

[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:

(08)

- 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.

(04)

OR

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

(04)

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

(08)

- 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.

(04)

OR

(B) Give the applications of Raman Spectroscopy.

(04)

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

(08)

- 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.

(04)

OR

(B) What is TG-DTA? Draw neat labelled diagram of the instrument used and explain the main components of it.

(04)

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.