

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (New) EXAMINATION – WINTER 2018****Subject Code: 2131301****Date: 28/11/2018****Subject Name: Environmental Sciences I****Time: 10:30 AM TO 01:00 PM****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 (a) Differentiate between Distilled water and De-mineralized water.	03
(b) Define the terms: Valency, Accuracy, Drying & Desiccation.	04
(c) Mention the uses of following instruments/glassware: i) Hot Air Oven ii) Desiccators iii) Separating funnel iv) Laminar Air Flow v) Autoclave vi) conical flask vii) burette	07
Q.2 (a) Define Molarity, Molality and Normality.	03
(b) Generalized gas law based on which laws? Explain them.	04
(c) Explain the procedure of preparation of High purity water with neat sketch.	07
OR	
(c) Enlist the characteristic of Primary standard and Secondary standard chemicals. Give examples of them.	07
Q.3 (a) Explain procedure to standardize the secondary standard with one example.	03
(b) Explain the procedure to prepare following solution and mention whether it is primary or secondary standard. (a) 250 ml, 0.02M Na ₂ CO ₃ (b) 1000 ml, 0.1M HCl	04
(c) Explain Mohr's method for determination of Chlorides.	07
OR	
Q.3 (a) Explain the principle of Atomic Emission spectroscopy. Mention instruments based on Atomic Emission spectroscopy and draw a neat sketch of any one.	03
(b) Differentiate between Volumetric and Gravimetric analysis.	04
(c) State Henry's law, Dalton's law and Graham's law. Highlight the application of any two of above laws in Environmental Engineering field.	07
Q.4 (a) Find out the pH of a mixture formed by mixing the following two solutions. Solution 1: Volume 300mL, pH = 7 Solution 2: Volume 600mL, pH = 5	03
(b) Explain the need of Standard Methods for analysis of water and wastewater parameters?	04
(c) Explain the principal of potentiometric analysis. Enlist the electrode used in same and draw figure of any one type of electrode.	07

OR

- Q.4** (a) Enlist the instruments based on dispersion and scattering of light. Explain the principle of any one with neat sketch. **03**
- (b) Explain the principle of Infrared spectroscopy and UV-Visible spectroscopy. **04**
- (c) Explain the procedure to determine the total hardness and calcium hardness along with the calculation of expression of result. **07**
- Q.5** (a) Explain procedure of determination of alkalinity. **03**
- (b) Give classification of solids and explain any three types of solids. **04**
- (c) Give classification of sampling techniques and explain each of them with their importance. **07**

OR

- Q.5** (a) Highlight the significance of pH in water and its impact on life of living beings. **03**
- (b) Highlight the significance of sulfate in water and wastewater. **04**
- (c) Calculate total hardness, total alkalinity, and carbonate hardness values for a wastewater having pH 7. Concentration of anions and cations are as follows: **07**
- Calcium Ions: 60 mg/L, Magnesium: 20 mg/L ions, Sodium: 14.8 mg/L, Bicarbonate ions: 150 mg/L, Sulfate ions: 30 mg/L, and Carbonate ions : 110 mg/L

www.FirstRanker.com