Enrollment No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous)
Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION APRIL – 2017

M. Sc. Chemistry

16PCECC09 – MODERN ANALYTICAL TECHNIQUES

Duration of Exam – 3 hrs ***Semester – II*** ***Max. Marks – 70***

***Part A** (5x2= 10 marks)*

Answer **ALL** questions

1. Which types of nuclei gives signal in NMR spectroscopy?
2. What is called a vibration in a molecule?
3. Explain Stevenson's Rule with example in mass spectroscopy.
4. Give application of flame photometry.
5. What is ee? Give formula to calculate ee value.

***Part B** (5X5 = 25 marks)*

Answer **ALL** questions

6a. Which compound is used as a reference standard in ^{1}H NMR spectroscopy? And why?

OR

6b. Discuss shielding and deshielding effects in ^{1}H NMR spectroscopy with examples.

7a. Discuss the instrumentation of flame photometry with schematic diagram.

OR

7b. Give the application of fluorimetry.

8a. What are equivalent and nonequivalent protons? Which condition methylene group's proton become non-equivalent with each other?

OR

8b. Give the application of CMR Spectroscopy.

9a. Explain non-fundamental bands in details.

OR

9b. Give the advantages of FTIR spectroscopy.

10a. Discuss Mclafferty rearrangement with suitable example.

OR

10b. Discuss simple cleavage in mass spectroscopy.

Part C (5X7 = 35 marks)

Answer **ALL** questions

11a. Explain the instrument of Mass spectroscopy with schematic diagram.

OR

11b. Discuss Chemical ionization and Electron ionization technique in mass spectroscopy.

12a. Discuss the term Chemical shift in detail in ^{1}H NMR.

OR

12b. Explain α-, β- and γ -Effects in CMR spectroscopy.

13a. Which types of burner used in flame photometry? Discuss in details.

OR

13b. Discuss the instrumentation of Emission spectroscopy.

14a. Write a brief note on Polarimetry.

OR

14b. Explain Spin-Spin splitting in NMR Spectroscopy with suitable examples.

15a. Discuss instrumentation of IR spectroscopy with schematic diagram.

OR

15b. Explain fundamental bands in IR spectroscopy.