Roll No.	
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Total No. of Pages: 02

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B.Sc. (CS) (Sem. - 4)

ATOMIC MOLECULAR & SPECTROSCOPY

Subject Code: BCS-403

M Code: 72319

Date of Examination: 17-12-2022

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

SECTION-A

- 1. Write briefly:
 - a) Distinguish between normal and anomalous Zeeman effects.
 - b) Define and write the expression for Rydberg constant.
 - c) Explain the spectrum of Helium atom.
 - d) What is Lamb shift?
 - e) Write Balmer series of Hydrogen atom.
 - f) Write advantages of a four-level laser scheme over a three-level laser scheme.
 - g) What is a resonator cavity?
 - h) What do you mean by stimulated emission?
 - i) Define Laser.
 - j) Which type of pumping is used in Ruby laser?

SECTION-B

- 2. State Bohr''s postulates and deduce an expression for the allowed energies of the hydrogen atom.
- 3. Deduce Pauli's exclusion principle. What is its physical significance?

- 4. Describe and explain different types of couplings in atoms. Give illustrative examples.
- 5. Discuss possible transitions between two energy levels of an atomic system and deduce the expressions for Einstein coefficients.
- 6. Explain working principle and energy level of Nd:YAG with the help of diagram.
- 7. What are the necessary conditions for achieving the laser action?

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.