

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 H₂SO₄

(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 HCO₃⁻ if the pH of the sample is 10 and carbonate concentration is 160 mg/L (as CO₃²⁻). **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 K_{sp} for Calcium Sulphate in water at 25^o 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°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**
