Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

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B.Sc. (Computer Science) (Sem.–4)
ATOMIC MOLECULAR & SPECTROSCOPY
Subject Code : BCS-403
M.Code : 72319
Date of Examination : 11-07-22

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION 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 a student has to attempt any FOUR questions.**

SECTION-A

1.   **Answer briefly :**

   a)   Explain the term atomic spectra.

   b)   Define Balmer series.

   c)   What is normal Zeeman effect?

   d)   Do $2^2S_{1/2}$ and $2^2Pi/2$ states of hydrogen atom have same energy? Explain your answer.

   e)   What is the importance of Lamb Shift?

   f)   Explain stimulated emission.

   g)   What are the components of Laser?

   h)   Which is more efficient three level or four level lasers. Explain your answer

   i)   Write properties of Laser.

   j)   Define Holography.

SECTION B

2. Describe Stern-Garlach experiment. Discuss how it explained space quantisation and electron spin.

3. What is L-S coupling? Give the selection rules for L-S coupling scheme.

4. How does the spin-orbit interaction when combined with the relativity correction, explain the hydrogen fine structure?

5. Discuss the kinetics of optical abortion and hence derive Fauchber Ledenberg formula.

6. Discuss with suitable diagrams, the principle, construction, working and theory of Nd:YAG laser.

7. Specify three possible types of transitions between two atomic energy levels and derive relations between Einstein's coefficients.

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