Enrollment No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous), Rajkot

Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION NOVEMBER - 2017

M.Sc. Industrial Chemistry

16PICCC13 – INSTRUMENTAL TECHNIQUES OF ANALYSIS

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

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

Answer **ALL** questions

1. Explain monochromator (dispersing device) in UV-Viz spectroscopy.
2. Describe the phenomena of IR spectroscopy.
3. Discuss metastable ion peak in mass spectrum.
4. Give the ^{1}H NMR shift of Ethanol.
5. Discuss stationary phases used in chromatographic technique.

Part B ***(5x5= 25 marks)***

Answer **ALL** questions

6a. Describe Conjugation system in UV spectroscopy.

OR

6b. Discuss various electronic transition occurs in UV.

7a. Draw schematic diagram of IR and discuss source of radiation.

OR

7b. Discuss various detector used in IR.

8a. Explain nitrogen rule in Mass spectrometer with appropriate example.

OR

8b. Write a short note on chemical ionization (CI) technique and discuss its advantages.

9a. Enlist various solvent used for NMR. Discuss any four in detail.

OR

9b. Draw schematic diagram of NMR and discuss sample probe and magnets in detail.

10a. Write a short note on split and splitless injection system.

OR

10b. Explain in detail. Characteristics features of HPLC.

***Part C** (5x7= 35 marks)*

Answer **ALL** questions

11a. Draw schematic diagram of UV spectrophotometer. Discuss each detector in detail.

OR

11b. Discuss source of light and monochromator of UV.

12a. Explain factors affecting to IR values of Carbonyl group.

OR

12b. Distinguish following pairs of isomers using IR frequencies.

i) Three isomers of Xylene ii) Benzyl alcohol and Anisol

13a. Write a detailed note on instrumentation of Mass spectrometer.

OR

13b. Explain following fragmentation pattern in Mass spectrometer.

i) Retro Diels alder reaction

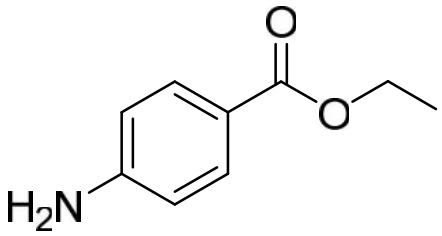
ii) Hydrogen transfer rearrangement

iii) Mcclafferty rearrangement

14a. Discuss application of NMR with example.

OR

14b. Elucidate the IR, Mass ^{1}H and ^{13}C NMR spectroscopic data of the following compound.



15a. Explain in detail. Flame Ionization Detector (FID) and discuss its advantages.

OR

15b. Write detailed note on instrumentation for HPLC.