Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2151302 Date:20/11/2018

Subject Name:Advanced 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**

			MARKS
Q.1	**(a)**	Explain the following terms: i. Coefficient of variation ii. Spectroscopy iii. Precision iv. Mean v. Conductivity vi. Chromatography.	**03**
	(b)	Differentiate between Visual and Instrumental method of turbidity measurement.	**04**
	(c)	Differentiate between UV – Visible Spectrophotometer and Atomic Absorption Spectrophotometer.	**07**
Q.2	**(a)**	Draw the figure of pH electrode and explain its working principle	**03**
	(b)	Explain the working principle of conductivity meter with neat sketch.	**04**
	(c)	With the help of neat sketch explain components of Ion Selective electrode.	**07**
		OR	
	(c)	What is polarography? Explain the online DO meter with neat sketch.	**07**
Q.3	**(a)**	Highlight the application of Gas Chromatography	**03**
	(b)	Describe the Double Beam UV – Visible Spectrophotometer with neat sketch.	**04**
	(c)	Explain the principle of Nephelometer. With the help of neat sketch explain its components.	**07**
		OR	
Q.3	**(a)**	Explain the Principle of UV – Visible Spectroscopy with it's applications in Environmental Engineering.	**03**
	(b)	Explain the Lambert and Beer's Law in brief.	**04**
	(c)	Enlist the types of Detectors used in Spectroscopy. Explain Flame Ionization Detector in detail.	**07**
Q.4	**(a)**	Discuss the use of Spectroscopy in Environmental Engineering Field.	**03**
	(b)	State the Principle of IR Spectroscopy with its instrumentation and neat sketch.	**04**
	(c)	Describe the Principle and Instrumentation of Gas Chromatograph with neat sketch	**07**
		OR	
Q.4	**(a)**	What is Chromatography? Give classification of the chromatographic methods.	**03**
	(b)	Write down the application of Ion selective electrode	**04**
	(c)	Explain the components and working of Atomic Absorption Spectrometer in detail.	**07**

Q.5	**(a)**	Explain the oxidation method used in closed loop type of TOC analyzer.	**03**
	(b)	Highlight the application of each type of TOC analyzer	**04**
	(c)	Explain the principle on which TOC analyzer works. Enlist different types of flow through TOC analyzer and draw a sketch. Explain different oxidation methods used in them.	**07**

OR

Q.5	**(a)**	Differentiate between Accuracy and precision with example	**03**
	(b)	Differentiate between Determinate and Indeterminate Error with example	**04**
	(c)	The following are results of absorbance of 30 sample with same absorbance obtained using spectrophotometer: 0.441 , 0.445 , 0.447 , 0.449 , 0.450 , .450 , 0.451 , 0.452, 0.453 , 0.453 ,0.454 , 0.455 , 0.456 , 0.456 , 0.457 , 0.458 , 0.458 , 0.459 ,0.459 , 0.460 , 0 .461 , 0 .461 , 0 .466 , 0 .468 , 0.470 ,0.472 ,0.475, 0.455, 0.458, 0 .461 Draw the frequency distribution polygon for above data.	**07**

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