GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 2133506   **Date: 5/12/2019**

Subject Name: Physico-chemical Processes

Time: 02:30 PM TO 05:00 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	**(a)**	Write a note on consecutive reaction.	**03**
	(b)	Write a note on Armstrong theory of indicators.	**04**
	(c)	Write a note on electric double layer and zeta potential.	**07**
Q.2	**(a)**	Give example for zero, one and two degree of freedom.	**03**
	(b)	What is the difference between electro chemical and electrolytic cell? Explain galvanic cell in details.	**04**
	(c)	What do you mean pseudo order reaction? Derive equation for zero order reaction.	**07**
		OR	
	(c)	Write a note on buffer solution and derive the equation for both acid and base.	**07**
Q.3	**(a)**	Write a note on application of colloids.	**03**
	(b)	What do you mean by thermochemistry? Derive equation for calculation of half-cell potential.	**04**
	(c)	Write a note on purification techniques of colloids.	**07**
		OR	
Q.3	**(a)**	Explain mechanism of catalysis for acid base in details	**03**
	(b)	What do you mean by redox reaction? Explain Daniel cell in details.	**04**
	(c)	Explain one component water system by neat and clean phase diagram.	**07**
Q.4	**(a)**	Define the term colloids. Give classification of colloids based on disperse phase and disperse medium.	**03**
	(b)	Derive units of zero, first, second and third order reaction.	**04**
	(c)	Write a short note on common ion effect with examples.	**07**
		OR	
Q.4	**(a)**	Draw phase diagram for four phase and one component system	**03**
	(b)	Find the pH of a buffer solution containing 0.10 mole per litre CH_3COONa and 0.12 mole per litre CH_3COOH. Ka for acetic acid is 1.8×10^{-5}.	**04**
	(c)	What do you mean by condensed system? Explain phase rule for condensed system.	**07**

Q.5 **(a)** Explain promoters, inhibitors and catalytical poisoning with examples. **03**

(b) The pH of a buffer solution containing 0.8 mole/litre of acetic acid and 0.7 mole/litre sodium acetate has been found to be 4.80. What will be the pH of this solution after 0.3 mole/litre HCl has been added to the buffer? Assume that the volume is unchanged. A= 1.75×10^{-5}. **04**

(c) Explain intermediate compound formation theory of catalysis with suitable example. **07**

<div align="center">**OR**</div>

Q.5 **(a)** Give the method of preparation of colloids. **03**

(b) Derive relation between free energy and electro motive force. **04**

(c) Explain heterogeneous catalysis with examples. **07**

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