Q. P. Code: 33294

Duration: 3 hours **Marks: 70**

Q1.a. Calculate the pH of 2
i. 0.1 M HCl ii. 0.001 M NaOH (pKw = 14)

b. Discuss factors affecting solubility of gases in liquids. 3

c. What is half-life of a reaction? Derive equation for half-life of first order reaction. 3

d. What are surfactants? Explain the HLB classification system. 3

e. Write a note on concentration cells. 2

f. Enlist the properties of lyophobic colloids. 2

Q2.a. What are buffers? Write a note on buffers in pharmaceutical system. 4

OR

Discuss methods to adjust tonicity of a solution.

b. What is phase rule? Discuss phenol-water system in detail. 4

c. Derive an equation for reaction rate constant of a first order reaction. 3

Q3.a. Explain partition coefficient and give its applications. 4

b. Define energy of activation. State and explain Arrhenius equation and its applications. 4

OR

Define order of reaction. Explain any two methods to determine order of reaction.

c. What are adsorption isotherms? State Langmuir and Freundlich adsorption isotherm equations. 3

Q4.a. What are acidic buffers? Derive Henderson-Hasselbach equation for acidic buffers. 4

b. Classify different types of electrodes and explain glass electrode. 3

c. Explain methods of preparation of lyophobic colloids. 4

OR

Write a note on zeta potential and electrophoresis.

Q5.a. Write a note on collision theory. 3

b. What is wetting and contact angle? Explain the role of wetting agents. 4

c. Explain the protective action of lyophilic colloids 4

OR

Explain 'Schultz Hardy rule' and 'gold number'.

Q6.a. The half life for a first order reaction is 30minutes. What will be the concentration of the reactant remaining after 90 minutes. 3

b. What is interfacial tension? Explain any one method to determine surface tension. 4

c. State Nernst equation and explain ion sensitive electrode. 4