Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-III Examination-Jan.-2013

Subject code: 131301

Subject Name: Environmental Science-I

Date: 07/01/2013 **Time: 10.30 pm -1.00 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)** Write a short note on application of pH data in environmental engineering field and determine the pH of following solutions. **07**

0.01 N HCl

0.01 N H_2SO_4

(b) Describe henry's and Dalton's law with their importance in environmental engineering field. **07**

Q.2 **(a)** Estimate the bicarbonate ion concentration (in mg/L as HCO_3^- if the pH of the sample is 10 and carbonate concentration is 160 mg/L (as CO_3^{2-}). **07**

(b) What do you mean by hardness. Write the procedure for the measurement of calcium and magnesium hardness. **07**

OR

(b) Explain the generalized gas law and graham's law. **07**

Q.3 **(a)** Explain Mohr's method for determination of chloride. Why must the sample pH be neither high nor low in the Mohr Method for chlorides. **07**

(b) Give the difference between **07**

(i) Primary Standards and Secondary Standards

(ii) Normal Solution and Molar Solution

OR

Q.3 **(a)** Define the solubility product. The solubility product Ksp for Calcium Sulphate in water at 25^0 C is 1.96×10^{-4} . Determine the equilibrium Ca^{+2} concentrations for a saturated calcium sulfate solution in mg/l if ideal behavior is assumed. **07**

(b) Differentiate chemical and microbiological analysis. **07**

Q.4 **(a)** Define pH. Write the short note on pH meter. **07**

(b) Explain the principle on which conductivity meter works. **07**

OR

Q.4 **(a)** What do you mean by distilled water & demineralized water? Write the method for preparation of demineralized water. **07**

(b) Calculate volume of oxygen required at $25^{o}C$ and 0.5 atm. Pressure for combustion of 40 gm of methane. **07**

Q.5 **(a)** Write short note on application of standard methods for water and wastewater analysis. **07**

(b) Write the procedure for analysis of alum. **07**

OR

Q.5 **(a)** Explain ionization of Weak Acids. **07**

(b) How is stock solution of N/1 sulfuric acid is prepared? Give calculations for preparation of N/50 solution from it. **07**

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