[2½ Hours] [Total Marks : 60]

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory
      2. Figures to the right indicate full marks

Q.1 (A) Attempt Any Two of the following:

1) What is 2DFTNMR? Give its classification.
2) Discuss Heteronuclear Single quantum Correlation Spectroscopy.
3) What is Flipping? Give a brief account of Flipping of proton.
4) Describe the different types of relaxation processes.

(B) Distinguish between NMR and MRI.

OR

(B) Write an informative note on Total correlation Spectroscopy (TOCSY).

Q.2 (A) Attempt Any Two of the following:

1) Write a note on theoretical aspects of Mass spectrometry.
2) Explain the fragmentation of Methyl Cyclopentane and Cyclohexane.
3) What is the analytical information derived from mass spectra with reference to metastable peaks.
4) Describe the mechanism of Raman Spectroscopy.

(B) Explain the basic principle of Surface enhanced Raman Scattering.

OR

(B) Give the applications of Raman Spectroscopy.

Q.3 (A) Attempt Any Two of the following:

1) Give a brief account of Neutron Activation Analysis.
2) What are radiometric methods of analysis? Illustrate your answer giving suitable examples.
3) Explain Evolved Gas Analysis with respect to TG-FTIR.
4) Outline the types of Radiometric titrations.

(B) Describe the working of TG-MS.

OR

(B) What is TG-DTA? Draw neat labelled diagram of the instrument used and explain the main components of it.
Q.4 (A) Attempt Any Two of the following: (08)

1) Explain the interfaces used in GC-MS.
2) How is GC coupled with IR?
3) Give the principle and working of MS-MS
4) Draw neat-labelled diagram of GC-MS.

(B) Give the applications of GC-IR. (04)

OR

(B) Write a note on CE-MS. (04)

Q.5 Attempt Any Four of the following: (12)

1) Why is Tetramethyl Silane used as Internal Standard in NMR Spectroscopy?
2) Explain the role of electronegative atoms in downfield Shift with suitable example.
3) What is the function of Chemical Ionisation Sources?
4) Give the Schematic diagram of Raman Spectrometer.
5) What are the applications of TG-DTA?
6) Explain the principle of TG-DSC.
7) What are the advantages of MS-MS over MS?
8) Give the applications of ICP-MS.