

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (New) EXAMINATION – WINTER 2015

Subject Code:2131301**Date:18/12/2015****Subject Name: Environmental Sciences - I****Time: 2:30pm to 5:00pm****Total Marks: 70****Instructions:**

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

		MARKS
Q.1	Short Questions	14
1	Number of gram equivalent of solute dissolved in one liter of solution is called its (a) Normality (b) Molarity (c) Molality (d) Formality	1
2	Which of the following an ideal solution (a) Boyle's Law (c) Raoult's Law (b) Amagat's Law (d) Henry's Law	1
3	pH value of an alkaline solution is (a) 7 (c) <7 (b) >7 (d) Constant over a wide range	1
4	Molality is define as number of gm moles of solute per _____ of solvent. (a) Litre (c) gm mole (b) kg (d) gm	1
5	Atomic _____ of an element is whole number. (a) Weight (c) Volume (b) Number (d) Radius	1
6	NTU means_____. (a) Nephelometric Transform Unit (b) Nephelometric Turbidity Unit (c) Nephelogrametic Transform Unit (d) Nephelometriy Transform Unit	1
7	Molal Solution Consist of 1 formula weight dissolved in _____ of water. (a) 1 kg (c) 1 gm (b) 500ml (d) 10 ml	1
8	Gravimetric analysis means analysis by _____. (a) Weight (c) Density (b) Mass (d) Volume	1
9	Any Solution that has been standardize against a primary standard is called as_____. (a) Preliminary (c) Tertiary (b) Secondary (d) None of these	1

- 10 The alkalinity of water is measure of its capacity to _____ acids. 1
 (a) Strong (c) Neutralize
 (b) weak (d) None of these
- 11 When alkalinity \geq Total hardness 1
 (a) Carbonate hardness in (mg/l) \geq Total hardness in (mg/l)
 (b) Carbonate hardness in (mg/l) \leq Total hardness in (mg/l)
 (c) Carbonate hardness in (mg/l) = Total hardness in (mg/l)
 (d) None of these.
- 12 Beer's law is concerned with _____ in relation to solution concentration. 1
 (a) Light absorption (c) Light transmission
 (b) Light optical (d) None of these
- 13 Grab samples are those taken more or less _____ and _____ separately. 1
 (a) Instantaneously, analyzed (c) Varily, Quantify
 (b) Spontaneously, Measured (d) Slowly, analyzed
- 14 Optical method of analysis measure result of interaction between _____ and matter. 1
 (a) Internal Energy (c) Kinetic Energy
 (b) Potential Energy (d) Radiant Energy
- Q.2** (a) What precaution must be taken with the use of a volumetric pipet? 03
 (b) Find the P^H of following solutions: (i) 0.05M HCl (ii) 0.08N HCl 04
 (c) Explain generalized gas law and Graham's law 07
- OR**
- (c) Explain Henry's Law in detail. 07
- Q.3** (a) Discuss the nature of material causing turbidity in 03
 (a) River water during a flash flood
 (b) Domestic waste water
 (b) Calculate the amount of powder required in grams /solution required in ml for preparation of following solutions: 04
 (i) 1000ml 0.0282N AgNO₃ (ii) 1000 ml 0.25 N K₂Cr₂O₇
 (c) Write the importance of calibration of glass wares and instruments. 07
- OR**
- Q.3** (a) Explain the significance of drying and ignition temperature of 103°C and 600°C respectively, in analysis of environmental sample 03
 (b) Write the uses of following instruments and capacity of measurement; (i) COD Apparatus (ii) Hot Air Oven 04
 (c) What do you mean by Distilled water & Demineralized water? Write the method for preparation of demineralized water. 07
- Q.4** (a) What is hardness in water and by what is it caused? 03
 (b) Write the uses and capacity of following glass wares: (i) Desiccators (ii) Volumetric flask 04
 (c) Explain ionization of Weak Acids 07
- OR**
- Q.4** (a) What type of electrode is used for PH measurement, and how is it calibrated? 03
 (b) Explain in brief (i) Molar Solution (ii) Normal solution 04

- (c) Write a short note on Spectrophotometer with figure 07
- Q.5** (a) Define atomic weight and equivalent weight 03
- (b) Give the differences between Primary standards & Secondary standards 04
- (c) Write short note on conductivity meter. 07
- OR**
- Q.5** (a) Write the measurement of procedure of Ca and Mg hardness 03
- (b) Write the uses of instruments 04
- (i) High volume Air Sampler
- (ii) BOD Incubator
- (c) Write Sort note on “ Standard Methods for water and waste water analysis” 07
