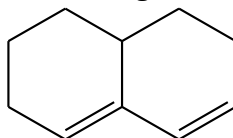


GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER 2013****Subject Code: 151302****Date: 29-11-2013****Subject Name: Advanced Environmental Instrumentation****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

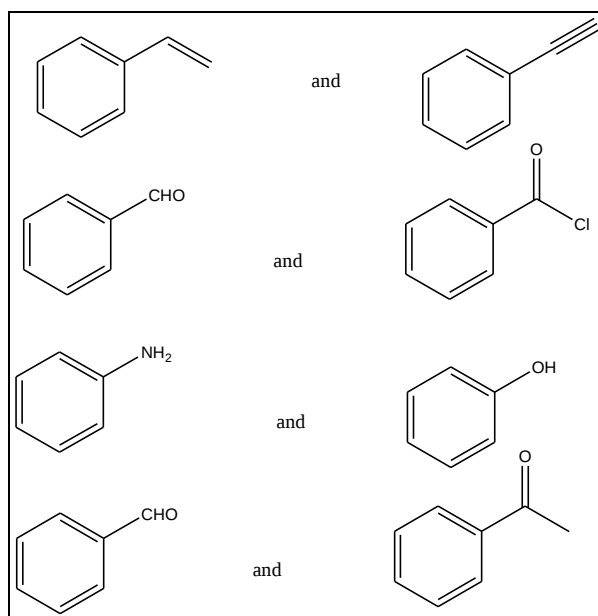
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Explain in detail Woodward-Fieser rules for the calculation of $\lambda_{\max}$ of dienes. Calculate the $\lambda_{\max}$ of the following molecule **07**



- (b)** Attempt following questions **07**
1. Derive the Beer -Lambert law (4)
 2. Mention the application of HPLC (3)

- Q.2 (a)** Attempt following questions **07**
1. 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. **07**

OR

- (b)** Explain the electron impact ionization (EI) and chemical ionization (CI) **07**

- Q.3 (a)** Mention the classification of chromatography and draw the schematic diagram of GC with label **07**

- (b)** Write the short note on “Affinity in chromatography” **07**

OR

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