[Time: - 3 Hours] **[Marks : 70]**

Please check whether you have got the right question paper

N.B. (1) All questions are compulsory
(2) Figures to the right indicate full marks
(3) Draw neat labelled diagrams wherever necessary

1.a.	Determine the pH of i. 0.01 M HCl ii. 0.002 M NaOH (pKw = 14)	**2**
b.	Comment on solubility of gases in liquids.	**3**
c.	Define with examples molecularity and order of reaction.	**3**
d.	What is spreading coefficient? Give its applications.	**3**
e.	Write a note on concentration cells	**2**
f.	Enlist the properties of lyophobic colloids.	**2**
2.a.	Classify methods to adjust tonicity and explain any one in detail.	**4**
	OR	
	What are buffers? Write a note on pharmaceutical buffers.	
b.	What is critical solution temperature? Explain phenol-water conjugate system.	**4**
c.	Derive an equation for reaction rate constant of a first order reaction.	**3**
3.a.	Explain partition coefficient and give its applications.	**4**
b.	Discuss effect of temperature on rate of reaction.	**4**
	OR	
	Enlistmethods to determine order of reaction and explain any 2 in detail.	
c.	What are adsorption isotherms? State and explain equation for Langmuir adsorption isotherm and Freundlich adsorption isotherm	**3**
4.a.	Derive Henderson-Hasselbach equation for acidic buffers.	**4**
b.	Explain different types of electrodes.	**3**
c.	Explain optical properties of colloids.	**4**
	OR	
	Explain electrical properties of colloids.	
5.a.	What are accelerated stability studies? Give their applications.	**3**
b.	Write a note on wetting and contact angle.	**4**
c.	Describe protective colloids in detail.	**4**
	OR	
	Explain 'Schultz Hardy rule' and 'gold number'.	
6.a.	50% of a first order reaction is completed in 30 minutes. Calculate the time required to complete 75% of the reaction.	**3**
b.	What is surface tension? Explain any one method to determine surface tension.	**4**
c.	State and explain Nernst equation. Write a note on ion sensitive electrode.	**4**

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