

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III • EXAMINATION – WINTER • 2014

Subject Code: 2133506**Date: 30/12/2014****Subject Name: Physico-Chemical Processes****Time: 2:30 p.m. to 5:00 p.m.****Total Marks: 70****Instructions:**

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

- Q.1** (a) Draw graph of water system and explain it in detail. **07**
(b) Explain first order reaction with example. **07**
- Q.2** (a) Define the term buffer solution. Derive Henderson's equation to calculate pH of a buffer solution. Find the pH of a buffer solution containing 0.20 mole/lit Sodium acetate and 1.8×10^{-5} . **07**
(b) Give an account of enzyme catalysis. **07**
- OR**
- (b) Write a short note on common ion effect with examples. **07**
- Q.3** (a) Explain the rate law, rate equation and order of reaction with suitable examples. **07**
(b) Define the term electrochemical cell. Explain galvanic cell in details. **07**
- OR**
- Q.3** (a) Derive Nernst equation and calculate the potential of half cell consisting of zinc electrode in 0.01M ZnSO_4 solution at 25°C , $E^0=0.763\text{V}$ **07**
(b) Explain quinonoid theory of indicators. **07**
- Q.4** (a) Define the term catalysis. Explain types of catalysis with examples. **07**
(b) Discuss salient features of lead-silver system. **07**
- OR**
- Q.4** (a) Define the term phase rule and explain terms used in it with examples. **07**
(b) Give in details any two methods of purification of colloids or sols. **07**
- Q.5** (a) Derive mathematical expression for the rate constant of a reaction $\text{A} + \text{B} \longrightarrow \text{P}$. **07**
(b) Write a note on application of colloids. **07**
- OR**
- Q.5** (a) What do you mean by electromotive force? Derive the relation between free energy and EMF. **07**
(b) What are colloids? Give the classification of colloids with examples. **07**
