Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2151302   **Date: 03/06/2019**
Subject Name: Advanced Environmental Instrumentation
Time: 02:30 PM TO 05:00 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)**	Draw the figure of pH electrode and explain its working principle	**03**
	(b)	Define the following Terms: (1)True value (2) Electromagnetic spectrum	**04**
	(c)	State the importance of Advanced Environmental Instrumentation subject in the field of Environmental Engineering.	**07**
Q.2	**(a)**	Give the classification of spectroscopy methods and its application in various fields.	**03**
	(b)	Define the types of determinate errors with at least one example of each.	**04**
	(c)	Explain the principles, instrumentation & applications of AAS.	**07**

OR

	(c)	Write down the application, advantages and disadvantages of Ion Selective Electrode.	**07**
Q.3	**(a)**	Give the difference between Raman Spectroscopy and Infrared Spectroscopy.	**03**
	(b)	Define terms NTU and FTU. Differentiate the terms Turbidimetry and Nephalometry with proper diagrams.	**04**
	(c)	Explain the Column chromatography with neat sketch.	**07**

OR

Q.3	**(a)**	Draw a figure of electromagnetic spectrum indicating different spectral regions with wavelengths and frequencies	**03**
	(b)	Derive and explain Lambert's and Beer's law.	**04**
	(c)	Write a short note on IR spectroscopy with principle, instrumentation and applications in environmental analysis.	**07**
Q.4	**(a)**	What is call potentiometry? List advantages of this method in environmental analysis.	**03**

(b) Discuss the application of TOC analyzer in environmental engineering field. **04**

(c) Write a short note on TOC analyzer. **07**

OR

Q.4 **(a)** What do you mean by Online sensors? **03**

(b) Write Applications of DO Sensors. **04**

(c) Write down the application, advantages and disadvantages of Ion Selective Electrode. **07**

Q.5 **(a)** Differentiate between Accuracy and precision with example **03**

(b) Explain the term Relative Deviation with examples **04**

(c) Analyst reported the following percentage (%) of Feo in a sample: 17.65, 17.70, 17.68, 17.60, 17.58, 17.63 and 17.64. Calculate mean, medium, range, average deviation, relative deviation, standard deviation and co-efficient of variation. **07**

OR

Q.5 **(a)** Differentiate between Determinate and Indeterminate Error with example **03**

(b) Define the term Mean and Median. **04**

(c) Write a short note on Frequency distribution curve. **07**

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