Roll No.						1

Total No. of Pages: 02

Total No. of Questions: 11

Master of Science (Chemistry)(Sem. – 1)

SPECTROSCOPY - I

Subject Code: CHL404-18

M Code: 75116

Date of Examination : 17-01-23

Time: 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains EIGHT questions carrying FIVE marks each and students have to attempt any SIX questions.
- 3. SECTION-C is COMPULSORY consisting of TWO questions with internal choicecarrying TEN marks each.

SECTION-A

- 1. Write short notes on the following:
 - a) What is chemical shift?
 - b) Explain the selection rule for *IR* active molecules.
 - c) Why do nuclei such as ¹⁶O which don't possess nuclear spin don't show NMR spectrum?
 - d) What is the bathochromic shift and what factors are responsible for this?
 - e) What is nitrogen rule?
 - f) What is broad band coupling?
 - g) Explain the limitation of Lambert Beer's law.
 - h) What is the difference between ¹³CNMR and proton NMR?
 - i) Explain the selection rule for IR spectroscopy.
 - j) What is proton decoupling?

SECTION-B

- 2. What are the applications of IR spectroscopy?
- 3. Explain the electronic transitions in Uv-visible spectroscopy.
- 4. What is Ion analysis methods?
- 5. Explain the AB_2 and AX_2 first and second order species.
- 6. Explain the fragmentation pattern in ketones.
- 7. Explain difference between COSY and NOESY.
- 8. Explain the proton decoupling.
- 9. How are the ions produced in the ionization chamber accelerated?

SECTION-C

10. Explain the spin-spin coupling in NMR.

OR

Discussion of the fragmentation pattern of aldehyde and esters.

11. Discuss the IR spectrum of amines and amides.

OR

Explain the Woodward fisher rules or conjugated dienes? Explain with examples.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.