

Assignment
CHE-309
Sem VI 2018
Unit Test I & II

Unit-I

***Questions for Long Answers:**

- (1) Derive molal elevation constant.
- (2) Write a note on "law of mass action from chemical potential."
- (3) Explain: Third law of Thermodynamics & Calculate the Absolute entropy of a substance with the Help of 3rd Law.
- (4) Add 1.439 gm CH₃COOH in 12.3 gm benzene at 273.9⁰ k. Freezing point of Benzene is 278.7⁰k. Molal depression constant is 4.90.M.W of CH₃COOH is 60 gm/mole. Decide the Molecular state of acetic acid in Benzene.

***Questions for Short Answers:**

- (a) What is the symbol of Entropy?
- (b) Definition of 2nd law of Thermodynamics.
- (c) What is colligative Properties?
- (d) Draw the graph of molal elevation constant or molal depression constant.
- (e) If we are given two temperatures and two pressures, which equation will be used to find out the heat of vaporization.
- (f) Define:-chemical potential.

Unit-II

***Questions for Long Answers:**

- (1) Derive an equation of emf of gas Concentration cell in which Hydrogen gas at two different pressure.
- (2) Derive an equation for emf of Concentration cell with transference and without L.J.P.
- (3) Derive an equation of emf of Concentration cell with transference.
- (4) Derive an equation of emf of Concentration cell without transference.
- (5) Derive Tafel's equation.
- (6) Define Over voltage and discuss Hydrogen over voltage. OR Write a note on Over Voltage.

***Questions for Short Answers:**

Define following terms

- (i) Concentration cell.
- (ii) Electrode concentration cell.
- (iii) Electrolytic concentration cell.
- (iv) Amalgam electrode.
- (v) Liquid junction potential.
- (vi) Over voltage.
- (vii) Decomposition Over voltage.
- (viii) Why KCl and NH₄NO₃ are used to construction of salt bridge.

Unit-III

[A] Phase Rule:

***Questions for Long Answers:**

- (1) Describe Zn-Cd system.
- (2) Describe Pb-Ag system.

- (3) Write a short note on
 (A) Zeotropic freezing mixtures (B) Azeotropic freezing mixtures
- (4) Write a short note on
 (A) Zeotropic liquid mixtures OR ideal liquid mixtures
 (B) Azeotropic liquid mixtures OR non-ideal liquid mixtures
- (5) Write a short note on
 (A) Steam Distillation (B) Zone refining OR Fractional Distillation

[B] Osmosis:

*Questions for Long Answers:

- (a) Describe reverse osmosis method for the Desalination of salt water.
 (b) Describe Electro dialysis method to make pure water from impure water containing salts.
 (c) How to recover Silver, copper and iron from waste liquids? Describe it.

Unit-IV

[A] Photochemistry

*Questions for Long Answers:

- (1) Explain photochemical reaction.
 (2) Discuss about Grotthus-Draper law and Stark-Einstein law of photochemistry.
 (3) Explain high and low quantum efficiency.
 (4) Explain phosphorescence and fluorescence.
 (5) Discuss photosensitizer and chemiluminescence.

*Questions for Short Answers:

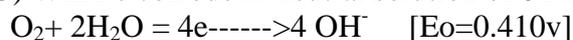
- (a) Give the definition of photochemical reaction.
 (b) Give the statement of Stark-Einstein law.

[B] Metallic Corrosion

*Questions for Long Answers:

- (1) Discuss Differential aeration principle & give its practical proof.
 (2) Explain: Corrosion in atmosphere.
 (3) Explain: Prevention of corrosion in short.
 (4) A current of 2 Amp flowing for 12 min through a cell composed of two platinum electrodes in an industrial waste solution containing copper nitrate & nitric acid deposits 0.40 gm of copper at the cathode & 87 ml of O₂ evolved at STP at the anode. Calculate the current efficiency for Cu- deposition & O₂ evolution.

(5) Will Fe corrode in neutral solution of 8 PH at 25°C. $E_0 \text{ Fe/Fe}^{+2} = 0.44\text{v}$



*Questions for Short Answers:

- (a) What is corrosion? (b) State different types of corrosion.
 (c) Give definition:-
 (i) uniform corrosion (ii) localized corrosion (iii) pitting corrosion
 (iv) selecting corrosion (v) Galvanic corrosion (vi) Intergranular corrosion
 (vii) corrosion fatigue
 (d) State three metals which have +ve SRP value.
 (e) Give the reaction that occurs on anode & cathode during corrosion.
 (f) Give the main elements that constitute oil paint.
 (g) What is polarization?
 (h) What is desalination?