

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (New) EXAMINATION – WINTER 2018

Subject Code: 2133506
Date: 12/12/2018
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 (a) Write a note on stability of colloids.	03
(b) Write a note on effect of temperature on reaction rate.	04
(c) Write a short note on common ion effect with examples.	07
Q.2 (a) Explain acid base catalysis in details	03
(b) What do you mean by Oxidation-Reduction reaction? Explain half-cell reaction with examples.	04
(c) Explain one component water system by neat and clean phase diagram.	07
OR	
(c) Define the term buffer solution. Derive Henderson equation to find out pH of buffer solution.	07
Q.3 (a) Define the term colloids. Give the classification of collides.	03
(b) Derive Nernst equation showing effect of electrolyte concentration on the potential of an oxidation-reduction electrode.	04
(c) Write a note on purification techniques of colloids.	07
OR	
Q.3 (a) Define the term degree of freedom and explain it in details by taking suitable examples.	03
(b) Define the term electrochemical cell. Explain Daniel cell in details.	04
(c) Define the term chemical kinetics. Derive equation for second order reaction.	07
Q.4 (a) Write a note on parallel reaction.	03
(b) Write a note on quinonoid theory of indicators.	04
(c) Write a note on application of colloids.	07
OR	
Q.4 (a) Explain promoters, inhibitors and catalytical poisoning with examples.	03
(b) The pH of a buffer solution containing 0.6 mole/litre of CH_3COOH and 0.5 mole/litre CH_3COONa has been found to be 4.80. What will be the pH of this solution after 0.1 mole/litre HCl has been added to the buffer? Assume that the volume is unchanged. $A = 1.75 \times 10^{-5}$.	04
(c) Explain adsorption theory of catalysis with suitable example.	07
Q.5 (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 . K_a for acetic acid is 1.8×10^{-5} .	04
(c) Explain phase rule for two component system.	07

OR

- Q.5** (a) Explain the rate law, rate equation and order of reaction with suitable examples. **03**
- (b) Derive relation between free energy and electro motive force. **04**
- (c) Explain heterogeneous catalysis with examples. **07**

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