe in details : Paper chromatography technique.

(3) Write a short note on "Masking and demasking method."

(4) Discuss acid-base titration by potentiometry.

(5) Explain in detail : The TLC for separation.