

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 711702N**Date: 17-06-2014****Subject Name: Environmental Chemistry****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Define following: **07**
 1. Molecules 2. Atom 3. Valance 4. Ionization.
 5. Ist law of thermodynamics 6. Vapour pressure 7. Volatile acid.
- (b) Distinguish between order of reaction and molecularity with examples. **07**
 Derive second order reaction equation for different concentrations.
- Q.2** (a) Calculate (i) Solubility product constant from given values of water solubility **07**
 for (a) $\text{Mg}_3(\text{PO}_4)_2$, 6.1×10^{-5} mol/L (b) FeS , 6.3×10^{-9} mol/L
 (c) $\text{Zn}_3(\text{PO}_4)_2$, 1.6×10^{-7} mol/L (d) CuF_2 , 7.4×10^{-3} mol/L .
 (ii) Balance the following equation :
 $\text{KI} + \text{K}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{SO}_4 \rightarrow \text{Cr}_2(\text{SO}_4)_3 + \text{I}_2 + \text{H}_2\text{O} + \text{K}_2\text{SO}_4$
- (b) What is osmosis? Explain process of osmosis and development of osmotic pressure in detail. **07**
- OR**
- (b) Discuss rate of reaction. Explain simple dialysis cell for recovery of sodium hydroxide from industrial waste. **07**
- Q.3** (a) Explain consecutive reaction with suitable example. Where this reaction is used in environment related issues? **07**
- (b) Explain acid-base and ion-exchange reaction of soil. **07**
- OR**
- Q.3** (a) Explain in brief any suitable method to determine the presence of Nitrates and Nitrites in ground or surface water. **07**
- (b) Discuss in brief different sources and composition of agricultural pollution and its remedies. **07**
- Q.4** (a) Discuss about entry of waste and pollutants in soil and soil degradation. **07**
- (b) What is Michaelis-Menten constant? Derive enzyme kinetics reactions related all equations and mention effect of temperature on it. **07**
- OR**
- Q.4** (a) Discuss determination of Alkalinity and Hardness of water sample. **07**
- (b) What is the environmental significance of Dissolve oxygen and BOD? **07**
- Q.5** (a) Give examples of types of pesticides. What are their biological properties and rate the contamination carried out by it? **07**
- (b) Explain in brief principle of: **07**
 (1) Gas chromatography (2) Colorimetric (3) Polarography
- OR**
- Q.5** (a) Explain any two organic compounds with sources and properties of it. **07**
- (b) Discuss analytical method to determine Colour and Turbidity of water sample. **07**
