

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.E. Sem-IV Remedial Examination Nov/ Dec. 2010****Subject code: 141302****Subject Name: Environmental Sciences-II****Date: 03 / 12 / 2010****Time: 03.00 pm – 05.30 pm****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) Explain the diverse ion effect with example. **07**  
(b) Calculate the concentration in **07**  
(a) moles/L (b) mg/L (iii) number of ions/L, for the chloride ion in a saturated solution of silver chloride to which silver nitrate is added until  $[Ag^+] = 0.0001M$
- Q.2** (a) Explain the following terms in detail **07**  
(ii) Tyndall effect (ii) Brownian movement.  
(b) The molar concentration the major ions in a brackish ground water supply are as **07**  
follows:  $Na^+$  0.02,  $Mg^{+}$  0.015,  $Ca^{+2}$  0.01,  $K^+$  0.001,  $Cl^-$  0.025,  $HCO_3^{3-}$  0.001,  $NO_3^{3-}$  0.02 and  $SO_4^{2-}$  0.012, What would be the approximate osmotic pressure difference across a semi permeable membrane that had brackish water on one side & mineral free water on the other, assuming the temperature is  $25^0C$ .
- OR**
- (b) Write short note on Adsorption. **07**
- Q.3** (a) Explain principles of Solvent Extraction. **07**  
(b) Explain class –I binary mixtures with example. **07**
- OR**
- Q.3** (a) Write the sources of hardness in water. **07**  
(b) Assuming that the effect of dissolved salts on ion activity is negligible & that **07**  
the temperature of the water sample is  $25^0C$  Estimate the bi-carbonate ion concentration (in mg/L as  $CaCO_3$ ) if the pH of the sample is 10.3 & the carbonate concentration 120 mg/L (in mg/L as  $CO_3^{2-}$ ).
- Q.4** (a) Explain environmental significance of solids. **07**  
(b) Explain the chemistry involved in Argentometric method for determination of **07**  
chloride with pH consideration.
- OR**
- Q.4** (a) Define with suitable examples: **07**  
Primary alcohol (ii) Secondary alcohol (iii) tertiary alcohol  
(b) Write short note biological properties of pesticides. **07**
- Q.5** (a) Calculate COD value for wastewater which contains 300 mg/L of (i) leucine (ii) **07**  
butenol (iii) phenol.  
(b) Write the purpose of addition of seed and dilution water in BOD bottle. **07**
- OR**
- Q.5** (a) A water supply was found to have bicarbonate ion concentration of 50 mg/L & **07**  
 $CO_2$  content 30 mg/L .Estimate the approximate pH of the water.  
(b) Write the chemical equation summarizing all the essential reaction involved in **07**  
the Rideal-Stewart modified winkler method for DO?