GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2023

Subject Code:3151302   **Date:11-12-2023**
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)**	What is its Importance of Advanced Environmental Instrumentation?	03
	(b)	List the various types of light sources used in for different types of spectrophotometer?	04
	(c)	Enlist applications of various Advanced Environmental Instrumentations	07
Q.2	**(a)**	List the various types of detector used in IR spectrometry?	03
	(b)	State Beer-Lambert's law.	04
	(c)	Differentiate the terms Turbidimetry and Nephalometry with proper diagrams	07

OR

	(c)	Draw a figure of electromagnetic spectrum indicating different spectral regions with wavelengths and frequencies.	07
Q.3	**(a)**	With suitable diagrams, discuss the various sampling techniques in Gas Chromatography.	03
	(b)	With a neat diagram, explain the instrumentation setup of Atomic absorption spectrophotometer	04
	(c)	With necessary diagrams, explain the working principle of HPLC. (High pressure liquid chromatography)	07

OR

Q.3	**(a)**	List the types of detectors used in gas chromatography.	03
	(b)	State the major process involved in AES with neat sketch.	04
	(c)	With a neat sketch, explain the instrumentation set up of Mass spectrometer and its function.	07
Q.4	**(a)**	Define conductivity with their environmental significance.	03
	(b)	Elaborate with neat sketch Standard Hydrogen Electrode.	04
	(c)	Explain in detail sensor method for determination of dissolved oxygen	07

OR

Q.4	**(a)**	Give the significance of DO in environment.	03
	(b)	What is Potentiometry? List advantages of this method in environmental analysis.	04
	(c)	Enlist Ion-selective electrodes and explain any two in detail.	07

Q.5	**(a)**	Define: (i) True Value (ii) Variance (iii) Co-efficient of Variation	**03**
	(b)	Discuss about statistical treatment of random errors	**04**
	(c)	Write a short note on Frequency distribution curve.	**07**

OR

Q.5	**(a)**	Differentiate between: Accuracy and Precision	**03**
	(b)	Explain the term with examples (i) Standard Deviation (ii) Relative Deviation	**04**
	(c)	State and explain types of errors in experimental data.	**07**

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