## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-V • EXAMINATION – WINTER 2013

Subject Code: 151302

Date: 29-11-2013

Subject Name: Advanced Environmental Instrumentation Time: 10.30 am - 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.
- Q.1 (a) Explain in detail Woodward-Fieser rules for the calculation of  $\lambda_{max}$  of 07 dienes.Calculate the  $\lambda_{max}$  of the following molecule



(b) Attempt following questions
1.Derive the Beer -Lambert law (4)
2.Mention the application of HPLC (3)

## Q.2 (a) Attempt following questions1. Differentiate following molecules basis on IR-spectroscopy (4)



2. Explain in brief the importance of "Mutual exclusion rule" for the IR &Raman spectroscopy with two examples. (3)

(b) Draw the schematic diagram of Raman-Spectrometer and describe each part in detail.

## OR

- (b) Explain the electron impact ionization (EI) and chemical ionization(CI)
- Q.3 (a) Mention the classification of chromatography and draw the schematic 07 diagram of GC with label
  - (b) Write the short note on "Affinity in chromatography"

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Q.3	<b>(a)</b>	Explain the principle of Ion Chromatography(IC) in detail	07
	(b)	Explain following terminology use in chromatography 1.Normal phase 2.Reverse phase 3.Retention time 4.Retention volume 5.Relative retention 6.Column efficiency 7.Resolution	07
Q.4	<b>(a)</b>	Define "asymmetric centre." Draw the schematic diagram of Thermo gravimetric (TG) and Polarimeter instruments with label	07
	<b>(b)</b>	Write the application of thermogravimetry	07
		OR	
Q.4	(a)	<ul><li>Attempt following questions</li><li>1. Explain Faraday's first and second law (4)</li><li>2. Give the classification of electro analytical methods (3)</li></ul>	07
	<b>(b)</b>	Write the short note on reference electrodes"	07
Q.5	(a)	Write the short note on "TOC analyzer"	07
	(b)	Write the short note on "Accuracy and Precision	07
		OR	
Q.5	(a)	Draw the schematic diagram of Fluorometry and explain its important application with reference to detection of pollutants	07
	(b)	Attempt following questions 1. Write the formula of: [1].Mean [2].Standard deviation [3]. Confidence limits (3)	07
		2. Write the short note on "Linear Regression"(4)	

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