

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V EXAMINATION – WINTER 2025****Subject Code:3151302****Date:21-11-2025****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) Draw a figure of electromagnetic spectrum indicating different spectral regions with wavelengths and frequencies.	03
	(b) Enlist the advance environmental instruments with its applications.	04
	(c) Derive and explain Lambert's and Beer's law.	07
Q.2	(a) Define Spectroscopy. Discuss behavior of molecules in various EMR.	03
	(b) Give the Classification of Chromatographic Methods.	04
	(c) Describe the Principle, instrumental arrangement of UV/Visible Spectroscopy in Detail with application.	07
	OR	
	(c) Enlist the types of Detectors used in Spectroscopy. Explain any one in detail.	07
Q.3	(a) Explain the following chromatographic parameters. (i)mobile phase, (ii)elution, (iii)stationary phase	03
	(b) Explain the principle of mass spectroscopy with diagram.	04
	(c) Elaborate types of chromatography, types of detectors used in it and its application.	07
	OR	
Q.3	(a) Discuss the types of column uses in Chromatography.	03
	(b) Draw a neat sketch of Standard Hydrogen Electrode and explain in detail.	04
	(c) Differentiate between UV – Visible Spectrophotometer and Atomic Absorption Spectrophotometer	07
Q.4	(a) Explain the principle of ion –exchange chromatography.	03
	(b) Draw a neat sketch of HPLC and elaborate its instrumentation.	04
	(c) Enlist and explain the different types of Ion Selective Electrode with components with neat sketch and write down application	07
	OR	
Q.4	(a) Enlist applications of TOC analyzer.	03
	(b) Differentiate the terms Turbidimetry and Nephelometry with diagrams.	04
	(c) Explain in detail sensor method for determination of dissolved oxygen	07

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| Q.5 | (a) | Highlight the applications of online sensors. | 03 |
| | (b) | Describe Conductivity Meter with analytical applications. | 04 |
| | (c) | Explain the principle, instrumentation and application of AAS. | 07 |

OR

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| Q.5 | (a) | Define the followings: (I) Standard deviation (II) Co-efficient of Variation (III) True Value | 03 |
| | (b) | Give the applications of AAS and AES. | 04 |
| | (c) | Enlist and explain the types of errors with at least one example of each. | 07 |
