Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2022

Subject Code:3151302 Date:11-01-2023

Subject Name:Advance Environmental Instrumentation

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Discuss the classification of spectrum in detail.	**03**
	(b)	Give significance of 'Advanced Environmental Instrumentation' in environmental engineering field.	**04**
	(c)	Write a short note on pH meter and its applications in Environmental Engineering field.	**07**
Q.2	**(a)**	a. Define the term (i) Wave number and (ii) Refractive Index b. Calculate the energy of the photon of wavelength 600 nm.	**03**
	(b)	Derive and explain Lambert's and Beer's law.	**04**
	(c)	Differentiate between Visual and Instrumental method of turbidity measurement.	**07**
		OR	
	(c)	Identify the types of conductivity meter electrode. Explain each type with its application.	**07**
Q.3	**(a)**	Explain the fundamentals principles of Spectroscopy.	**03**
	(b)	Differentiate between UV – Visible Spectrophotometer and Atomic Absorption Spectrophotometer.	**04**
	(c)	Enlist the types of Detectors used in Spectroscopy. Explain Flame Ionization Detector in detail.	**07**
		OR	
Q.3	**(a)**	State the applications of TOC analyzer in environmental engineering field	**03**
	(b)	Give the difference between adsorption and partition chromatography.	**04**
	(c)	Explain in detail sensor method for determination of dissolved oxygen.	**07**
Q.4	**(a)**	Write applications of Potentiometry.	**03**
	(b)	Explain determinate and indeterminate error with example.	**04**
	(c)	Explain the working principle of Infrared spectroscopy with neat sketch.	**07**
		OR	
Q.4	**(a)**	Write down the applications of Ion selective electrode.	**03**
	(b)	Explain the working principle of conductivity meter with neat sketch.	**04**
	(c)	Explain the online DO meter with neat sketch.	**07**
Q.5	**(a)**	Explain the terms "Accuracy and Precision.	**03**
	(b)	How total Organic carbon is measured in TOC analyzer?	**04**
	(c)	Write a short note on importance of statistical analysis of laboratory data.	**07**
		OR	
Q.5	**(a)**	Explain the principle of Ion Chromatography.	**03**

(b) Explain the merits and demerits of the gas chromatograph. **04**

(c) Write a short note on High Performance Liquid chromatograph. Also draw a neat sketch. **07**

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