Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2024

Subject Code: 3151302 Date:21-05-2024

Subject Name: Advance 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Give the modern classification of chromatographic techniques with one example of each.	**03**
	(b)	Give the difference between visible and instrumental method for measurement of turbidity	**04**
	(c)	What is Advanced Environmental Instrumentation? What is its Importance?	**07**
Q.2	**(a)**	Draw the figure of pH electrode and explain its working principle.	**03**
	(b)	Explain the merits of gas chromatography.	**04**
	(c)	Define the following terms in detail: (i) Mean (ii) Medium (iii) Range (iv) Average Deviation (v) Relative average deviation (vi) Standard deviation (vii) Co-efficient of variation.	**07**
		OR	
	(c)	Explain the working principle and operation of each unit of Nephelo turbidity meter with neat sketch.	**07**
Q.3	**(a)**	What wavelength range is characteristics of (i) visible radiation (ii) ultraviolet radiation (iii) infrared radiation	**03**
	(b)	State the applications of High Performance Liquid Chromatography.	**04**
	(c)	Derive and explain Lambert's and Beer's law.	**07**
		OR	
Q.3	**(a)**	Give the significance of DO in environment.	**03**
	(b)	Differentiate between Single beam and Double Beam UV – Visible Spectrophotometer.	**04**
	(c)	Differentiate between UV Visible Spectroscopy & Atomic Absorption Spectroscopy (AAS).	**07**
Q.4	**(a)**	State different instrumental method of analysis useful for analysis of the following compounds: (i)metals (ii) inorganic ions (iii) volatile organic compound (iv) nonvolatile organic compound	**03**
	(b)	Discuss the application of TOC analyzer in environmental engineering field.	**04**
	(c)	Explain the working principle and operation of each unit of High Performance Liquid Chromatography with sketch.	**07**
		OR	
Q.4	**(a)**	What do you mean by Online sensors?	**03**
	(b)	List down components of Flame photometer. Explain each component.	**04**
	(c)	State and explain different types of errors with at least one example of each.	**07**
Q.5	**(a)**	Define: (i)elution (ii) atomization (iii)chromatograph	**03**
	(b)	Enlist the types of Detectors used in Spectroscopy.	**04**
	(c)	Explain the working principle and operation of each unit of Colorimeter with sketch.	**07**

OR

Q.5	**(a)**	Write applications of Potentiometry.	**03**
	(b)	Differentiate between Accuracy and precision.	**04**
	(c)	Write down the application, advantages and disadvantages of Ion Selective Electrode.	**07**

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