Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) EXAMINATION – SUMMER 2016

Subject Code:2133506 **Date:02/06/2016**

Subject Name:Physico-chemical Processes

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Which salt out of the following will be hydrolyzed to give basic solution? NaCN, NaCl, $NaNO_3$, NH_4Cl (*a*) NaCN (*b*) NaCl(*c*) $NaNO_3$ (*d*) NH_4Cl	1
	2	The movement of sol particles under an applied electric potential is called(*a*) electrophoresis (*b*) electro-osmosis (*c*) electro filtration (*d*) none of these	1
	3	In cationic hydrolysis, the resulting solution is (*a*) acidic (*b*) basic (*c*) neutral (*d*) sometimes acidic, sometimes basic	1
	4	Define the term catalytical poisoning with example.	1
	5	Define the term EMF	1
	6	A catalyst (*a*) may be in same phase with the reactants or in a different phase (*b*) may accelerate a reaction (*c*) affects a reaction without being consumed in the process (*d*) all of the above	1
	7	The sols in which the dispersed phase exhibits a definite affinity for the medium or the solvent is called (*a*) lyophillic sols (*b*) lyophobic sols (*c*) emulsions (*d*) hydrosols	1
	8	Define the term eutectic point in phase diagram.	1
	9	NH4F, NH4CN and CH_3COONH_4 are the salts of _____ acid and _____ bases. (*a*) strong, strong (*b*) strong, weak (*c*) weak, strong (*d*) weak, weak	1
	10	Define the term catalysis.	1
	11	Explain the term phase. How many phases are present in the following systems? (*a*) Water and Water vapour (*b*) Saturated solution of NaOH.	1
	12	Define the term molality.	1
	13	Define the term order of reaction.	1
	14	In a suspension the diameter of the dispersed particles is of the order (*a*) 10 Å (*b*) 100 Å(*c*) 1000 Å (*d*) 2000 Å	1
Q.2	**(a)**	The pH of a solution of HCl is 2. Find out the amount of acid present in a litre of the solution.	**03**
	(b)	Find the pH of a buffer solution containing 0.20 mole per litre CH_3COONa and 0.15 mole per litre CH_3COOH. Ka for acetic acid is 1.8×10^{-5}	**04**

	(c)	Define the term adsorption and explain adsorption theory of catalysis with suitable example.	**07**
		OR	
	(c)	Explain phase, component and degree of freedom with examples	**07**
Q.3	**(a)**	What is the cell potential half-cell consisting of zinc electrode in 0.01M ZnSO4 solution at 25°C, E° =0.763V.	**03**
	(b)	The pH of a buffer solution containing 0.5 mole/litre of CH_3COOH and0.5 mole/litre CH_3COONa has been found to be 4.76. What will be the pH of this solution after0.1 mole/litre HCl has been added to the buffer? Assume that the volume is unchanged.Ka= 1.75×10^{-5}.	**04**
	(c)	Explain zero order and pseudo order reaction with examples.	**07**
		OR	
Q.3	**(a)**	Explain heterogeneous catalysis with examples.	**03**
	(b)	Give examples of acid base catalysis and explain their mechanism.	**04**
	(c)	Write a note on dialysis and electrodialysis method of purification techniques of colloids.	**07**
Q.4	**(a)**	Explain dispersion method of prepare of sols.	**03**
	(b)	Write a note on stability of colloids.	**04**
	(c)	Define the term buffer solution. Derive Henderson equation to find out pH of buffer solution.	**07**
		OR	
Q.4	**(a)**	Define the term colloids. Give the classification of collides.	**03**
	(b)	Define the term indicators. Explain theory of indicator.	**04**
	(c)	Define the term order of reaction. Derive equation for first order reaction.	**07**
Q.5	**(a)**	Write a note on effect of temperature on reaction rate.	**03**
	(b)	Explain relation between free energy and EMF.	**04**
	(c)	Draw and explain the phase diagram of one component water system.	**07**
		OR	
Q.5	**(a)**	Define the term half-cell reaction and give various examples of it.	**03**
	(b)	Explain nernsp equation in detail.	**04**
	(c)	Explain Patterson's process for desilversiation of lead from argentiferous lead.	**07**

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